DOCTOR OF PHILOSOPHY

Environmental impact assessment in the forest sector of Great Britain.

Gray, Ian Munro

Award date:
2001

Awarding institution:
Bangor University

ENVIRONMENTAL IMPACT ASSESSMENT IN THE FOREST SECTOR OF GREAT BRITAIN

IAN MUNRO GRAY

A thesis presented for the degree of Doctor of Philosophy, University of Wales, Bangor, 2001.

This summary sheet should be completed by the candidate after having read the notes overleaf. The completed sheet should be submitted by the candidate to his/her Head of Department/School together with two copies of the thesis, two copies of the Notice of Candidature form and a certificate regarding financial obligations/matriculation.

Candidate's Surname ..... Gray
Candidate's Forenames ..... Ian Munro
Institution/College at which study pursued: University of Wales, Bangor

Candidate for the Degree of ..... PhD ..... (MPhil *or* PhD)

Full title of thesis ..... Environmental Impact Assessment in the Forest Sector of Great Britain

Summary:

Environmental impact assessment has been in use within the British forest sector since 1988 when the Environmental Assessment (Afforestation) Regulations became effective. In Great Britain between 1988 and 1998 a total of 211 applications for grant assistance for afforestation proposals have been subject to environmental impact assessment. Of these 101 had been completed by 1998 and the assessment concluded. This research details the development of environmental impact assessment in international, national and forest sector contexts, and presents a review procedure tailored for use in the British forest sector. Using this procedure, 89 forest sector environmental statements were reviewed. The review highlights the overall poor quality of environmental impact assessments and environmental statements within the British forest sector. The research investigates the efficacy of the Forestry Commission's screening process and its ability to identify projects with potential impacts through the development of a screening protocol for use in the British forest sector, which was used by Forest Commission staff to screen a series of case studies. The survey, prediction and assessment techniques employed within forest sector environmental impact assessments are analysed. For a sample of assessments where adequate baseline information was included in the original assessment, a practical audit of impact predictions was carried out, where the actual outcomes of predicted impacts were compared with information derived from field investigation.

CONTENTS

ACKNOWLEDGEMENTS

I would like to thank my supervisor, Professor Gareth Edwards-Jones for his advice and assistance throughout this study.

I wish to express my gratitude to the Scottish Forestry Trust for providing funding for this research. I would also like to thank the Forestry Commission, in particular Mr Douglas Wright and Mr Keith Wishart for their interest, expertise and comments, and allowing access to the considerable Forestry Commission archives. Thanks are also due to individuals and organisations that participated in the research and gave permission for fieldwork.

Finally I wish to thank my parents May and Alex for their help in getting me this far and in particular my father's diligent proof reading of the final text, and my wife Trish, for her patience, support and encouragement throughout.

ABBREVIATIONS

ADB	Asian Development Bank
AGLV	area of great landscape value
AONB	area of outstanding natural beauty
CA	competent authority
CBA	cost-benefit analysis
CBI	Confederation of British Industry
CEC	Commission of the European Communities
CEEA	Canadian Environmental Assessment Agency
CEQ	Council on Environmental Quality
CJEC	Court of Justice of the European Communities
DETR	Department of Environment, Transport and the Regions
DfID	Department for International Development
DoE	Department of the Environment
DoT	Department of Transport
EA	environmental assessment
EARP	Environmental Assessment Review Process
EC	European Community
EEA	European Economic Area
EIA	environmental impact assessment
EIS	environmental impact statement
EPA	Environmental Protection Agency
ES	environmental statement
ESRP	Environmental Statement Review Process
ESA	environmentally sensitive area
FA	Forest Authority
FC	Forestry Commission
FDM	Forest District Manager
FE	Forest Enterprise
FEARO	*Federal Environmental Assessment Review Organisation*
FIC	Forest Industry Committee
FONSI	finding of no significant impact
FSC	Forest Stewardship Council
FTE	full time equivalent
ha	hectares
IEA	Institute of Environmental Assessment
IEE	initial environmental evaluation
IFS	indicative forestry strategy
IIED	International Institute for Environment and Development
IUCN	The World Conservation Union
km	kilometre
LPA	local planning authority
MIRENEM	Ministerio de Recursos Naturales
NGO	non-governmental organisation
NNR	national nature reserve
NSA	national scenic area
NEPA	National Environmental Protection Act (1969)
ODA	Overseas Development Administration
OECD	Organisation for Economic Cooperation and Development
RAC	Regional Advisory Committee
RSPB	Royal Society for the Protection of Birds
SAC	special area of conservation
SDD	Scottish Development Department
SEA	strategic environmental assessment
SEPA	Scottish Environmental Protection Agency
SIA	social impact assessment
SNH	Scottish Natural Heritage
SoS	Secretary of State

SOAEFD	Scottish Office Agriculture, Environment and Fisheries Department
SPA	special protection area
SSSI	site of special scientific interest
T&CPA	Town & Country Planning Act (1947)
UK	United Kingdom
UKWASSG	United Kingdom Woodland Assurance Scheme Steering Group
UNCED	United Nations Conference on the Environment and Development
UNEP	United Nations Environment Programme
USA	United States of America
USAID	United States Agency for International Development
USFS	United States Forest Service
WGS	Woodland Grant Scheme

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1 INTRODUCTION

1.1 Background to the research

Environmental impact assessment (EIA) is a relatively modern addition to the range of tools available to the decision-maker. Initially developed in North America in the late 1960s, it has since, proven to be a useful addition to the decision making process (Wathern, 1988, Fortlage, 1990, Harvey, 1998, Harrop and Nixon, 1999). At the heart of environmental impact assessment is the premise that potentially harmful effects of new developments can be averted if full information on the consequences of the project is collected and introduced into the decision making process at the correct time, and presented to decision makers in a format which is expedient for that particular decision (Glasson, Therivel and Chadwick, 1999, Lee, 2000). By having access to this information, which otherwise would not have been taken into account in the decision making process, decision makers can base a judgement on a fuller presentation of information, and hopefully this will result in improved decision making. With a fuller understanding of the consequences of a project decision-makers can then decide whether the potential benefits of a project outweigh any potential environmental damage which would occur were the project to proceed. Conversely, the loss of environmental value may be considered too high a price to pay for the social or economic benefits derived from the project and it may be decided that the project should therefore not be allowed to proceed.

In addition, the process of environmental impact assessment can be used within the project planning cycle to improve project design (Gilpin, 1995). Environmental impact assessment can be used to highlight areas of the project which are particularly damaging to the environment, or, elements of the environment which are particularly vulnerable to damage or notable through rarity or location. If carried out early enough in the planning process changes can be made to project design, location or methods of working. Such methods of mitigation can therefore be introduced to a project which at the outset was considered to result in unacceptable environmental damage, and remove or reduce the level of environmental damage to an acceptable level. Similarly, environmental impact assessment can be used to identify potential positive benefits of the project and allow modifications to be introduced which could enhance or broaden the distribution of these positive impacts. Therefore the success of environmental impact assessment depends upon the timely introduction of pertinent information into the decision making process. Obviously anything but a complete, competent and unbiased assessment presented in a comprehensible manner may lead to information of a poor standard being available to the decision-makers, increasing the probability of a sub-optimal decision being made.

During the 1970s environmental impact assessment was used to a limited extent in the UK, mainly in the oil industry (OECD, 1979, Turnbull, 1984). It was not until 1988 that environmental impact assessment became widely used in the UK when the Government endorsed the use of environmental impact assessment as an aid to decision making. This was the result of the European Community Directive 85/337/EEC that required member states to provide legislation which would require development projects with potentially adverse environmental impacts to be subject to an assessment of the consequences of the project prior to implementation (CEC, 1985).

A result of the 1988 legislation was that afforestation projects presented for entry to the Woodland Grant Scheme which were considered by the Forestry Commissioners to have potentially significant adverse impacts were required to undergo an additional level of investigation. This assessment was viewed as a higher or more detailed level of examination than what was then provided by a recognised consultation procedure within the Woodland Grant Scheme process or consideration of the project by the Regional Advisory Committees (RAC) in the case of particularly contentious projects.

During the first decade after the introduction of environmental impact assessment legislation to the UK forestry sector in 1988, a total of 211 afforestation projects for which an application for entry into the Woodland Grant Scheme has been made in Great Britain, were deemed to require assessment. Of these, 101 resulted in the preparation of an environmental statement (ES) which was used in the subsequent decision making process. This level of environmental impact assessment makes the forest sector one of the most active in terms of the number of environmental impact assessments requested. It also makes the Forestry Commission one of the most experienced competent authorities (CA) in the UK. However, despite this and the fact that over a decade has lapsed since environmental impact assessment was introduced to the sector, the Forestry Commission has yet to publish detailed guidelines on the execution of environmental impact assessment or the preparation of environmental statements. In addition there has been no internal audit procedure for environmental impact assessment which would ensure that standards are maintained at a high level, consistently throughout the country. This is despite there being an established internal Forestry Commission audit procedure for the implementation of the Woodland Grant Scheme for which assessments are carried out. Similarly, no review of the quality of the statements that have been accepted by the Forestry Commission has been conducted despite similar studies being carried out in other sectors in the UK (Dancey and Lee, 1993; Jones, Wood and Dipper, 1998; Barker and Wood, 1999). There has therefore been no examination of the value of the prepared environmental statements or the usefulness of the environmental impact assessment process in providing additional information

to decision makers, to allow improved decisions to be made.

Without such an examination the potential benefits which can be derived from environmental impact assessment are easily lost from the sector by the combined dissent of the traditional pro- and anti- forestry lobbies. The lack of interest in environmental impact assessment within the pro-forestry lobby can be seen through the paucity of papers and articles on the subject in journals and magazines. One common view of environmental impact assessment amongst foresters, agents and landowners, as will be examined in Chapter 5, is that it is an additional planning hurdle that should be cleared with minimum effort, outlay of expenditure and delay to the project. There has generally been a failure within the sector to see the benefits which can be attained through introducing the process of environmental impact assessment into the planning process at an early stage. Other sectors have claimed that financial savings have been achieved through the introduction of environmental impact assessment. Reduced costs can arise from having less redrafting of proposals. Environmental impact assessment can help identify potential areas of conflict and can suggest methods to mitigate these (Glasson *et al.*, 1999, Singleton, Castle and Short, 1999). The earlier this is done in the planning cycle the easier and cheaper this tends to be. With the advent of environmental standards and forest management certification, environmental impact assessment is a mechanism through which an organisation's projects can be seen to meet prescribed environmental performance. However, within the forest sector, the use of environmental impact assessment tends to be reactionary with the aim of securing Woodland Grant Scheme funding rather than the proactive environmental protection mechanism it was intended to be.

The opposing lobby appears to have a somewhat jaded view of the worth of environmental impact assessment within the sector. One perceived opinion amongst conservation or environmental groups, examined in Chapter 5, is that the usefulness of environmental impact assessment and the environmental statements produced within the sector is rather limited. This is especially the case where these bodies are also involved in environmental impact assessments which originate in other sectors. The environmental impact assessment process is therefore seen merely as a vehicle through which an objection to a project or part of a project can be voiced. There is little expectation by the environmental lobby that environmental impact assessments produced within the sector will provide any material information that will assist the decision making process and tend to rely on the subsequent consultation process to deal with potential environmental impacts. In addition to this current state of apathy resulting from the dissatisfaction of two of the key groups, the Forestry Commission has been blighted by the general unwillingness of the UK Government to fully endorse environmental impact assessment as prescribed by the European Commission in the mid and late 1980s. Environmental impact

assessment was introduced with little internal guidance for the Forestry Commission and its personnel on the ethos of environmental impact assessment or the role which the Forestry Commission as competent authority would have to play. Within the sector, initial environmental impact assessment practice was somewhat unguided and the resultant assessments of unfortunately low quality and of limited usefulness.

Having this inauspicious start and the continued internal uncertainty over the role which the Forestry Commission should take as lead body, combined with the general unwillingness of proponents to carry out an assessment, and the pessimism of consultees that the process will lead to any tangible benefit has resulted in a stagnation of environmental impact assessment within the sector. The claims of both lobbies gain weight when one considers that of 101 environmental impact assessments completed all but one has been approved for inclusion in the Woodland Grant Scheme. Equally disconcerting is the fact that no significant adverse impacts were identified in a sample of 16 environmental statements reviewed in 1996 (Gray, 1996, Gray and Edwards-Jones, 1999). From the conclusions of these works three situations were proposed as possible explanations for these observations:

- The Forestry Commission was correctly screening the projects for assessment and that through rigorous environmental impact assessments any potential adverse impacts were satisfactorily mitigated, or;
- The Forestry Commission was calling for environmental impact assessments for projects which did not justify assessment, but the resultant environmental impact assessments were of adequate standard and indeed no significant adverse impacts would result, or;
- The Forestry Commission was correctly screening potentially damaging projects and adequately flagging potential adverse impacts, but the environmental impact assessments carried out were inadequate and did not satisfactorily assess the significance of impacts or introduce salient information into the decision making process.

Should the first argument be correct then despite the unpropitious beginnings of environmental impact assessment within the sector and the general misgivings of the major actors, the process is generally fulfilling its role, and that while it may be prudent to improve the reputation of the process in the sector it does not require a major overhaul. If the second argument is taken to be correct the standard of assessment can be assumed to be adequate but the screening mechanism of the Forestry Commission should be tightened to ensure that only the most potentially damaging projects are subject to environmental impact assessment and that no undue burden is placed on proponents of environmentally benign projects. If, however the final line of reasoning is taken to be correct, the role of the Forestry Commission as competent authority in charge of the environmental impact assessment process requires re-appraisal. The review

procedure utilised by the Forestry Commission to determine whether or not an environmental statement contains the appropriate information to allow introduction to the decision making process requires addressing and further guidance offered to proponents on required content and precision of assessment.

1.2 Aims & Objectives

The aim of this work is to investigate the current status of environmental impact assessment practice within the forest sector in Great Britain in terms of level of activity, quality of assessments carried out and the standard of the application of the process by the Forestry Commission, project proponents and consultees. This work will be the first major study of the application and quality environmental impact assessment in the British forest sector. This will promote understanding of the environmental impact assessment process by the main actors, improving future application with specific regard to refining assessment methods and advance the utility of environmental statements, leading to enhanced environmental protection and improved afforestation projects. The specific objectives of the work are:

- To describe the current situation through explaining the recent development of forest policy in Great Britain, the origins and evolution of the practice of environmental impact assessment, and the legislation currently pertaining to environmental impact assessment;

- To determine the number of forestry projects subjected to environmental impact assessment and assess the quality of the resultant environmental statements through a structured review procedure, highlighting areas of weakness and proposing methods of improvement;

- To investigate the Forestry Commission screening process in order to assess the ability to successfully identify projects with potentially significant adverse impacts, while not placing undue burden on afforestation proponents;

- To appraise the current quality of the methods of data collection and the techniques used to identify, predict and assess impacts within environmental statements;

- To identify examples of good practice within other sectors nationally and internationally, which could improve the application of environmental impact assessment within the forest sector.

1.3 Structure of the Thesis

The thesis is divided into seven chapters. However this naturally separates into three parts for the purposes of explanation:

- The presentation of background information on the nature of environmental impact assessment and the forest sector;
- A review and analysis of the levels of environmental impact assessment practice within the forest sector, and an investigation of the standards and application of techniques used within the assessment procedure to allow comparison with environmental impact assessment practice in other sectors and countries;
- The presentation of conclusions and implications.

CHAPTER 2 The History and Development of Environmental Impact Assessment gives an introduction to the subject of environmental impact assessment, by describing the assessment process and the role and features of the resultant environmental statement. The development of environmental impact assessment at the international, European, national and sector levels is then reviewed, identifying common features between systems and explaining how the existing position was reached. The standards of practice and the level of application within the forest sector are then set in context by presenting a review of current usage of environmental impact assessment internationally. This highlights examples of best practice and discusses the effect these could have on environmental impact assessment within the forest sector. CHAPTER 3 The Forest Sector in Great Britain provides the background information on the situation in which environmental impact assessment within the sector currently operates. Forest sector policy is described together with an analysis of the role of the Forestry Commission in both the development of the forest resource and as competent authority regulating the environmental impact assessment process. Internal and external Forestry Commission guidelines are discussed. Data on the number, location and extent of afforestation projects within Great Britain between 1988 and 1998 are presented as are data on environmental impact assessments called for afforestation proposals within the same period.

Within CHAPTER 4 Review of Sector Environmental Statements the role of reviewing environmental statements and its function within the whole assessment process is examined. The methods commonly employed for reviewing environmental statements are presented and discussed. A review methodology is prepared for use in this research through the adaptation of an existing, review package. The adapted review methodology is used to review 89 forest sector environmental statements and the results are presented. CHAPTER 5 The Assessment Process Within the Forest Sector, investigates the preliminary stages in the assessment process, in particular focusing on the Forestry Commission screening process. The Forestry Commission screening process is examined through the use of a series of screening case studies and a questionnaire. A screening methodology for use in the forest sector is developed and a series of four case studies prepared. The screening methodology is then used by Forestry

Commission staff and a group of students and the screening results compared. A series of three questionnaires are prepared and sent to Forestry Commission staff, forest sector consultees identified in, and the authors of, the environmental statements reviewed in Chapter 4. Responses from the three groups are examined and compared. Within CHAPTER 6 Standards of Assessment, the survey, prediction and assessment techniques employed within forest sector environmental impact assessments are analysed. For a sample of five assessments a practical audit of impact predictions is made, where the actual outcomes of predicted impacts on landscape and employment are compared with information derived from field investigation. In addition, the availability of tools and techniques for data collection and outcome prediction from other sectors and fields of study is reviewed and applied to the above sample of impacts as a parallel assessment for the purposes of comparison where critical assessment elements are missing from the original information provided in the environmental statements. This will enable discussion on whether impact prediction within the sector is limited by the availability of applicable techniques or by the dissemination of the knowledge to environmental impact assessment practitioners within the sector that such techniques exist.

The thesis closes with the discussion and formulation of a series of suggested developments and modifications for the future application of environmental impact assessment within the sector, and ends with a synopsis of the principal findings of the research in CHAPTER 7 Conclusions & Implications.

CHAPTER 2 THE HISTORY AND DEVELOPMENT OF ENVIRONMENTAL IMPACT ASSESSMENT

2.1 Introduction

This chapter introduces the topic of environmental impact assessment. It presents the reasons for the inception of environmental impact assessment in the late 1960s and discusses its development over the subsequent thirty years. The chapter has three main themes:

- The origins of environmental impact assessment;
- The project-based environmental impact assessment;
- The development and use of environmental impact assessment in an international context.

Firstly the origins of environmental impact assessment are discussed highlighting the importance of the original environmental impact assessment legislation in the USA and how this has subsequently influenced environmental impact assessment worldwide. The format and function of environmental impact assessment in the USA is explained together with the lessons which can be derived from forty years of experience of the process. The development of environmental impact assessment within the European Union is then discussed and the legislative requirements set out by the European Commission examined. The methods through which this legislation has been transposed in the UK are then explained and attention is subsequently focused on the legislation specific to the forest sector in Great Britain. The procedural requirements of the Forestry Commission are then reviewed and the various amendments to forest sector environmental impact assessment legislation introduced, concluding with a précis of the most recent legislation.

The second part of this chapter looks at the project-specific environmental impact assessment process itself. The various stages in the process are introduced and a generic framework is proposed, together with discussion of assessment techniques and examples of best practice. The most tangible output of the environmental impact assessment, the environmental statement, is then introduced and its function and format examined. The quality of environmental statements is discussed drawing on the results of the most prominent studies in recent years.

The final part of this chapter looks at the various ways in which environmental impact assessment has been developed and is being used in an international context. The legislative requirements of several environmental impact assessment processes are discussed and compared, together with the institutional role of environmental impact assessment in development projects.

2.2 Origins of Environmental Assessment

2.2.1 The Need for Environmental Assessment

Environmental impact assessment is a modern approach to decision making and planning. It is based on a simple principle of ensuring the consequences of an action are understood as fully as possible before that action is carried out. Environmental impact assessment does not furnish the decision-maker with any new methods of prediction nor is it a decision support system. All the methods of survey, prediction and analysis are available and already utilised in other circumstances (Ahmad and Sammy, 1985, Dixon, 1995, Marriott, 1997). However it should be remembered that environmental impact assessment is not a perfect process and will always contain value assumptions and be a political vehicle to some extent (Beattie, 1995). Environmental impact assessment is unique in the manner in which these techniques and methods are used together. Roche (1999) suggested that environmental impact assessment was not new and that the unnamed process had been in use for a long time. What was new was the emphasis on outcomes and consequences and the systemisation of the process.

During the past thirty years there have been a growing number of people who have identified an array of threats to the environment and natural resources through modern technology and population and economic growth (Rau, 1980). The benefits of unbridled economic and material expansion are no longer automatically accepted or seen as desirable. The preservation and protection of the environment and natural resources, the control of pollution and the maintenance of a wholesome environment in which to live together with the planned use of natural resources have become demands of an increasingly well informed and concerned society. Development and the use of resources nearly always involves conflicts of interest (Biswas and Geping, 1985). However it is widely accepted that through thorough planning and careful management of the use of natural resources it is possible to reduce natural resource consumption and environmental impact. While it may have been acceptable in the past to dismiss the loss of 'a few birds' as insignificant, similar development impacts would now be treated in a much more robust manner. Unfortunately while environmental impacts may now not be dismissed out of hand, they are commonly paid little more than lip service and are overwhelmed by one-sided economic valuation of the benefits of the development (Jain, Urban and Stacey, 1977).

Wibberley (1960) suggests that in all societies conflicts will arise between different groups and individuals as to how land and resources should be used. These will arise due to the difference of the natural capacity of land for different purposes. It is now a commonly held view that the movement of land to the best common use is not necessarily achieved through highest market price. Certain uses such as conservation or aesthetic uses are squeezed out as their market value

is low or difficult to measure (Mather, 1993). This did not concur with the political feeling that was prevalent in the late 1970s and early 1980s when environmental impact assessment was in its infancy in Britain.

The growing acceptance of the free market economy had its roots in Adam Smith's *Lectures in Jurisprudence* of 1762 which supported the right of property or land owners to make use of it as they see fit, including, should they see fit the right to abuse or destroy it (Norton, 1984). Until recently there has been the general acceptance that the ultimate goal of government policy should be continued development and economic growth. Any dissension from this line, calling for conservation of resources or a slowing down of growth, has brought criticism and claims of being backward-looking or 'Luddite' thinking. However there are indications that the quality of the environment is becoming an important issue to more than just a small group of activists or conservationists (Welford, 1996). Perhaps one of the reasons for this change has been the fact that conservation can and has many different meanings. Green (1981) highlights three different views of conservation:

- The preservation and protection of elements of the environment thought to be of amenity value
- The regulation of pollution and preservation of a healthy environment, and
- The planned use of resources to ensure their supply in perpetuity.

Green (1981) also argues that accomplishment of the third concept will lead to accomplishment of the first two. If one uses resources wisely, then the environment should be healthy and contain the requisite features. The growth in public awareness of environmental problems, the drawdown on natural resources and the deleterious effects of poorly planned development has forwarded the idea of rational resource use and protection of the natural environment. However the maintenance of the natural environment inevitably involves decisions on the allocation and management of natural resources.

Many of the industrialised countries have a long history of development conflict, industrial pollution and erosion of the environment. In the United Kingdom the Public Health Act 1848, the Alkali Works Regulation Act 1906 and the Clean Air Act in 1956 were all enacted to deal with specific environmental threats or problems such as the London smog disaster of 1952 (Gilpin, 1995). However such regulations were reactive measures brought in to remedy a situation which had started to deteriorate. O'Brien (2000) describes the slow realisation during the 1960s that technologies had surpassed understanding of potential impacts and resulting wastes and by-products were increasingly dangerous and persistent. In many cases rapid advances in technology resulted in unanticipated impacts arising from projects (Mason, Roper and Porter, 1999). During the early part of the 20th century, industrial development followed a

pattern which assumed an infinite reserve of natural resources. Market forces and local community agreement were assumed to accord sufficient safeguard to the environment. However acceptance of the liberal economic theory (Schumpeter, 1943) and the reliance on market forces to regulate resource use usually requires a perfect market. In reality however the perfect market rarely, if ever, exists due to conditions of monopoly, monopsony or imperfect knowledge of the market. More recently the policies of the 1997 Labour Government and the 'social market economy' suggest that market competitiveness can co-exist with the community, welfare and the environment, relying on the central concept of stakeholding. The information revolution currently under way opens up new audiences to environmental information and environmental issues that would otherwise have been missed. Monnikhof and Edelenbos (2001) discuss a range of means through which stakeholder ideas are now entering policy decisions from simply finding out about stakeholder demands to providing stakeholder participation in the creative process of designing solutions, to getting stakeholders involved in the bargaining process and ultimately involvement in the decision making process at many levels. This strengthening of public knowledge and public interest has provoked Governments to take action to protect the environment and recognise the environment when formulating policy. This is shown by the increase in national and international legislation for environmental protection and a growing number of Government Departments and Agencies which deal with environmental matters. The UK Government consultation paper on sustainable development (DETR, 1998a) called for an integrated way of thinking. This linked sustainable economic growth with a healthy environment that has not been left as an impoverished legacy for future generations. In particular the consultation document highlighted the need to consider costs and benefits of actions in the widest possible sense rather than pursuing particular narrow goals. This involves considering long-term effects as well as short-term ones, indirect effects as well as direct (Barnes and Barnes, 1999). While the links between environmental impact assessment and sustainable development are discussed by George (1999) and Bond, Curran, Kirkpatrick, Lee and Francis (2001) its deficiencies in terms of sustainability are highlighted by Mao and Hills (2000).

Historically as the number of environmental and social problems increased additional regulations continued to be enacted with increasing frequency through the second half of the 1900s. In the UK these provided a relatively comprehensive check on the most damaging or unsuitable of developments. While development continued at a local level this system may have been sufficient. However as populations grew internationally, the increasing scale of developments, the wider-spread possible interactions and serious deleterious effects of modern industry stretched the existing controls beyond their practical limits. The first country to initiate development of a system to bridle the modern trends in industrialisation was the USA.

2.2.2 Development of the National Environmental Policy Act in the USA

By the 1950s in the USA a growing environmental lobby had raised public awareness that natural resources in the USA, and globally, were not infinite. It was felt that some form of regulation on natural resource use would be required if extensive and irreversible environmental damage was to be avoided. As early as 1959 a bill was proposed that would have unified policy on conservation, natural resources and the environment (Andrews, 1976, Marriott, 1997). At that point the structure of federal government was such that nine major agencies were involved in activities which could contain projects with major impact on the environment and natural resources. Conflict between the agencies had also reached its nadir, as each developed to fulfill narrowing mission statements, turning introspectively rather than taking a broad view of issues. It was noted that without co-ordination between the agencies and improved (and shared) knowledge of environmental systems, a coherent environmental policy could never be achieved (Andrews, 1976). This situation had reduced public confidence in the federal government to adequately protect the environment.

Several attempts to introduce a national environmental policy were made in the early 1960s, however lobbying from powerful industrial groups meant these bills met little success. The Santa Barbara oil spill, following a major blowout on an oilrig in the Santa Barbara Channel in 1968 caused great public controversy, fortuitously for the attempt to introduce the policy in 1969. With public attention on Congress, the National Environmental Policy Act 1969 (NEPA) was passed almost unanimously and became operational on 1 January 1970. Drafted as a very strong piece of legislation, the act initially proposed that the right to a healthy environment should be given status equivalent to that accorded to free speech. This was subsequently diluted during passage through Congress to the intention that everyone should be able to enjoy a healthy environment (Jain, Urban, Stacey and Balbach, 1993). NEPA was the first environmental assessment legislation, and has subsequently been used as a model for other systems. The lessons learned from NEPA have had important consequences on how other countries developed their legislation. This merits a brief review of early experience in the USA.

NEPA consisted of three parts. The first established a national policy on the protection and restoration of environmental quality promoting sensitive use of natural, cultural and historic resources. The second part of the act was directed at the establishment of laws and regulations that forced all federal government agencies to recognise and implement the new national environmental policy in the course of all of their actions. The final part of NEPA was to establish a Presidentially appointed three member Council on Environmental Quality (CEQ) to review environmental programmes and progress, and to advise the President. In the early days of the first Clinton Administration the role of the CEQ was radically changed with most of the

CEQ's mandate being passed to the newly formed President's Council on Sustainability.

NEPA focused on major federal actions. These were categorised as actions which were likely to give rise to major effects, and that were potentially subject to federal control or federal responsibility. This included new or continuing activities of federal agencies, the adoption of federal plans, programmes and policies, and the approval of projects which received federal funding or required federal permits or licenses (Rodgers, 1976). Examples of such projects were the granting of a Federal Power Commission license to construct a major power line and, the construction of a marina by a private developer which required permission from the US Army Corps of Engineers.

The initial years of NEPA were punctuated by a series of influential court rulings following legal proceedings challenging an agency's ruling not to prepare an environmental impact assessment, the quality or adequacy of an environmental impact assessment or an agency's decision to proceed with a development following an environmental impact assessment. O'Brien (2000) provides details of challenges concerning use of chemicals in national forests of the Pacific Northwest and grazing in the Ochoco national forest in Oregon. In the first 13 years following the enactment of NEPA 70 federal agencies prepared 16000 environmental impact statements (EIS) of which 1602 were subject to legal proceedings (Gilpin, 1995). These actions, often brought by public action groups were a time-consuming and expensive proving period for the new environmental legislation. It is interesting to note that this experience has been avoided in other countries by preparing legislation with more detail than the rather loosely worded NEPA. In addition to the full-blown environmental impact statement a less rigorous secondary level of assessment, the environmental assessment (EA) has been used in the USA for projects which although still containing potentially significant effects are of a lesser nature. In the first twenty years following the enactment of NEPA over 500 000 environmental impact assessments were carried out (Burchell, 1996). Clark (2000) estimated that approximately 50,000 environmental assessments were being carried out annually in the USA.

A series of additions and improvements were made to the original legislation including strengthening the procedures in 1977 and the spread of assessment to major federal actions outside the USA in 1992 - for example development aid. With familiarity of the system, the number of environmental impact assessments submitted annually dropped in the mid-1980s to approximately 450. The ability of environmental impact assessment to identify possible impacts early in the planning phase, allowing mitigation methods to be built into schemes, thereby removing the need for a full assessment, is a major reason for this reduction.

2.2.3 NEPA Guidelines

In 1978 guidelines were published to improve the assessment process. This included a draft environmental impact statement outline, splitting the environmental impact statement into eight sections, and giving guidance on the content of each (Council for Environmental Quality, 1978):

1. A **coversheet** which should be no more than one page in length, containing:
   - A list of the responsible agencies;
   - The title of the action under consideration, the State(s) in which the action will take place and the jurisdiction under which the action falls;
   - The name and address of the lead agency which can be contacted for additional information;
   - The designation of the document – whether draft, final or supplementary in nature;
   - An abstract of the assessment, which should be no longer than one paragraph;
   - The date by which comments on the environmental impact statement should be received;
2. A **summary** not exceeding 15 pages in length fully and precisely synopsizing the full statement. In particular this should focus on particular conclusions and emphasize areas of controversy or issues which have been raised by agencies or the general public. In addition unresolved issues should be noted;
3. The **purpose** of and **need** for the project should be detailed outlining why this project is essential and is the preferred method of tackling the problem;
4. Seen as being at the heart of the environmental impact statement is the treatment and presentation of **alternatives**. Within this section each alternative is assessed in turn, the attendant impacts should be made clear in each case and the decision path taken to arrive at the selected alternative made explicit. In particular this calls for:
   - Rigorous exploration and the objective evaluation of all reasonable alternatives including a discussion of alternatives which have been eliminated from the assessment;
   - Each alternative to be considered in sufficient detail so that the relative merits of each can be considered;
   - The alternative of taking no action should be included;
   - The preferred alternative of the agency should be clearly identified;
5. The **affected environment** should be succinctly described. The Guidelines stress the point that the description should be no longer than is necessary to understand the effects of the alternatives and that the treatment of each environmental element should be commensurate with the importance of the associated impact. In particular the Guidelines argue against loquacious descriptions, highlighting the importance of concentrating effort and attention

on only the most important of issues;

6. The **environmental consequences** of the preferred alternative should be made explicit, in particular attention should be given to:
    - Direct and indirect effects;
    - Possible conflict between the project and agencies' programmes, plans and policies;
    - Mitigation of adverse impacts;
7. A **list of preparers** – those involved in the production of the assessment – should be given, but be less than 2 pages in length. Individuals should be named and associated with that part of the assessment for which they were responsible. This should include a list of the individuals' qualifications, expertise and past experience;
8. **Appendices** should be used where required. The Guidelines note that the main text of the environmental impact statement should be as succinct as possible, detailed analysis or calculations should be appended to aid understanding of the environmental impact statement as a document.

Activities which were deemed to have potentially significant impacts, but on a lesser scale were to be handled through the less complex Environmental Impact Assessment. Burchell (1996) provides an outline of the contents of an environmental impact assessment presentation:

Abstract

1. Project need
2. Description of the project
    a) What
    b) Where
    c) Degree of meeting need
3. Description of the affected area – baseline
    a) Components
    b) Interpretation
4. Impacts of the proposed project
    a) Components
    b) Interpretation
    c) Mitigation
5. Evaluation of alternatives
    a) Description of the alternatives
    b) Method of selection and result
6. Planned environmental monitoring
    a) Justification

b) Outputs/decision points

References

Glossary

List of abbreviations

Index

Appendices

2.2.4 The Spread of NEPA

While NEPA was a piece of federal legislation, targeting federal projects, the successes of its application were soon apparent. Environmental assessment was quickly transferred to private projects through the enactment of what has been referred to as 'mini-NEPAs' on a State basis. Burchell (1996) lists 18 States which had established this type of legislation, including Florida in 1970, Montana in 1971, Washington in 1974, California in 1982 and Arkansas in 1987. Following the USA lead, various forms of environmental impact assessment legislation were established throughout the world initially in developed countries but latterly also in developing countries; Canada, Australia, Indonesia and Thailand adopted legislation in 1973, 1974, 1982 and 1984 respectively (Wathern, 1988; Gilpin, 1995). Within Europe, West Germany in 1975 and France in 1976 developed environmental impact assessment legislation. By 1995 thirty-nine countries had introduced formal environmental impact assessment legislation (Gilpin, 1995). Thirty years after NEPA Harrop and Nixon (1999) estimated that 200 countries had environmental impact assessment systems. Glasson and Salvador (2000) note that systems do vary greatly in terms of procedures, practice and effectiveness.

A range of assessment techniques has been developed since the introduction of environmental impact assessment. Although not specifically mentioned in NEPA, the legislation indicated that all elements of the environment, that is, not just the physical environment, should be assessed for effect and impact. Thus the practices of Social Impact Assessment, Economic Impact Assessment, Fiscal Impact Assessment and Traffic Impact Assessment have been advanced to address particular classes of impact (Rau, 1980, Erickson, 1994). It should be noted, however, that the true ethos of environmental impact assessment is captured and only gains its full potential when all of the branches of assessment are called upon and utilised as and when necessary to create a complete assessment (Slootweg, Vanday and van Schooten, 2001).

2.3 Environmental Impact Assessment in the European Community

2.3.1 The European Community Policy on the Environment

Unlike other European Community (EC) sectors such as agriculture or transport, the EC had no community environmental policy until 15 years after the signing of the Treaty of Rome in 1957 (Johnson and Corcelle, 1989, Barnes and Barnes, 1999). The omission of what now seems to

be a fundamental part of European legislation can easily be explained by the fact that following the Second World War and the necessity to rebuild Europe the idea that the environment should be safeguarded, thereby restricting or slowing redevelopment, did not exist or was unfortunately overlooked. The 1972 Paris summit saw the birth of the Community Environmental Policy which notes that economic expansion should also give rise to an improved quality of life and out of necessity particular attention should be paid to the environment. By 1975 the EC had begun drafting environmental impact assessment legislation. The main reason for this impetus was that the EC wanted to establish a system of environmental impact assessment that would be uniform throughout the community. While West Germany and France developed their own legislation shortly after this, most member states halted research on their own legislation and focused on ensuring that the imminent EC regulations would be fully compatible with their existing laws.

The desire by the EC for uniformity had several reasons. Primarily the EC was concerned about environmental damage and was keen to see this halted. Secondly the EC hoped that uniform regulations would prevent some member states gaining unfair economic advantage by having less stringent environmental legislation attracting 'unsuitable' developments. In addition the EC acknowledged that modern pollution problems were not confined by international boundaries and the (in)action of one member state could have serious consequences for others or the whole EC (Glasson *et al.*, 1999). The passage of the EC regulations was not easy with numerous drafts and 10 years required to form a package that was broad based enough to be applicable in all member states, but sufficiently cogent to be transposed to form effective legislation. In particular the governments of France and the UK remained vehemently opposed to EC environmental impact assessment legislation on the grounds of cost, practicality and the need, arguing that they had adequate national environmental safeguards already operating. Indeed the UK had produced, on an ad-hoc basis, a number of environmental impact assessments for major projects for example those linked to the discovery of North Sea oil, and the Department of the Environment (DoE) had commissioned its own study into environmental impact assessment procedures (Catlow & Thirlwall, 1976). However, following a series of alterations and amendments which restrained the original provisions, on 27 June 1985 the legislative proposal was adopted as a Directive and finally became operational on 3 July 1988. However it had not been without considerable compromise. For example pressure from the agricultural lobby and protective Governments successfully downgraded agricultural projects from Annex I to Annex II status (Kirkwood, 1992). The Directive marked EC movement towards pro-active environmental protection. Should a project appear to have a significant effect on the environment, the basic principle of the Directive was that the developer, public or private, must provide information to the

competent public authority. They in turn must use this information when deliberating over the authorization or otherwise of the project. This was a major advantage over NEPA where this requirement applies only to federal agencies. In addition it listed the impacts which should be addressed in an environmental impact assessment. On the other hand unlike NEPA it did not require a detailed scoping phase, and required a less stringent public consultative process.

2.3.2 EC Directive 85/337/EEC

Directive 85/337/EEC (Appendix 1.1) established a framework of basic assessment principles and procedural provisions. It was written as guiding legislation under which member states were given considerable leeway as to how the tenets of the Directive were transposed into national legislation. The Directive applied to projects thought to have significant effects on the environment due to their nature, size or location. The Directive separated such projects into two categories:

- Projects subject to mandatory assessment in all cases- (Annex I of the Directive);
- Projects which do not always have significant impacts and should only be subject to assessment when the member states consider the project in question so requires- (Annex II of the Directive).

The Directive also described the information required in an environmental impact assessment (Annex III of the Directive). Member states were to ensure that the request for development consent and any information gathered to assist in the authorization process be made available to the public. In addition the public should be given the opportunity to voice their opinion prior to project initiation. While Directive 85/337/EEC was the controlling legislation over the whole EC, as with other Directives, each individual member state was responsible for setting and enacting its own regulations. This was one of the major failings of Directive 85/337/EEC. There was a wide variation in the interpretation of the Directive, leading to less stringent environmental protection in certain member states (CEC,1993).

One major difference was in the member states' implementation of the Directive. In the UK, Germany and Ireland it was enacted through the existing planning system. In France, Greece and the Netherlands it was under the umbrella of nature conservation. New specific environmental impact assessment regulations were passed in Belgium and Italy. An additional difference was the interpretation of Annex II projects where each member state sets criteria or thresholds which would qualify a project for assessment. The contrast between France where low threshold levels qualified over 1000 projects annually and Belgium with only a few dozen required assessments illustrates this point (Glasson *et al.*, 1999). In most member states the developer was responsible for carrying out or commissioning the environmental impact assessment. A variation on this was in Belgium where environmental impact assessments may

only be prepared by approved consultants.

In Spain the competent authority used information supplied by the developer to prepare the assessment. However most countries had no regulation of those who prepared environmental impact assessments or reviewed the quality of their output. Scoping and public involvement also showed variation in interpretation. Scoping was a mandatory step in the Netherlands but not in the UK. Although the Directive required public involvement some member states made a public hearing obligatory either before or after submission of the environmental impact assessment. Perhaps one of the most important stages of environmental protection is the ex-post monitoring of the impact of a project. Surprisingly only the Netherlands required mandatory monitoring of the actual impacts of an implemented project.

By the end of the 1990s, environmental impact assessment had become an international issue. The Rio Declaration on Environment and Development (UNCED, 1992a), pushed environmental impact assessment to the forefront of modern development planning, endorsing environmental impact assessment as an effective tool to prevent unnecessary environmental damage. Member states were urged to enact effective legislation and encourage the participation of all concerned citizens on issues of an environmental nature. Principle 17 noted that on a national basis environmental impact assessment should be undertaken for proposals that were likely to have significant adverse impacts on the environment and where approval for the project was subject to a decision of a competent authority. Chapter 8 of Agenda 21: Programme of action for sustainable development (UNCED, 1992b) focused on integrating environmental and development issues in decision making so that the over-riding objective was to improve or restructure decision making so that consideration of socio-economic and environmental issues was fully integrated and wider public participation is achieved.

2.4 The Development of Environmental Impact Assessment in the EC

2.4.1 Implementation by Member States

By 1991 all member states had transposed legislation relevant to Directive 85/337/EEC. Although Ireland, Germany and the UK had collectively implemented 36 pieces of legislation, most were approved later than July 1988, by which time the Directive should have been fully implemented (Gilpin, 1995). However, the number of measures affirmed is not a reliable indicator of formal compliance or effectiveness. While all member states had enacted environmental impact assessment legislation to comply with the Directive, application was variable. Belgium, Germany, Luxembourg and the Netherlands all had only partial compliance with Annex I projects. Similarly for Annex II projects coverage of categories was variable between member states. While member states such as Greece, Ireland, France and the UK had

enacted legislation covering all categories of projects within Annex II; Italy, Portugal and Spain had only partial coverage. Also within Annex II application of environmental impact assessment was markedly different between member states due to the establishment of widely differing thresholds to assist in project screening.

In 1993 the European Commission published a review of the implementation of Directive 85/337/EEC (CEC, 1993). The 1993 report identified other areas of concern relating to differences between member states' compliance with Article 5(1) which deals with the quality, extent and presentation of information within an environmental impact assessment. For example Rodriguez (1999) notes that although Spanish legislation complied with the terms of the Directive, implementation was leading to a high proportion of unsatisfactory assessments. In addition the Commission was keen to ensure that member states had made adequate provision for dissemination of this information and for consultative procedures between interested parties. Finally the Commission noted its concern over the lack of clear guidance by member states as to how the information emanating from the environmental impact assessment process and the attendant consultative process was to be exploited to best effect in the decision making process, or how corroboration of this was to be achieved. The review noted that while a minority of environmental statements submitted in the European Union were of a good standard, the overwhelming majority were below what could be considered to be an acceptable quality.

While it was acknowledged that through experience, the standard of environmental impact assessment in member states was improving there were still specific areas which required improvement:

- Scoping procedures;
- Review of environmental statements;
- Dissemination of environmental statements for consultation and study;
- Consultation procedures and public involvement;
- Inefficient use of the information arising from environmental impact assessments in the decision making process.

2.4.2 Changes in European Legislation – Directive 97/11/EC

The European Commission found it necessary to pass amending legislation to clarify, supplement and improve the assessment procedure and ensure application of environmental impact assessment was equable throughout the Community. This was accomplished on 3 March 1997 within Directive 97/11/EC amending Directive 85/337/EEC. The main features of this Directive were:

- The requirement that member states adopt measures that subject projects, which have potentially significant effects, to a requirement for development consent, and that they are subsequently assessed. This closed the loop-hole by which projects which were not subject to planning permission were exempt from environmental impact assessment;
- The lists of Annex I &II projects were revised. For Annex II projects member states were required to screen projects through case-by-case examination and/or by setting thresholds. Annex III lists screening criteria such as project characteristics, project location and characteristics of potential impact. Member states were required to ensure that screening determinations by competent authorities were made available to the public;
- The information to be provided in an environmental impact assessment was revised in Annex IV. The inclusion of consideration of the environmental impacts of any alternatives and the reason for selecting the proposed project was made mandatory. In cases where developers request before making an application, competent authorities were to provide an opinion on the likely information required for an environmental impact assessment;
- The consultation process was strengthened requiring consultees to be given the opportunity to comment on both the assessment and the request for development consent. Such comments had to be taken into consideration in the decision making process;
- Procedures pursuant to transboundary impacts were strengthened;
- Notification of the decision to grant or refuse consent were to be made available to the public and were to include the reason for the decision and where necessary the mitigation measures that were to be employed.

Member states were required to comply with the Directive by 14 March 1999. The Directive also provided for a review to be carried out five years after it came into force with the aim of ensuring further coordination.

2.5 Environmental Impact Assessment Legislation in the UK

2.5.1 The Debate Over the Need for Environmental Impact Assessment

By the late 1960s the increased scale and possible adverse consequences of modern developments had outstripped the Town & Country Planning Act and its various amendments' ability to adequately respect the interests of both the developers and the environment. Increasing access to the media allowed a groundswell of public concern to be raised over the UK Government's policy on developing North Sea oil, improving transport networks and the nuclear industry. It was in this climate that the first environmental impact assessments in the UK were carried out, mainly for oil and gas developments (Glasson *et al.*, 1999) and the DoE and the Scottish Development Department (SDD) commissioned research into environmental impact assessment procedures.

Initially there was considerable opposition in the UK to the acceptance of Directive 85/337/EEC. Atkinson and Ainsworth (1992) noted two schools of thought that consideration of environmental matters had always been part of the UK planning system, or alternatively their real importance was only recognised since environmental impact assessment legislation was introduced. The former view was typified by the stance taken by Conservative MEP for north east Scotland James Provan (CEC, 1982). Provan argued that taking the step of moving from a system which had no development control for agriculture and forestry, as far as environmental impact assessment was concerned, to one which placed agriculture and forestry on a par with heavy industry was unnecessary. Provan continued to argue that ensuring these sectors flourish was all that was required to maintain a healthy rural environment, and that another layer of planning bureaucracy was needless and would only harm an arrangement that was presently working perfectly adequately. This opposition was also held by the DoE who maintained that the existing controls within the land use planning system, the Town and Country Planning Act, adequately upheld environmental concerns by requiring local planning authorities (LPAs) to examine potential developments. As part of this examination, environmentally harmful developments could be denied planning permission or altered in order that they would constitute a lesser threat to the environment since most types of development required individual planning permission. However activities such as forestry and agriculture had never been included in planning regulations. Clark (1988) suggested that a change in the planning system which would include them would have been outside mainstream political thinking, and that a fear of outside control over the agricultural industries was one of the main reasons that the UK Government had been opposed to European environmental impact assessment legislation. However there was growing dissent originating in the late 1970s (Shoard, 1980) that there had been an official failure to adequately cope with landscape and environmental implications arising from the burgeoning agriculture and forestry sectors.

The Royal Institution of Chartered Surveyors (RICS, 1982) urged the case for controlled forestry expansion, maintaining that it was essential for the public to feel confident that afforestation was being carried out in a responsible and sensitive manner. The RICS did however argue against forestry being brought under the jurisdiction of planning control, and the use of environmental impact assessment in the sector. The RICS rejected the claim that planning control would be able to reject improper afforestation schemes due to the fact that there very few non grant aided schemes and therefore the majority would be required to be of an acceptable standard to gain approval for financial assistance under the Dedication Schemes. The additional effort to catch the limited number of schemes was not thought to be worthwhile. While acknowledging the importance of understanding the environmental effects of afforestation prior to project initiation, the RICS claimed this was normally carried out as part

of pre-project planning and consultation during the Forestry Commission application process. The RICS conclusion was that existing procedures, although in need of improvement, were adequate and also there would be very few forestry projects in Great Britain where a formal environmental impact assessment would be justified. While the UK Government's attitude to environmental impact assessment was at best cool, and the Confederation of British Industry (CBI) maintained an oppositive stance, some of the UK's largest industrial organizations actively embraced environmental impact assessment and implemented procedures in their planning operations. Rather than suggesting unnecessary expense and delay to development proposals British Gas, The National Coal Board and Shell were among those who produced increasingly detailed assessments, claiming early identification of necessary mitigatory additions regularly saved considerable sums of money (Wathern 1988).

2.5.2 Implementing Directive 85/337/EEC in the UK

The UK environmental impact assessment regulations are transposed through twenty different sets of legislation most of which were covered by the Town and Country Planning (Assessment of Environmental Effects) Regulations 1988 (HMG, 1988a) for which the competent agency is the local planning authority (LPA). Glasson (1999) comments that one of the main weaknesses of environmental impact assessment in the UK arises from confusion over the multiple systems involved. Other classes of project such as roads, electricity and pipe-line works and afforestation projects which would previously been regulated by an agency other than the LPA were treated in separate legislation. For example the Forestry Commission remains the competent agency for afforestation projects. Most developments in Scotland were covered by the separate Environmental Assessment (Scotland) Regulations 1988 (HMG, 1988b). Under the Town and Country Planning Regulations environmental impact assessments were required to be carried out for two types of project, contained in Schedules 1 & 2. These were generally in accordance with Annexes I & II of EC 85/337/EEC and carry mandatory and discretionary requirements respectively. Within Schedule 2, an environmental impact assessment was required if the project was perceived likely to result in significant environmental effects. The DoE (1988) and later the DETR (2000) described the main criteria for assessing significance were whether the project:

- Was of more than local importance, mainly in terms of physical scale;
- Was situated in a particularly sensitive location, for example a designated site, and for that reason may have significant effects even though the project is not on a major scale;
- Was thought likely to give rise to particularly complex or adverse effects.

Various indicative thresholds were set for certain types of project over which a project would be called for assessment, based project characteristics, for example, on area of the development or

facility processing capacity.

2.5.3 Changes Due to Directive 97/11/EC

Responding to the Directive 97/11/EC the UK Government engaged in a process of consultation before bringing out a new series of environmental impact assessment regulations in 1998. While the Directive 97/11/EC brought no fundamental change to the existing systems originally implemented in 1988, the Government took the opportunity to consolidate Town & Country Planning environmental impact assessment regulations and make a number of amendments to ensure full implementation of the EC Directive. The main changes arising from the Directive were the type of projects to which the regulations apply (listing on Schedule 1 or 2) and the procedures set out in the regulations regarding the initiation of the assessment process.

The procedural changes required on screening by the Directive offered three methods of compliance by screening projects using thresholds or criteria to trigger assessment, or through a case by case consideration of each project. The third option was a combination of the first two methods. A case by case consideration of every project is the most flexible approach. While this method is most responsive to the different types of projects and the situations in which they are proposed, it places a heavy burden on the various competent authorities. The approach initiated with the 1988 legislation was a case by case consideration of projects using non-binding indicative thresholds. Although a useful start to the screening process, if treated as rigid rules rather than guidance, this approach can cause problems with competent authorities and proponents seeing the indicative thresholds as cut-off points. The potential for over- or under-screening is therefore apparent. The setting of fixed thresholds which trigger environmental impact assessment can be seen as contrary to the spirit of the EC Directive and the ethos of environmental impact assessment. Although it is clear which projects cross the threshold and therefore require assessment, in practice it would be impossible to set thresholds which would be meaningful when applied to the many variations in project and site characteristics. The potential for unnecessary assessments and missed potentially significant projects is again apparent and has subsequently been subject to legal action (CJEC, 1998 and 1999).

The UK Government eventually opted to establish a series of lower level criteria above which projects were required to be scrutinised for environmental impact assessment. This system therefore maintained the case by case consideration of projects, complementing it with exclusive thresholds below which projects could normally be screened out of the assessment process. This allows attention to be focused on those projects with potentially more impact. In addition the UK Government drew up a list of sensitive areas within which the exclusive criteria would not apply and all projects in these areas must be subject to individual

consideration of the need for environmental impact assessment. Directive 97/11/EC required that a proponent must have the option of obtaining from the competent authority an opinion on the structure of the assessment and what information should be included in the environmental statement. The competent authority was obliged to discuss this with the consultees before giving its opinion. The Directive provided that this process could be made mandatory. Under the 1988 regulations the competent authority was under no obligation to participate in the pre assessment consultation although they generally did. This was also the case for proponents. The UK Government decided not to make the inclusion of a formal scoping exercise mandatory citing its reasons as potential delays and additional costs for proponents, potential discouragement of best practice and a limiting of flexibility. A competent authority was required to participate in pre-assessment consultation if requested by the proponent. Guidelines were also re-issued DETR (2000).

2.5.4 Changes Due to Devolution

Devolution in 1999 caused further revision of the UK environmental impact assessment legislation. The latest suite of environmental impact assessment regulations (HMG, 1999a, The Scottish Executive, 1999a) came into force on 1 August 1999. The 1999 Regulations implemented the changes made by Directive 97/11/EC and revoked and re-enacted the environmental impact assessment regulations of 1988, 1994 and 1997. The main amendments contained within the 1999 Regulations were to increase the number of categories of project subject to environmental impact assessment in line with Directive 97/11/EC and detail thresholds which could be used for screening projects. Additional information was provided by the Scottish Executive through a planning circular (Scottish Executive, 1999c). The Regulations also afforded the provision of a screening opinion (or screening direction in the case of the Scottish Ministers) where the competent authority gives an opinion on whether or not an environmental impact assessment will be required. In addition the Regulations set out procedures for a scoping opinion (or direction) where the competent authority gives advice on the content of an environmental statement. The Regulations also set out procedures for consulting other member states on projects which are likely to have significant environmental effects in their territories.

2.5.5 The Level of Environmental Impact Assessment Activity in the UK

Within the UK as a whole the exact number of environmental impact assessments which have been completed is not known with accuracy. Glasson *et al.* (1994) suggest that between 1300 and 1500 assessments were carried out in the first 54 months after the implementation of Directive 85/337/EEC. Jones and Bull (1997) in an analysis of published environmental statements between 1988 and 1994 identified a total of 1829 within the UK. The uncertainty

arises from the decentralized responsibility for administration of the assessment process between various sectors. Glasson *et al.* (1994) continue to suggest that the number of environmental statements prepared had risen from less than 200 in the first year to approximately 400 by 1992. Of these 75% were called in England, 15% in Scotland and 10% in Wales. These figures would give rise to an estimate of between 289 and 333 assessments being carried out annually based on 1992 figures. Focusing on Scotland this would suggest that between 43 and 50 assessments are being carried out annually. Figures from The Scottish Office (1998) suggest that this is an over estimate. Glasson (1999) provides another estimate of 350 environmental statements being produced annually in his review of the first ten years of environmental impact assessment in the UK. The Scottish Office Environmental Statistics gives the number of environmental statements sent to the Secretary of State under planning legislation up to 30 September 1997 as 271. Figure 1 illustrates the types of project for which these were prepared.

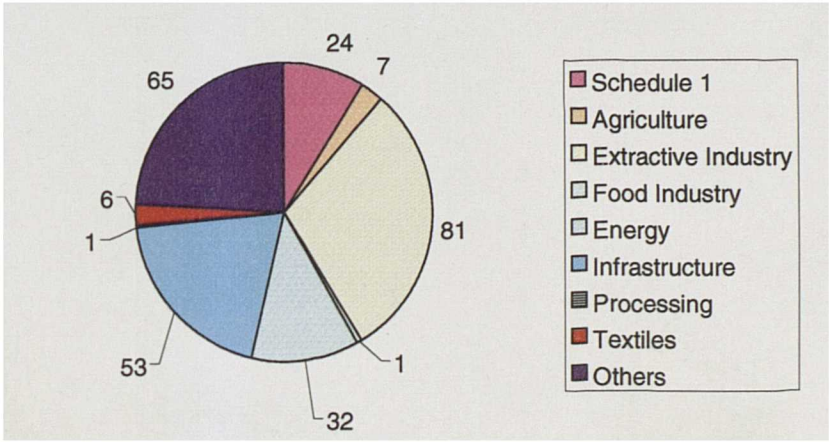


Figure 1. Environmental statements received by the Secretary of State for Scotland under planning legislation up to 30 September 1997 (Scottish Office, 1998).

2.6 The Forest Sector and EIA

2.6.1 The UK Forestry Environmental Impact Assessment Regulations

The UK complied with Directive 85/337/EEC by passing on 12 July 1988, The Environmental Assessment (Afforestation) Regulations 1988 (HMG, 1988c) which were to apply in any case where an application for an afforestation grant or loan was received by the Forestry Commission. While the 1988 legislation has been superceded in 1998 (HMG, 1998) and 1999 it is worthy of some commentary as all the environmental statements reviewed in Chapter 4 were prepared under the requirements of the 1988 legislation.

2.6.2 The 1988 Regulations

The 1988 regulations (Appendix 1.2) were designed to fit in with, and augment, the existing Forestry Commission procedures applied throughout the UK. However responsibility was

divided between the Minister of Agriculture, Fisheries and Food in England and the Secretaries of State (SoS) for Wales and Scotland. This was similar to the division of responsibility for general forestry matters in each of the countries, with the Secretary of State for Scotland being the senior forestry Minister. The regulations stated that the Forestry Commissioners should not make any grant or loan for an afforestation project where in their opinion the project would be likely to have significant adverse effects on the environment because of its nature, size or location, unless they had first taken into consideration environmental information about the project. The regulations further stated that before applying for an afforestation grant or loan a prospective applicant could make a written request to the Forestry Commission for a decision on whether that particular afforestation project would require environmental assessment. The Forestry Commission then had four weeks in which to notify the applicant that the project would not require assessment or that insufficient information had been included with the application with which to make a decision and supplementary details (described in writing) were now requested. Alternatively the Forestry Commission could notify the proponent that the project would require assessment and give the reasons for reaching this decision.

Where the Forestry Commission expressed the opinion that assessment would be required, the applicant could submit in writing for a Ministerial decision. Similarly, where the Forestry Commission received an application for an afforestation grant for which no environmental statement was supplied, but the Forestry Commission considered it necessary to have additional environmental information with which to make a decision, the Forestry Commission had four weeks to notify the applicant of this requirement stating the reasons for the request. The applicant then had a further four weeks in which to notify the Forestry Commission that their opinion was acceptable and that an environmental statement would be provided, or that the request for an environmental statement was contested and that Ministerial direction would be sought. In cases forwarded for Ministerial direction, a period of four weeks was permitted for the Minister to reach a decision, or request further information. Where the Minister directed that consideration of environmental information was required and an environmental statement should be submitted, the reasons for this request were to be stated. The Minister could also direct the Forestry Commission to request an environmental statement in any case where they had previously decided to the contrary. The responsibility of preparing and financing the environmental impact assessment however lay with the applicant.

On the decision that an environmental impact assessment was required for a particular project, the Forestry Commission were to notify the Nature Conservancy Council, in England the Countryside Commission, and in Scotland the Countryside Commission for Scotland and the local planning authority together with any other public authority or statutory body which

appears to have an interest in the project under consideration. The regulations required that these bodies gave the applicant any information they held which would assist in the assessment. If necessary a fee could be charged for provision of any information. These organizations could in turn ask for more information on the project which the applicant was obliged to provide.

Following submission of the environmental statement the Forestry Commission would consider the quality and completeness of the assessment and inform the applicant whether the environmental statement was acceptable, or required additional information or strengthening. If necessary the Forestry Commission would give direction on the amendments required to make the environmental statement acceptable. Once the Forestry Commission considered the assessment and environmental statement to be of an acceptable standard the regulations required that the applicant placed advertisements in two local newspapers giving notice of the intended afforestation project and notifying members of the public that representations regarding the project should be made in writing to the Forestry Commission within 28 days. The applicant was also to make copies of the completed environmental statement available to the public for inspection for a period of 21 days and make available copies of the environmental statement which could be purchased at a reasonable cost. The consultees then received copies of the environmental statement and were permitted four weeks within which to submit comments. Following this consultation period the Forestry Commission would consider the application for grant aid in the usual procedure, the applicant would be notified of the decision, and the decision of the Forestry Commission would be publicised. This process is summarised in Figure 2.

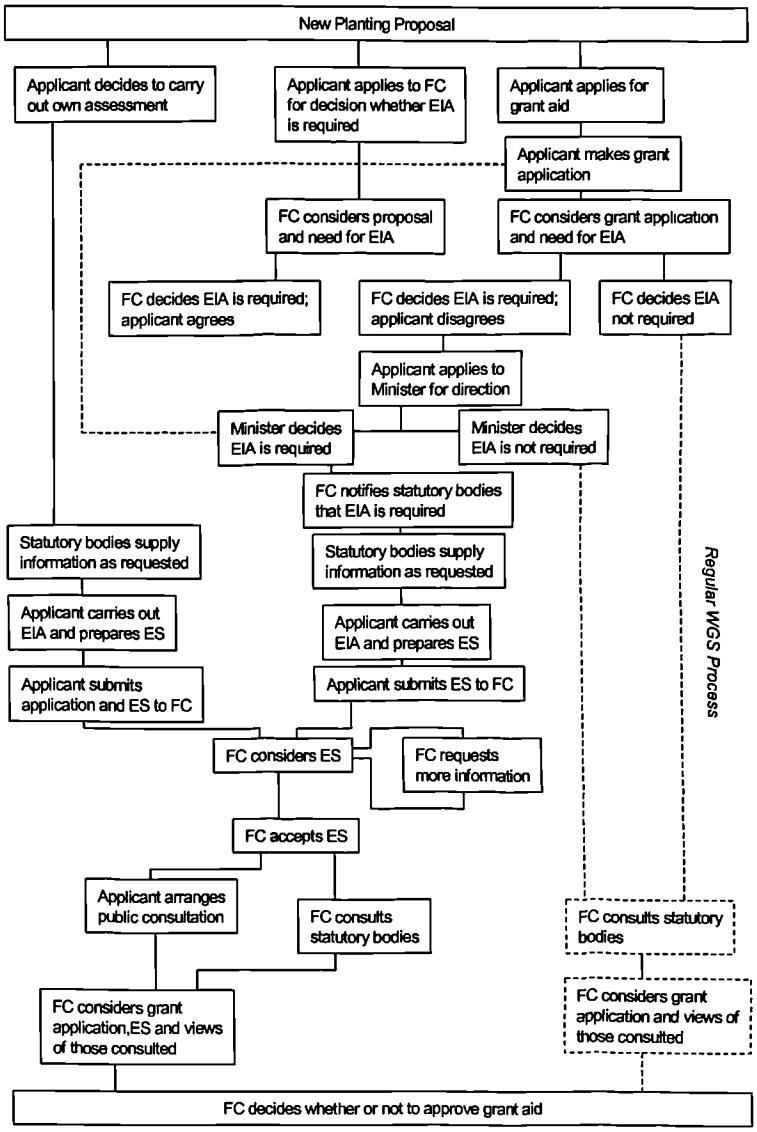


Figure 2. The environmental impact assessment process within the forest sector (1988 legislation).

Environmental assessment was restricted to afforestation projects on bare land by new planting (or in exceptional circumstances by natural regeneration). Assessment was not required for restocking whether by natural regeneration or planting. The Forestry Authority booklet, Environmental Assessment of New Woodlands (Forestry Authority, 1993) stated that assessment was to be restricted to those projects thought to have significant effects which may result in significant adverse ecological change due to their size, nature and location. It followed on to note that there was be no definitive list of circumstances in which environmental impact assessment would be necessary. The decision to require environmental impact assessment was to be taken after consideration of the features of each case. The guidance then states that environmental impact assessment will always be required for new planting proposals in an NNR or SSSI where planting is listed as a potentially damaging operation, or for projects in

excess of 100 ha in a NSA, ESA, AONB or National Park. In other situations the booklet suggested that careful consideration should be given to proposals less than 100 ha in the above designated areas or in locally designated areas such as AGLV. Similarly, the requirement for assessment had to be considered in all other cases greater than 100 ha though it would be exceptional for an assessment to be requested for proposals when the area held no special designation. An environmental statement was described as a document provided, for the purpose of assessing the likely impact of the proposed afforestation project upon the environment. A list of specified information which should be included in an environmental statement was included in the Statutory Instrument (Appendix 1.1). In addition the regulations included a list of topics which may also be included at the applicant's discretion.

2.6.3 Revisions Due to Directive 97/11/EC

The Forestry Commission was associated with the two consultation papers issued by the Government on the proposals for the implementation of Directive 97/11/EC. The Forestry Commission issued a further consultation paper in August 1998 on the proposed Environmental Impact Assessment (Forestry) Regulations 1999, amending the original 1988 regulations. The proposed main changes were:

- Deforestation added to those forestry projects that have to be considered for assessment;
- A scoping provision was to be included;
- Exclusive and indicative criteria to be introduced to aid screening;
  - Exclusive criteria were defined as areas below (Table 1) which assessment would generally not be required;

Table 1. Exclusive criteria for screening of forestry projects (from Forestry Commission consultation paper 1998).

Project Type	Sensitive Area	Non-sensitive Area
Afforestation	No criteria except for NP, AONB and NSA where threshold is 2 ha	5 ha
Deforestation	No criteria except for NP, AONB and NSA where threshold is 2 ha	1 ha
Forest Roads	No criteria	Area of work > 1ha
Forest Quarries	No criteria	Area of work > 1 ha or extends an existing quarry by > 1 ha

- Indicative criteria – assessment may be called for any afforestation proposal > 100 ha or any deforestation proposal > 50 ha. In sensitive areas smaller scale proposals may also require assessment;
- Sensitive areas were defined as:
  - Sites of Special Scientific Interest;
  - Sites classified or proposed as Special Protection Areas under EC Directive on the

Conservation of Wild Birds 79/409/EC;

- Sites designated as or identified as candidate Special Areas of Conservation under the EC Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora 92/43/EC;
- National Parks;
- The Norfolk Broads;
- The New Forest Heritage Area;
- World Heritage Sites;
- Scheduled Ancient Monuments;
- Areas of Outstanding Natural Beauty;
- National Scenic Areas.

2.6.4 The 1998 Regulations

The 1988 regulations were revoked and the new Environmental Assessment (Forestry) Regulations 1998 came into force on 1 September 1998. Confirmation of the area thresholds was expected to be given in early 1999. Unfortunately the initial changeover was marked by uncertainty as Forestry Commission personnel were given little in the way of internal guidance on how the Statutory Instrument should be interpreted (Forestry Commission, *personal communication*). The 1998 Statutory Instrument provided less information on the content and standard of assessment than the 1988 regulations, the bulk of the Statutory Instrument given over to detailing timescales for the Forestry Commission providing opinion on the necessity of assessment and the appeal process. In addition potential proponents and consultees were also given little advice on what effects the new regulations would make as the publication date of the guidance note, in draft since the mid 1990s was again delayed. In an effort to improve awareness of the new regulations the Forestry Commission held a series of internal and external seminars on environmental impact assessment in late 1998 and early 1999. In addition to the features discussed in the consultation process the 1998 Statutory Instrument also brought in a number of important measures.

The most important of these was the definition of relevant projects – projects likely to have a significant effect on the environment. Under the regulations relevant forestry projects include creating new woodlands by planting, direct seeding or natural regeneration, or planting Christmas trees or short rotation coppice. Also included was the construction of forestry tracks both within a forest and those leading to one, and quarrying to obtain material for forestry tracks. Restocking of trees on recently felled woodland was not included in the regulations. The regulations did however apply to work carried out in relation to a forestry project such as fencing, draining and ploughing. The regulations required that no work be carried out in

relation to a relevant project unless the Commissioners had given prior consent. Work carried out had to be in accordance with any conditions that may be attached to the consent. This therefore closed the loophole by which a landowner could plant trees without approval from the Forestry Commission by forgoing the Woodland Grant Scheme and waiving potential grant aid.

Under the 1998 legislation where the Commissioners, through the Forestry Commission, believed that a person was carrying out or had carried out work in relation to a relevant project without consent or in breach of the conditions attendant to consent, the Forestry Commission could serve an enforcement order on that person. An enforcement order could require that the person discontinued the work, applied for consent, restored the land to its original condition, or carry out any works or measures which the Forestry Commission considered necessary to remove or lessen the damage caused to the environment. Non-compliance with enforcement notices rendered a person guilty of an offence and liable to a fine. The Forestry Commission was also given the power to enter any land on which it is suspected that work relating to a relevant project was being or had been carried out without consent or in breach of conditions. In cases where works of compliance detailed in an enforcement notice had not been carried out in the given period, the Forestry Commission was provided with the power to enter the land and carry out the works and recover any expenditure from the person on whom the enforcement notice was served. The 1998 regulations also outlined the process through which project screening could be initiated (Figure 3).

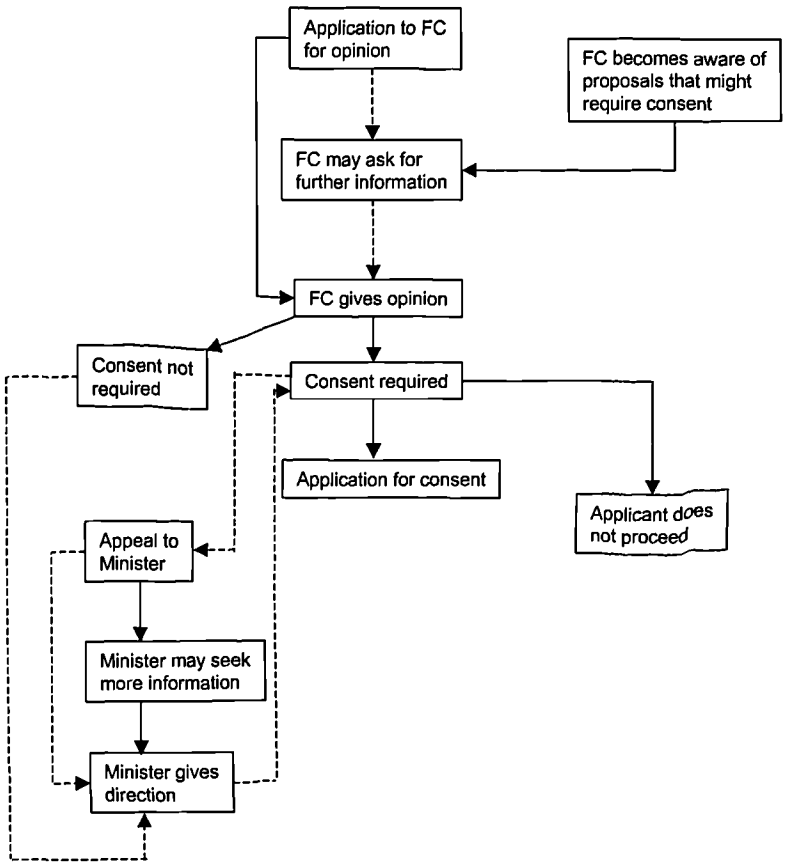


Figure 3. The process for obtaining an opinion on relevant projects from 1998 legislation

A proponent could apply in writing to the Forestry Commission for an opinion on whether or not a project was a relevant project. An application would take the form of a map of the proposed project and project area (at a scale of 1:10000 or 1:2500), a brief description of the proposal and its possible effects on the environment and, any other information that may be relevant. The Forestry Commission was required to give an opinion within 28 days of receipt of an application. In cases where the Forestry Commission considered the information provided to be insufficient they could request additional information to be provided on a mutually agreed timescale (Figure 4). Where the opinion of the Forestry Commission was that a project was a relevant project, it had to inform the proponent in writing and include a written statement of its reasons for being of that opinion. Where the opinion of the Forestry Commission was that consent was not required the person could proceed with the proposals, and if desired the person could apply for grant aid in the usual manner before work commenced. There was an appeal process to the Minister who had 28 days to collect the relevant information and a further 28 days (or longer if required) in which to make a decision.

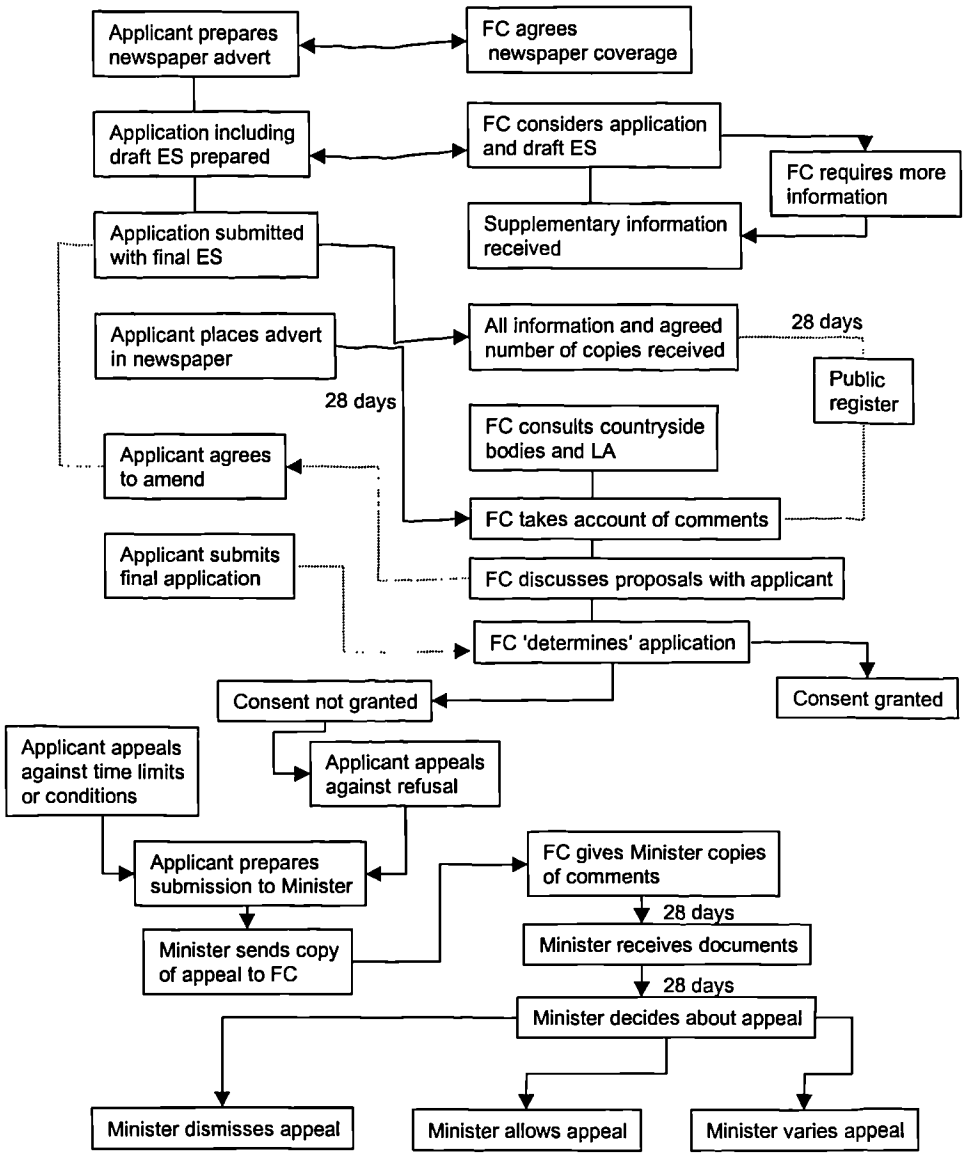


Figure 4. The environmental impact assessment process in the forest sector from 1998 legislation.

The Minister was required to provide the Forestry Commission and the proponent with a written statement of his direction, including where he directed that the project was a relevant project (and therefore required consent), the reasons for his decision. Once a project's status was determined as a relevant project a proponent could apply for consent from the Forestry Commission to allow this work to be carried out. Such an application had to be accompanied by a map of the area indicating the extent of the planting, regeneration, construction works, a description of the nature of the project (this could take the form of a Woodland Grant Scheme application), an environmental statement for the project, any other information that might be relevant and, a copy of the publicity notice that would appear in the newspapers. The Forestry Commission could ask for more information to allow full consideration of the likely environmental effects of the project. On receipt of an application or requested additional information the Forestry Commission had to provide copies of the application within 28 days to

the local authority in whose area the application lies, English Nature and Countryside Commission in England, Scottish Natural Heritage in Scotland and Countryside Commission for Wales in Wales. These bodies had 28 days in which to submit comments on the application. To allow public participation in the decision-making process applicants were required to place a notice in at least two local newspapers to allow the public and concerned individuals or bodies the opportunity to express an opinion before consent was determined. The notice was required to state that an application had been made to the Forestry Commission and specify the location of the Forestry Commission office where this could be inspected for a period of 28 days. The notice also had to give contact details from where a copy of the application could be obtained and detail any charge which may be levied.

Finally the notice was required to state that representations must be made to the Forestry Commission within 28 days at the appropriate address. At this point the application would also be included in the public register of planting and felling applications for a period of 28 days. Taking into consideration information made available by the applicant and consultees' comments (this could also involve the Regional Advisory Committee) the Forestry Commission could then refuse consent or grant consent subject to standard conditions and any other conditions considered necessary to protect the environment. Every consent had to contain two standard conditions stating that work must be started by a specified date (no more than 5 years after the date of consent), and that no work should be carried out on the project after a specified date (no more than 10 years after the date of consent).

Once an application for consent had been determined the Forestry Commission had to give notice in writing of their decision to the applicant and any person who had commented on the application, stating the reasons and considerations on which the decision was based. In addition the Forestry Commission was obliged to place a notice of their decision in the same local newspapers in which the original notice of application was placed. Where consent was refused or consent was granted subject to additional conditions, or where the time period for one or both of the standard conditions was less than the maximum period, an applicant could appeal to the Minister within 28 days of receiving the decision about the application. The Minister then had 28 days in which to obtain information or representations provided to the Forestry Commission in relation to the application. The Minister had a further 28 days (or longer if necessary) to make a determination and either dismiss or allow the appeal or vary any part of the Forestry Commission's decision. Notice of the Minister's determination giving the reasons and considerations on which the decision was based had to be made in writing to the appellant, the Forestry Commission and any persons from whom the Forestry Commission received representations on the original application. In addition the Minister's decision had to be

published in the same local newspapers in which the original notice of application was placed.

The 1998 legislation noted that any member of the public had the right to appeal to the High Court in England and Wales or the Court of Session in Scotland about the granting of consent for proposals if they felt they were in some way prejudiced by them. An application to the court had to be made within 6 weeks of the newspaper notices declaring the Forestry Commission's consent or Ministerial decision. The court could make an order quashing the consent whether this was given by the Forestry Commission or after appeal to the Minister. This order would be on the basis that full account was not taken of all the environmental information and representations submitted about the application to the Forestry Commission or any appeal to the Minister. The court could also quash the consent if the interests of the applicant were prejudiced by a failure of the Commissioners to comply with the regulations. The court could make an interim order staying the operation of the consent on any terms it may see fit until a decision about the application has been made.

2.6.5 The 1999 Regulations

Following a subsequent consultation process, on 6 September 1999, the Environmental Impact Assessment (Forestry) (England and Wales) Regulations 1999 (HMG, 1999b), and the Environmental Impact Assessment (Forestry) (Scotland) Regulations 1999 (The Scottish Executive, 1999b) came into force to further implement the changes made to the original 1985 Directive by Council Directive 97/11/EC. The 1999 Regulations (appendix 1.3) restate the requirements of the 1998 Regulations and detail revisions and amendments.

A major change from the 1998 Regulations is that the 1999 Regulations refer individually to England and Wales, and Scotland following the establishment of the Welsh Assembly and the Scottish Parliament, otherwise the regulations are identical. The 1999 Regulations are analogous to the previous 1998 Regulations in prescribing work or operations which have been deemed to be relevant projects unless consent has been obtained from the Forestry Commission or through appeal to the Minister of Agriculture, Fisheries and Food in England, the National Assembly for Wales or the Scottish Ministers. The 1999 Regulations also give a more detailed description of what is to be considered as a relevant project. Relevant projects are works or intervention in the natural surroundings or landscape including the extraction of minerals. The types of project which are considered as relevant are as given in the 1998 legislation:

- Afforestation projects;
- Deforestation – conversion to another type of land use;
- Forest quarry works – operations on land used for or to be used for forestry to obtain material for use in forest road works;

- Forest road works – the formation, alteration or maintenance of private ways on land used or to be used for forestry purposes.

The 1999 Regulations follow on in Schedule 2, to give thresholds for the identification of projects likely to have significant effects on the environment. These vary slightly from those proposed in the consultation document.

Table 2. Exclusive criteria for screening of forestry projects from 1999 legislation.

Project type	**Threshold where any part of the land is classified as sensitive**	**Threshold where no part of the land is classified as sensitive**
Afforestation	2 ha where the sensitive area is a NP or AONB No threshold for other sensitive areas	5 ha
Deforestation	0.5 ha where the sensitive area is a NP or AONB No threshold for other sensitive areas	1 ha
Forest road works	No threshold	1 ha
Forest quarry works	No threshold	1 ha

In the case of extensions to existing proposals the above thresholds do not apply. An extending project is one covering land adjoining to a material past project. A material past project is of the same project type, which was completed after the 1999 Regulations came into force and was completed no more than five years prior to the proposed starting date for the extending project. For projects fulfilling these requirements the thresholds will instead be the balance of the above thresholds, after the deduction of the accumulated material past project area, which is considered to be the total area covered by all material past projects, and any other project whose area adjoins the material past project and is of the same type and completed after the 1999 regulations came into force, and no more than five years before the proposed starting date for the extending project. Within Schedule 3 the Regulations detail selection criteria for projects having significant effects on the environment:

- Project characteristics – size, cumulation with other projects, the use of natural resources, the production of waste, pollution and nuisances, the risk of accidents;
- Project location – existing land use, the relative abundance, quality and regenerative capacity of natural resources in the area, the absorption capacity of the natural environment, in particular:
  - Wetlands;
  - Coastal zones;
  - Mountain and forest areas;
  - Nature reserves and parks;
  - Areas classified through Directives 79/409/EEC or 92/43/EEC;
  - Areas in which EC environmental quality standards have already been exceeded;

- Densely populated areas;
- Landscapes of historic, cultural or archaeological importance;

- Characteristics of the potential impact – extent, transfrontier nature, magnitude and complexity, probability, duration, frequency and reversibility.

The provisions of the 1998 Regulations for an opinion whether a project is a relevant project, directions by the appropriate authority, assistance and publicity are reiterated in the 1999 Regulations. The 1999 Regulations provide for projects which are deemed by the Forestry Commission likely to have significant effects on the environment of another European Economic Area (EEA) State or where another EEA State considers its environment likely to be effected by a project. In either case the Forestry Commission must provide the appropriate authority (Welsh Assembly, Scottish Ministers or Minister for Agriculture, Fisheries and Food in Wales, Scotland and England respectively) with a copy of the environmental statement. The appropriate authority is then obliged to publish a description of the project and details of possible significant effects on the environment in the other EEA State within the London Gazette, or Edinburgh Gazette in Scotland, together with an indication of where further information is available. The other EEA State must be supplied with this information no later than this publication giving a reasonable time for response. The appropriate authority is also obliged to inform the proponent that the project has been considered as having a potential significant effect on the environment of another EEA State. Where another EEA State requests participation in the procedure the appropriate authority is required to provide it with a copy of the application for consent, a copy of the environmental statement and any other relevant information. In such cases the appropriate authority must allow reasonable time before the determination of the application for consent for the other EEA State to make a response. Where necessary the appropriate authority is required to consult with the EEA State regarding potential significant impacts and potential mitigation methods. Once a determination has been made the appropriate authority must forward details of the decision and any conditions attached to it, the main reasons for the decision and a description where necessary of the methods of mitigation included in the project.

The 1999 Regulations provide for the establishment of a series of registers in each Conservancy of the following information:

- Each direction by the Forestry Commission that a project is exempted from the application of these Regulations;
- Each opinion of the Forestry Commission whether or not a project is a relevant project;
- Each direction by the appropriate authority where a proponent has applied to the appropriate authority following notice by the Forestry Commission that the project is a

relevant project or the Forestry Commission has failed to give an opinion within 28 days;

- Each opinion by the Forestry Commission as to the information which should be contained within the environmental statement for that project;
- Each direction made by the appropriate authority as to the information which should be contained within the environmental statement for that project, in cases where the Forestry Commission has failed to give its opinion within five weeks;
- Each determination by the Forestry Commission to grant consent for a proposal including any conditions attached, or, to refuse consent;
- Each determination by the appropriate authority following an appeal against the decision of the Forestry Commission to refuse the application, or grant consent.

In addition the register must also keep statements of reasons accompanying any of the above judgements and each environmental statement received. The Regulations require that registers are available for public inspection at all reasonable hours.

2.7 The Environmental Impact Assessment Process

2.7.1 Introduction to the Process

If initiated early enough in the planning and decision making process, environmental impact assessment can be thought of as a procedure through which a series of alternative courses of action can be examined in a systematic, unbiased manner. This allows a decision to be made, being fully cognizant with the possible effects of each course of action as to whether one alternative is selected, all are rejected or one is selected subject to the inclusion of certain mitigating factors. The Department of the Environment (1989) describes environmental impact assessment as a technique and a process through which information about the environmental effects of a project can be collected, both by the developer and from other sources, and taken into account by the planning authority when forming their judgement on whether the proposed project should go ahead. While nationally there is no set format for an environmental impact assessment, competent assessments share certain links in the process of assessment. A generic framework for the assessment process is given in Figure 5. Current legislation in the UK does not require the mandatory inclusion of some of these steps. It should also be borne in mind that these steps need not be carried out in the set order and that environmental impact assessment should be an iterative process re-assessing points whenever new information comes to light (Glasson *et al.*, 1999). There have been many commentators on the development of the assessment process and its current format Wathern (1988), Lichfield (1992b), OECD (1992), Canter (1994), Goodland and Edmundson (1994), Bissett (1995), Sadler (1996), Harvey (1998), Harrop and Nixon (1999). The integration of environmental impact assessment into the project planning cycle is shown in Figure 6.

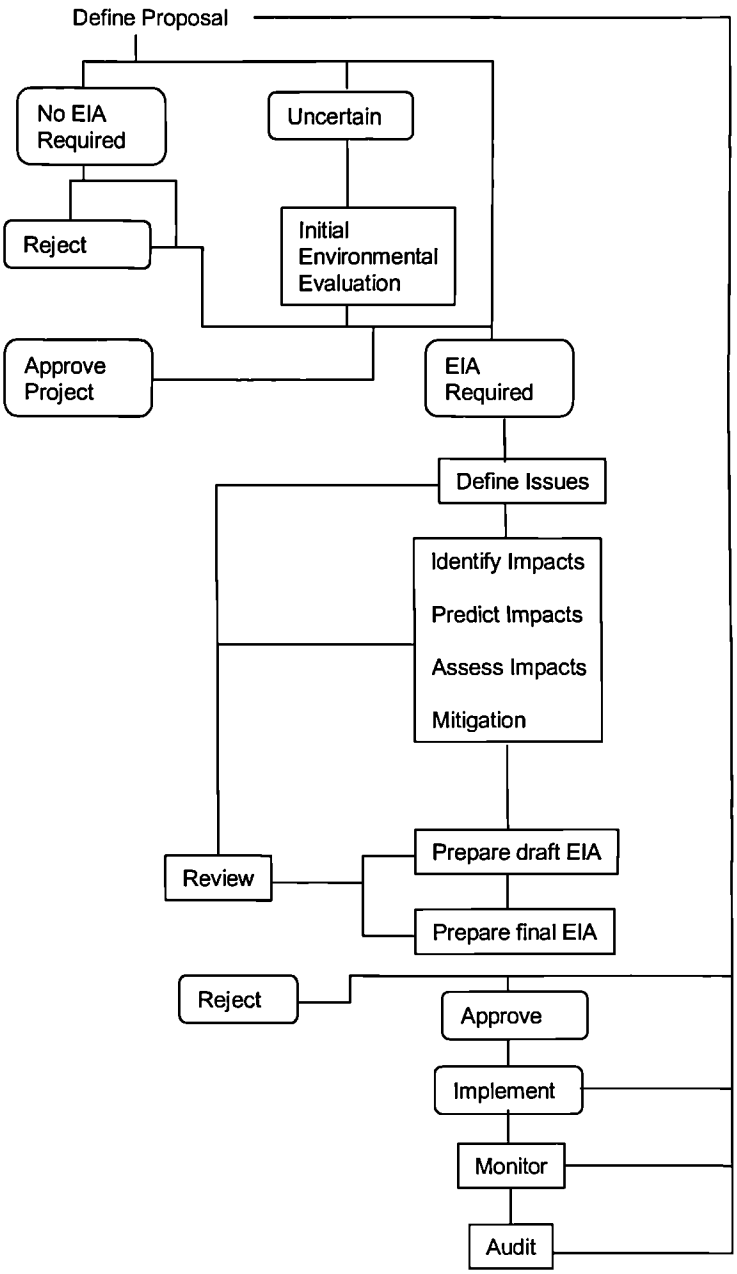


Figure 5. Stages in the environmental impact assessment process (after Wathern, 1988).

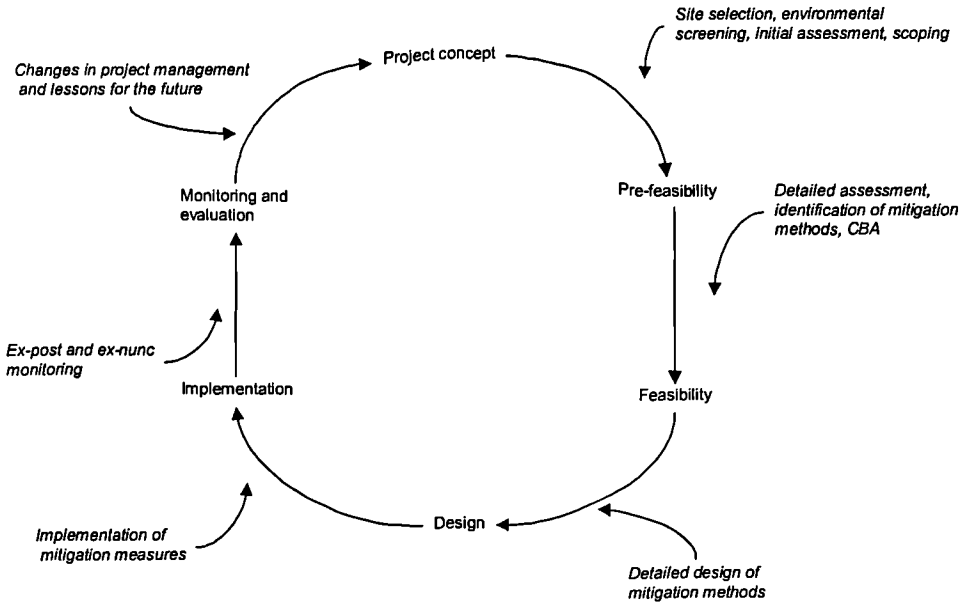


Figure 6. The integration of environmental impact assessment and the project planning cycle (after UNEP 1988).

An individual environmental impact assessment can be thought of as consisting of three parts, start-up consisting of screening and scoping, the environmental impact assessment study and follow-up.

2.7.2 Screening and Scoping

The purpose of screening is to decide whether or not a project requires assessment and in some systems of environmental impact assessment the level of assessment that is necessary (Wood, 2000). While it is generally accepted that all projects will involve impacts, the process of screening separates those projects that are not likely to have serious adverse environmental consequences from those which are considered to be likely to have potentially significant adverse impacts. While screening is normally carried out using information already available, in cases where information is not existing, or the potential effects of the project are not well understood it may be necessary to carry out some form of initial environmental evaluation. Screening therefore is the process through which the application of assessment is concentrated onto those projects likely to have significant environmental impacts. Hence within the European framework projects listed in Annex I are thought by their nature to always have significant effects while Annex II projects may or may not have significant impacts depending on the particular project. The methods used in screening include screening criteria such as size, cost, location; lists of project types such as given above, and checklists of project and environment types which often require further investigation. Ortega-Rubio, Salinas-Zavala, Lluch-Cota and Troyo-Dieguez (2001) present a methodology for screening projects which supports objective decision making based on a series of qualitative criteria. While developed for harbour and port projects Ortega-Rubio *et al.* (2001) suggest the methodology is transferable

between sectors. Weston (2000) stresses the importance of the use of a systematic process for screening to ensure consistent application. Mwalyosi and Hughes (1998) highlight the effect of different screening methodologies on screening outcomes and stress the need to have a simple and effective methodology in order to instill confidence in the system.

Once a project has been identified through screening as requiring assessment, scoping is that part of the process which identifies those aspects of the project which are likely to give rise to significant issues and concentrates attention on these. Any project is likely to have a large number of potential impacts the majority of which may be unnoticed or inconsequential for decision making. Scoping narrows down from the large number of impacts of potential impacts to those key issues for the decision making process. The process of scoping is seen to be especially critical in controversial cases (Lane, Hoffeld and Griffin, 1998, Mulvihill and Jacobs, 1998). It also provides the opportunity for interested third parties including stakeholder organisations and local people to input into the decision as to what the focus of attention should be within the assessment. The risks of failing to address adequately issues or identify issues are reduced through making best use of the knowledge of local people. Also, since local people may be those most affected by the proposal it would be unreasonable to carry out an assessment without due regard for the concerns of and issues raised by local people. Eccleston (2000) notes the lack of a universally accepted methodology for determining the scope of an assessment. In a study by Sadler and Verheem (1997) of 25 environmental impact assessment systems half had specific scoping requirements and all but two included some form of scoping and made provision for consultation including public consultation. Generally, scoping is carried out by the assessment team, however the vagaries of this approach can lead to poor assessment performance as the team may lack sufficient knowledge of the project or the site, or may be influenced by bias. Best practice therefore extends the scoping process out to include a wide range of interests (Mulvihill and Jacobs, 1998 and Del Furia and Wallace-Jones, 2000). This process has been taken to its limit in the Netherlands where scoping is carried out by an independent commission. The importance of scooping is highlighted in the results of Wood, Dipper and Jones' (2000) study of 28 projects 70% of which included a scooping process. In cases where scoping was carried out a higher proportion of impacts were correctly identified.

The process of scoping is essentially the gathering of information on the project, the site and the surrounding environment with the aim of ensuring that all issues and concerns are considered. Scoping will normally include a combination of liaison, discussion, consultation and exchange of information with any interested parties, which could include the proponent, the competent authority, local groups and individuals, special interest groups, decision makers, regulatory or statutory bodies, local authorities and experts in relevant specialist disciplines. In particular,

useful public participation is seen as vital and should be initiated as early as possible within the process. Vasconcelos, Hamilton and Barrett (2000) and Steinemann (2001) suggest that public participation often occurs too late in the process and the methods of consultation used are generally inadequate. The scoping process should result in the identification of pertinent issues which should be addressed. While there is no one correct manner through which this can be achieved the use of checklists, matrices and participatory techniques are often helpful (Parrot and Moyes, 1997). Roche (1999) discusses the use of participatory techniques during scoping exercises by development agencies. Usher (2000) notes the importance of including traditional ecological knowledge in environmental impact assessments for forestry in Canada. The proposed amendment to Directive 85/337/EEC (CEC, 2001a) recognizes the benefits of effective public participation in environmental decision making. The proposed amendments to the Directive include a definition of the public concerned, or those likely to be affected by or interested in the proposal. The amendments also include details of the type of information which should be made available to the public and that the public should be provided with the opportunity to express their opinions and comments to the competent authority before a decision on consent is made. It may also be useful to begin to identify any components of the project or environmental attributes which are considered not to give cause for concern, thus allowing the scope of attention to be narrowed. This can be identified by making a statement such as a 'Finding of No Significant Issue' (FONSI) for individual elements (Weston, 2000). Eccleston (2000) describes the use of a new tool, the decision-information tree, which places emphasis on first identifying the decisions that may need to be made in order to scope the assessment. While a *modus operandi* which included progression through consensus would be ideal, this is rarely achievable in cases where there may be considerable distance between the aspirations of participants. It is therefore usual for the competent authority to assume the role of arbiter or referee to ensure that all competent issues are considered without placing undue burden on the assessment.

In addition to identifying which elements are to be included in the assessment the scoping forum also provides the opportunity for the rules by which the assessment is to be carried out can be discussed and agreed. Regardless of how well an assessment has been scoped, a poor assessment will result if the techniques used in baseline data collection, impact prediction and determination of significance are inadequate for the task. Adequate scoping is especially important where the assessment will be working within areas of uncertainty through lack of baseline data, poor understanding of natural processes, or limited experience of using new techniques. The scoping process can pro-actively avoid problems associated with for example unacceptable sampling techniques, invalid use of models or inappropriate setting of significance thresholds of concern. If left solely to the discretion of the assessment team these could result

in delays in the completion of the assessment and project. In the UK there is no mandatory scoping phase. Leu, Williams and Bark (1995) noted that only 30% of local authorities in England and 24% Scotland included provision for scoping meetings.

2.7.3 The Environmental Impact Assessment Study

While screening and scoping form part of the overall assessment process, the mechanics of addressing impacts through the consideration and evaluation of effects caused by the project, is carried out within the environmental impact assessment study. The issues to be included in the assessment which have been defined through scoping can be thought of as a series of questions for which the assessment must provide reliable answers. These questions include:

- What impacts will occur?
- What will be the magnitude, extent and significance of any impacts?
- What can be done to avoid or mitigate any impacts?

The first step in the assessment study is therefore the identification of impacts. As noted above, best practice within screening and scoping will ensure that the assessment is not initiated from a standing start. Scoping in particular should have begun the process of eliminating those impacts which are not seen as potentially significant. However the assessment process should not be seen as a series of separate stages rather an iterative process which is continually refined as additional information is brought together. While screening and scoping are generally carried out using information readily available, the identification of impacts within the assessment study normally includes the collection of information on the proposed site. This is so-called baseline data and forms the foundations of the assessment, together with in-depth analysis of the project itself. This may require the commissioning of primary data collection through survey work on a range of topics. Oakley, Pratt and Clayton (1998) stress the importance of collecting only particularly relevant data and only as much as is required for the specific assessment. The project description should include the rationale or impetus for the project and describe the major characteristics, work programmes and methods.

A description of the environment establishes the baseline data of the status of environmental features under consideration at the present and in the future (without the project) taking full regard of existing trends. Full understanding of the without project scenario is essential as the assessment process considers the difference between the with and without project environmental status and decides whether the difference between the two should be regarded as significant or not significant. As a better understanding of the environment and the project is achieved through the collection of baseline information the assessment should have an improved understanding of potential effects of the project. Therefore the views resulting from the screening and scoping stages can be further refined with new impacts being identified or

original ones removed from further appraisal. A variety of methods can be used during this process such as checklists, matrices, questionnaires, overlays, modeling and simulations (Bissett, 1979, 1980; Hollick, 1981; Shopley and Fuggle, 1984; Morris and Therivel, 1995; Pastakia and Jensen, 1998; Coakes, Fenton and Gabriel, 1999). A useful but often forgotten method of identifying impacts is through the analysis of analogous situations, the outcomes from similar projects or similar site types or the results of previous assessments in the same sector or area.

The early stages of the assessment study often includes the consideration of alternatives including different processes, sites, scales and the zero-option of not proceeding with the proposal. Steinemann (2001) notes that it should not be assumed that selection of the zero-option does not mean that no impacts would occur and potential impacts from adopting the zero-option should also be included in the evaluation of alternatives. While the consideration of alternatives is useful if not essential within the early stages of project planning, if carried out too late in the process once a proposal is well developed the resulting consideration may be superficial (Steinemann, 2001). The assessment process can therefore act as a check to ensure that all viable alternatives have been considered and the proposal in question is the optimum in terms of its environmental, social and economic consequences.

Once the range of potential impacts has been identified predictions of the extent and magnitude of these impacts must be made. These can be positive and negative, long and short term. This is perhaps the most difficult part of the assessment study. George (2000) lists five major impact prediction techniques:

- Past experience
- Numerical calculations or models
- Experiments or tests
- Physical/visual simulations and maps
- Professional judgement

George (2000) notes that all have inherent strengths and weaknesses but these can be overcome by using a combination of techniques rather than a single method. Within this stage attempts are made to understand the cause and effects of potential impacts despite the fact that in many cases these are not well understood. Even when the processes involved are well known the availability and quality of data with which to work can be limited and unreliable. In other cases the potential impacts under consideration do not lend themselves to easy appraisal through quantified means, therefore qualitative prediction methods would have to be used. The value of environmental impact assessment is not diminished as long as the mechanism used is made

explicit (Beattie, 1995). Hence it is essential that the means of impact prediction is fully open and the assessment should acknowledge uncertainties inherent in the data being used or the techniques being applied during the process.

When impacts have been identified and predictions made on their extent and magnitude the next step within the process is to make a determination of their significance. The whole premise of environmental impact assessment is based around the significance of impacts. Impacts which are considered to be non-significant are taken to be impacts which would be freely accepted as a result of project implementation. Impacts which are considered to be significant are taken to be unacceptable and must be removed or reduced to a level which would be considered as not significant before the project can go ahead. However the determination of significance is often subjective and value laden and therefore subject to debate. It is therefore imperative that this is carried out in an open manner. For example, at a local level a project may be considered to have a significant impact on local residents. However at a national level the same project may be considered as not significant in terms of its impact on the national population. It is therefore crucial when considering significance it must be set in context at local, national and international levels.

There have been various methods and approaches to assist in the determination of significance however at its simplest qualitative form significance should be a comparison of predicted change of an environmental parameter with a set threshold of concern. The threshold of concern is that point or level of change at which an impact changes from being non-significant to significant. The open statement of the threshold of concern and the reason through which it has been selected is a vital part of the process. In some cases the determination of significance can be relatively simple. For example with easily quantified parameters such as water quality, national or international water pollution standards would allow easy determination of significance. Where such standards do not exist or where issues are not readily quantifiable other considerations could include government or company policy objectives, the views of local or affected people or the status or fragility of habitats, ecosystems and species. In all cases where some degree of uncertainty exists provision should be made within the assessment to determine adequate monitoring and auditing programmes which will track actual project performance (this topic is discussed in Section 2.7.4).

If the process identifies significant impacts the proposal of methods of mitigation introduces possible measures which may reduce or remove adverse impacts, or enhance beneficial impacts. Mitigation measures to avoid or reduce impacts can include the selection of new or altered project designs, alternative sites or revised methods of working. A final option, which does not fit well with the ethos of sustainable development is to repair, rehabilitate or restore the affected

environmental components. There may be occasions where it is impossible to reduce impacts to levels of non significance and in these cases mitigation measures may be limited to the offer of compensation to those affected by the proposal either monetary or through provision of services or facilities. With this process it is vital to quantify the efficacy of the methods of mitigation and the level of any residual impact.

The process of identifying, predicting and evaluating impacts will normally be carried out by the assessment team. However the reasons for carrying out an environmental impact assessment include the provision of pertinent information for the decision makers and potentially affected stakeholders. The communication of the findings of the environmental impact assessment has traditionally been achieved through the preparation of an environmental impact statement. The environmental impact statement can be seen as the record of the environmental impact assessment process and therefore must give a full account of the methods and techniques used within the assessment as well as the eventual findings of the assessment. An essential part of the environmental impact statement is the summary as in most cases this will be the only part of the statement read by the majority of people. It is essential that the summary gives a full précis of the whole environmental impact statement but places due emphasis on key issues. Vasconcelos *et al.* (2000) noted that non-technical summaries were frequently overly technical making them difficult to understand and social impacts were inadequately dealt with. Further Vasconcelos *et al.* (2000) identified a lack of credibility attached to the information contained within non-technical summaries. A detailed discussion of the role of the environmental statement is given in Section 2.8.

2.7.4 Follow-up

Once the environmental impact statement has been prepared the following elements can be regarded as the third stage of the environmental impact assessment process. Although not mandatory practice in all environmental impact assessment systems the benefits of independent review of environmental impact assessments is generally accepted as making an important contribution to the success of the environmental impact assessment process as a whole and the value of individual project environmental impact assessments. The external or third party review process provides the check on the fullness and competency of the assessment and helps to exclude bias from the assessment process (Arts, 1998, Glasson *et al.*, 1999, Lee, 2000). The review process can result in the assessment being expanded or re-visited should failings in the scope of the issues addressed or the completeness of the appraisal be identified. An environmental impact statement can therefore pass through draft stages prior to publication of a final document. The results of the environmental impact assessment can, through the environmental impact statement be introduced to the decision making process for consideration

by the competent authority as to whether or not the project gains consent and should be allowed to proceed. There are no set rules on how review should be carried out. However it is generally accepted that a systematic procedure allows even application. It also allows all actors to know what is considered necessary by the review process.

Very few projects are of a nature that potential impacts are limited only to the construction or pre-operational stages of the projects' life cycle. In most cases projects will continue to present potential impacts although these may well be different from those identified for the initial stages. It is important therefore that the process of environmental impact assessment should not stop at the point of decision making if environmental impact assessment is to achieve its objectives. For environmental impact assessment to be fully developed rather than being auxiliary to the process of obtaining project approval, environmental impact assessment should provide the means to sound environmental management throughout the project life. In order to achieve this monitoring and auditing must be incorporated into the process and should be part of the assessment and detailed in the environmental impact statement. Two methods of designing and analysing monitoring studies, intervention analysis (IA) and impact vs. reference sites (IVRS), are discussed by Stewart-Oaten and Bence (2001). Wallace and Shalkowski (1998), detail tracking tools that have been applied to monitor changes in predicted impacts and mitigation commitments detailed in environmental statements. The importance of monitoring and post-development auditing should not be overlooked as a means through which to learn from experience (Wood, 2000b). On a project level monitoring and auditing can improve project management. By acting as a control, monitoring and auditing can identify whether or not the effects of the project are behaving in the manner predicted by the assessment. Hence predictions on how environmental attributes would respond to the project can be compared with actual occurrences, predictions about the efficacy of mitigation measures can be examined and new, or unexpected impacts can be identified at an early stage and hopefully remedied. At a process level, monitoring and auditing can help prevent the 're-invention of the wheel', through experiential learning of project characteristics and environmental elements' frailties, screening can be improved. Similarly advantage can be taken of experience gained on data collection methods, impact identification and prediction techniques and the suitability of different forms of mitigation measures. Wood (1999a) describes four types of post development audit:

- Implementation audit – checking whether planning conditions and or mitigation measures have been met;
- Project impact audit – identification of actual impacts, generating feedback and potentially helping management of the project;
- Predictive techniques audit – takes the project impact audit one step further by making a comparison between predicted and actual impacts;

- Environmental impact assessment procedures audit – draws on all three of the above to provide a performance review of environmental impact assessment at a macro level in terms of effectiveness and efficiency looking at policy and technical issues.

Wood (1999a) also notes the scarcity of systematic examinations of predictive techniques audits.

2.8 The Environmental Statement

Wathern (1988) describes environmental impact assessment as a process with the objective of providing decision-makers with an indication of the consequences of their actions, and that this process can take place at any level of planning. This could be expanded to include stakeholders. An environmental statement can be thought of as the hard copy of this information gathering and analysis process. This allows the quick and easy transfer of the knowledge gained by those who carried out the assessment to those charged with the responsibility of making a decision on the future course of action. Wood, Lee and Jones (1991) describe the environmental statement as the written record of the environmental assessment process which subsequently provides the basis for consultation, participation and decision-making. Lee and Brown (1992) later state that in the future the focus of attention will move from being on the extent of compliance with regulations to the degree of success afforded from the implementation of environmental impact assessment measured through the quality of the environmental impact statement. The earlier frameworks of Jones, Lee and Wood (1991), Glasson *et al.* (1994) and Wathern (1988) have been combined to give an example of the contents of an environmental statement for a project. This is seen to provide a more complete environmental statement than detailed in regulatory requirements -

1. Non-Technical Summary;
2. Methods and Key Issues:
   - Scoping;
   - Methods statement;
   - Summary of key issues;
   - FONSI statements for elements scoped out;
3. Background to the Proposed development:
   - Preliminary studies: need, planning, alternatives, site selection;
   - Site description/baseline studies;
   - Description of proposed development;
   - Construction activities and programme;
4. Baseline Conditions:
   - All key environmental elements from scoping in 2;

5. Environmental Impacts:

   All key impacts from scoping in 2;

   Assessment results;

   Impact significance;

6. Mitigation Measures;

7. Monitoring Programme Statement:

With the wide variety of legislation under which assessments are carried out, one can expect a large variation in the quality of environmental statements. While international differences may be expected, Glasson *et al.* (1999) note that there are marked differences in environmental statement quality between sectors effectively using the same legislation. A study by Jones, Lee & Wood (1991) on a sample of 100 environmental statements prepared in the UK discovered regular omission of mandatory information. Over 30% of environmental statements did not include a non-technical summary and 7% failed to include a description of the proposed development. Discretionary information was less frequently included with only 34% of environmental statements making any mention of alternative options studied. With increasing experience it would be reasonable to assume that the quality of environmental statements will improve, however, commentators such as Glasson *et al.* (1999) and Lee & Colley (1992) suggest that within the UK the quality of environmental statements is not particularly high. Hickie and Wade (1998), Barker and Wood (1999) and Noble (2000) have found similar results. Lee & Brown's (1992) survey suggests improvement between 1988-1991, however a doubling in the number of environmental statements judged satisfactory to 60% must be tempered with the 40% that remained unsatisfactory. The reasons for this low quality were attributed to a number of factors:

- Competent authority inexperience;
- Environmental statement author inexperience;
- Limitations of budget or time;
- Lack of communication between assessment team members due to fragmented and uncoordinated research.

However a main reason for the low quality of UK environmental statements is the lack of an established review procedure. Although there are a number of review methods readily available to those producing environmental statements only one third of local planning authorities use any form of review criteria, which is then normally an informal check to highlight areas for further work (Glasson *et al.*, 1999). A growing number of environmental statements are subjected to an external review by independent consultants as competent authorities recognise limitations of expertise and resources. However this is still not widespread (Leu, Williams and Bark, 1995). This could highlight a residual view among both developers and competent

authorities that the environmental impact assessment process is an additional planning hurdle which should be cleared with minimum cost and delay. A review procedure would ensure that environmental statements presented to the decision making process contain credible information of a nature which is useful to the decision-makers. This information should be concentrated on the pertinent points of the particular proposal and provide sufficient information upon which a decision can based. Without a review stage an environmental statement can be biased, incorrect or include little or no additional information for the decision-makers to take into account.

Another reason may be the lack of clear guidance and tangible requirements for the quality or content of environmental statements. In the USA, NEPA, contrary to the prevailing trend, was a short piece of legislation and left substantial scope for discretion in interpreting the act. A large proportion of the litigation surrounding the early years of NEPA was concerned with clarifying the requirements of environmental statements. Wood (1995) suggests early environmental statements were very poorly completed, with the agencies trying to avoid preparing them as far as possible. This led to the preparation of environmental statements which were designed more to provide an arsenal with which to fight in the courts rather than introduce the necessary information into the decision making process. Wood (1995) notes that the environmental statement for the Trans-Alaska Pipeline was reputedly more than 2 metres thick. Subsequent legislation has been far more detailed, with supporting procedural directives. Although Europe and the UK have avoided lengthy USA-style litigation, it could be commented that the legislators failed to take advantage of early USA experience and prepare detailed legislation with tight directives for environmental impact assessment and environmental statement composition and quality.

2.9 International Comparison

Section 2.2 noted that environmental impact assessment legislation has taken a number of different forms throughout the world. While no one system can be thought of as ideal, some appear to have distinct advantage over others and provide for more stringent assessment of proposed developments. This section identifies organisations which have developed environmental impact assessment policies and guidelines that are felt to maintain and improve the quality and efficacy of environmental impact assessment. Where instances of good practice are available these may provide insight into how existing practices in the British forest sector could be improved. There is however no one single definitive list of those governments, agencies and organisations which have adopted environmental impact assessment procedures. One of the main problems in attempting to collate such a list is the wide variety of methods used within individual countries and organisations to establish environmental impact assessment procedures. While some countries make use of mandatory regulations, statutes or

acts to enforce the process, others have established environmental impact assessment guidelines which oblige the relevant competent body to ensure the process is followed, although they are not legally enforceable. A third hybrid allows the competent body to request that an environmental impact assessment be carried out at their discretion. The identification of environmental impact assessment legislation or guidelines is further clouded as while some countries have established stand-alone legislation or guidelines others have legislation and guidelines linked to or wholly integrated within other processes such as nature conservation or planning systems. However work has been undertaken to identify those countries where legislation for or guidance on the implementation of environmental impact assessment has been developed. From work carried out by the IIED (1995) and Roe, Dalal-Clayton and Hughes (1998) it can be seen that by 1998 while sixty-six countries had produced cross- or multi-sectoral legislation and guidelines, only six countries had issued specific guidelines relating to environmental impact assessment and forestry, the United Kingdom, Italy, Spain, Chile, Sri Lanka and Zimbabwe. However for this research, while the focus of attention within the United Kingdom was the potential impacts of afforestation projects on other receiving environments, within environmental impact assessments from the forest sector of countries such as Costa Rica (MIRENEM, undated), Sri Lanka (IUCN, 1993), India (ADB, 1995) and the USA (USFS, 1997a,b,c; Grigal and Bates, 1997; Boyer 2001) the focus is on the impact on existing forests as the receiving environment through logging, roading, development projects and life cycle analyses.

There are a number of institutions and organisations which have long and wide ranging experience in the practice of environmental impact assessment. In particular organisations linked with development projects have recognised the strengths of using environmental impact assessment not only to identify and mitigate potential impacts associated with projects but also as an organisational culture or theme around which all development projects are planned. Within these organisations environmental impact assessment is not an extra post-planning check on how well a project has been designed, it is central to the manner in which planning is carried out and is a process which is initiated at the earliest stages of project planning.

2.9.1 The World Bank

The World Bank issued a policy for environmental impact assessment in 1989 (World Bank, 1989), through Operational Directive OD4.00, updated through Operational Policy OP4.01 and Bank Procedure BP4.01 (World Bank, 1999). This was prepared to ensure that development options under consideration by the World Bank were environmentally sound and sustainable and that any environmental consequences were recognised and dealt with during the planning process. In addition to preventing environmental damage the World Bank stressed the

importance of the assessment process in avoiding additional costs and delays in implementation due to unforeseen environmental problems. The directive describes the implementation of the assessment process at project, regional and sectoral levels. The directive follows on to give a series of internal procedures to be followed in cases where assessment is necessary. In common with the situation in the United Kingdom it is the responsibility of the borrower (developer) to carry out the environmental impact assessment. The role of the World Bank is to assist and monitor the process. The directive provides guidance on screening through the categorisation of projects into four levels based on the nature, magnitude and sensitivity of the environmental issues (World Bank, 1999):

- Category A: assessment is normally required due to potential diverse and significant impacts. Examples include large-scale aquaculture, dams, reservoirs, forestry, large-scale irrigation and drainage, mineral development, pipelines, resettlement, transportation.
- Category B: limited analysis is appropriate due to potential specific environmental impacts. Examples include small-scale agro-industries and aquaculture, public facilities, renewable energy, telecommunications, rural water supplies and sanitation.
- Category C: assessment is not normally required as the types of project do not normally result in significant environmental impacts. Examples include education, family planning, heath, institutional strengthening, technical assistance. Beyond screening, no further action is normally required for a Category C project.
- Category F/I: projects involving investment of Bank funds through a financial intermediary, in subprojects that may result in adverse environmental impacts.

The World Bank also recognises a fifth category Emergency Recovery Projects, which do not normally require assessment due to the need to progress rapidly and such projects usually attempt to restore existing facilities rather than create new ones.

Having screened a project as requiring assessment, identified the major environmental issues and determined the level of assessment required the World Bank assists the borrower to scope the assessment by setting the terms of reference for the assessment. Depending on the project, a range of techniques can be used to fulfil the Bank's assessment requirements, environmental impact assessment, regional or sectoral environmental assessment, environmental audit, risk assessment or the preparation of an environmental management plan. The assessment process can include one or more of these techniques or draw elements from them as appropriate. The Bank can explore with the borrower the need for specialists to assist in the assessment, in addition to preparing a preliminary timetable for the assessment to be carried out. Crucially the World Bank stresses the need for independent specialists not affiliated with the project to carry

out the assessment. While the responsibility for carrying out the assessment rests with the borrower, the borrower carries out the assessment in close collaboration with the World Bank. It is noted that this can take between 6-18 months and can generally account for 5-10% of the cost of the project. The need for adequate baseline information is stressed suggesting that both short and long-term baseline surveys may be required. While the results of the assessment are normally prepared separately, the directive suggests that it should be integrated into the overall feasibility study and project design. The directive includes a sample outline of an assessment report which includes the common elements such as an executive summary, project description and baseline data, prediction of and evaluation of impacts together with mitigation and monitoring. In addition the sample outline also provides for information on:

- Policy, legal and administrative framework – the environmental requirements of the country in which the project is situated and those of any co-financiers;
- Environmental management and training – the existence, role and capability of environmental protection at project, agency and ministry levels, and the extent to which these require training or strengthening;
- Record of inter-agency/forum meeting – records of invitees and attendees, and minutes of discussion. Where local stakeholder and NGO views were collected through other means these should be specified.

The World Bank recommends that the main text of the full assessment report should be no longer than 100 pages and that the executive summary, highlighting the significant findings and recommended actions in order of importance should be limited to 20 pages. Detailed information, baseline data and methods of assessment should be included in a separate volume as a technical annex to the main report. While the final assessment report is theproperty of the borrower, the World Bank encourages its release to appropriate interested parties. For Category A projects a draft report must be made available for consultation by project-affected groups and local NGOs. The World Bank stresses that review of the assessment should be undertaken by the borrower and the Bank to ensure that the assessment has fulfilled the requirements of the terms of reference and those of the World Bank and the country in question. In addition iterative review by the borrower ensures that the assessment continues to focus on key issues. The World Bank has no bespoke review mechanism, however the directive and sourcebook (World Bank, 1989 and 1991a,b,c) provide a brief checklist from which two issues are noteworthy:

- Adequacy of the executive summary, bearing in mind that decision-makers may only read the executive summary. It must therefore present details on the significant impacts, methods of mitigation, monitoring and supervisory requirements;

- Provision for community involvement – efforts should have been made to elicit local views on the project and incorporate these into the project planning process.

The World Bank suggests that the requirements of supervision of the environmental aspects of the project should be included within the assessment with compliance with environmental conditions, the status of mitigatory measures and the findings of monitoring programmes identified as part of the reporting requirements and project supervision. The World Bank also includes within the directive provision for ex-post evaluation to allow strengthening of the whole assessment process. Following project completion details of the impacts which actually occurred together with a determination for each as to whether or not it was identified within the assessment should be prepared. As this ex-post evaluation is also carried out for non-environmental impact assessment projects this allows for review of the screening process. Additionally details are required on the effectiveness of mitigation measures.

In addition to cross- or multi-sectoral guidance on the implementation of the environmental impact assessment process the World Bank has also provided a series of sectoral guidelines for World Bank staff in their role as facilitators in the environmental impact assessment process. Guidelines are provided for natural forest management and plantation development/reforestation as two project types from a wide range of cross-sectoral projects. These guidelines provide descriptions of potential impacts together with suggested mitigatory measures, project alternatives, management and training requirements and monitoring programmes. While the coverage within these guidelines is comprehensive they are by no means exhaustive and provide an aide memoir of issues which may or may not require attention during the an assessment.

The World Bank stresses that assessment should be closely integrated with the project's economic, financial, institutional, social and technical analyses to ensure that environmental issues are given equal priority in project decisions such as siting, selection and design. In addition the Bank emphasises that only through adoption of the process of environmental assessment throughout the life of the project planning stage beginning from the first point of project inception, will the full benefit of environmental impact assessment be recognised. Rees (1999), and Francis and Jacobs (1999) note that while considerable progress has been made in adopting environmental impact assessment into the Bank's practice there is still room for improvement in terms of strategic level assessments and making use of the information arising from individual assessments in project management.

2.9.2 The European Commission

Within the member states of the European Commission environmental impact assessment has

been governed through the national implementation of Directives 85/337/EEC and 97/11/EC. However the European Commission is also responsible for a wide range of development projects throughout the world, these are advanced through the European Commission's development co-operation policy at the heart of which lie the aims of sustainable development and the enhancement of natural resources (EC, 2000a). The European Commission has developed three general principles for forest sector development co-operation; the avoidance of harmful effects on the environment (including biodiversity), the enhancement of the environmental resource base and maintenance for future generations, and the determination and valuation of environmental costs and benefits. The European Commission uses four categories to assess the impact of forest sector programmes or projects (EC, 2000a). The categories are purposely nebulous and are issued only as guidance for European Commission staff when deciding which projects should be subjected to environmental assessment and which do not require additional scrutiny.

> *Category I* – projects which are specifically designed to improve environmental quality for example environmental education and training, watershed management, wildlife management.
>
> *Category II* – projects may not or do not have any significant environmental impact for example general education and training, institutional strengthening, research.
>
> *Category III* – projects which may have or have a moderate adverse impact on the environment for example forest-related research in sensitive or protected areas.
>
> *Category IV* – projects which may have or have significant adverse impacts on the environment for example large-scale plantations with mechanised harvesting.

The recommended procedures for environmental appraisal in forest sector developments draws heavily from guidance, manuals and checklists prepared by other Directorates General. In particular guidance on screening and scoping (EC, 1995a and 1995b) and the review checklist (CEC, 1996a) are utilised together with the Environmental Integration Manual (EC, 2000b). Further, the guidance suggests that most if not all projects will result in some level of impact. The decision on whether or not any potential impacts are significant will determine the necessity for environmental impact assessment. This decision should encompass the views of the competent authority and any other affected body or individual, the magnitude of any resulting change and the potential for mitigation, the sensitivity and extent of the receiving environment (social, natural, cultural), and the extent to which legal standards or policy objectives would be compromised. The guidance (EC, 1995a) notes that for screening to be effective proponents must be aware of the environmental impact assessment process (and already have incorporated it in their planning cycle) and the competent authority must be able to advise the proponent from an informed position. The guidance includes an extensive checklist

of screening questions within four topics (EC, 1995a):

- Project related factors – characteristics, methods, emissions, wastes, noise, hazards, social;
- Location related factors – characteristics, designations, landscape, ecology, stability, land use;
- Impact related factors – land and property, erosion, ecology, air quality, landscape, social and health;
- Wider considerations – controversy, transboundary, irreversible impacts, policies, risk, cumulative impacts.

The checklist is designed for cross-sectoral use. However it can easily be adapted for use in specific sectors with the inclusion of additional specialised questions. The guidance suggests that the checklist should be completed based on existing information and that additional studies or investigations are not appropriate at this stage. In addition, while the competent authority is the obvious primary user of the checklist, it may be useful for the proponent and other parties involved in the screening decision to complete the checklist. The liaison between competent authority and proponent on potential issues and concerns is seen as vital within the screening process, together with consultation with other competent bodies responsible for the environment. In addition provision should be made for dialogue with the public, NGOs and reputable experts or specialists to ascertain their interest in issues or concerns associated with the proposal. The guidance also suggests that experiential learning should be utilised wherever possible through the review of completed environmental impact assessments for similar projects or projects within the same location.

The European Commission's guidance on scoping (CEC, 1995b) suggests that in addition to identifying which issues should be addressed during the assessment, scoping can also identify the types of alternative projects which should be examined, the range of mitigation measures which should be investigated, the type of information required from baseline studies together with the form of survey work which may be required. In addition scoping should be utilised to establish which methods should be used to predict the magnitude of impacts and discuss the criteria through which the significance of impacts can be determined. Scoping can also be used to gather information on the level and range of consultation that should take place during the assessment, including local groups and individuals affected by the proposal.

Scoping can be carried out by the proponent, the competent authority or an independent body. However, best practice would suggest that scoping is most effective when contributions are received from a wide range of disciplines and interests. In addition to knowledge about the project for scoping to be effective those involved in the process should also have knowledge

about the site and have an understanding about the process of environmental impact assessment, relevant legislation and the decision making process. However scoping is carried out, it will not bring maximum benefit to the assessment if the results of the scoping process are not adequately recorded and considered when planning the assessment (EC, 1995b).

While the exact combination of impacts will be different for every project the guidance (EC, 1995b) includes two checklists which assist in the identification of primary, secondary and other impacts. The guidance suggests the use of two checklists, one dealing with project components and the other environmental elements. This approach is similar to the use of matrices where issues can be formulated through identification of project components which appear to give rise to a number of impacts or environmental elements which are repeatedly impacted or sensitive to interference. Again the number and range of individuals and organisations that are involved in this process is crucial to successful scoping, in order to avoid potential impacts being missed by the scoping exercise. However it is normal practice to have a core scoping group, it is therefore essential that suitable mechanisms are provided for affected parties and other interested organisations to access the scoping process. In order for this process to work effectively it must be a two-way exchange of information. The information gained from stakeholder consultation will only be optimised if stakeholders are aware not only of the proposed project and its environment but also the environmental impact assessment process, including the role of scoping, and also the role of the assessment as a whole within the decision making process. The methods through which this two way exchange of information can be achieved include questionnaires, mail-shots, public meetings, focus groups and multi-media advertisements. However it is essential that the methods used are designed to meet the requirements of the individual situation, therefore the use of a number of methods may be appropriate. In addition it is crucial that consultees receive feedback from the process in order to build confidence in the process and encourage further participation. This could be done through communication with each consultee or through the issue of a scoping report giving details of the focus of the assessment and how this approach has been arrived at.

An effective consultation process may result in a wide range of issues and concerns being raised by stakeholders, however the process of scoping must determine which of these issues will result in potentially significant adverse impacts and therefore should be included in the assessment, and which will result in non-significant adverse impacts and therefore can be omitted from further investigation. The European Commission guidance (EC, 2000b) avoids providing a definition of significance, but suggests that significant impacts are likely to be considered as those most important during decision making, and those about which there is most uncertainty. Thus in addition to considering impact duration, reversibility and magnitude

scoping should also consider the following when adjudging potential significance:

- Receiving environment – value, sensitivity, existing level of impact;
- Legislation and policy – non-compliance, contravention;
- Awareness – public, political;
- Uncertainty – lack of knowledge, lack of information.

As suggested during the screening stage, the review of existing projects and environmental impact assessments of projects of similar nature or in similar sites can be a useful source of information especially when adequate monitoring has been carried out. During scoping it is important to review the range of alternatives which may have been considered in the project planning phase, and examine the decision path which resulted in the proposed project, in order to identify any further alternatives or amendments which could be considered which would reduce the impact of the project.

Thus, in addition to identifying which issues should be addressed during the assessment, scoping provides the foundation upon which an open and impartial assessment can be carried out. Delays in project approval due to debate on the merits of baseline survey, impact prediction and impact evaluation methods used can be avoided if these issues are fully addressed during the scoping phase and consensus reached on the techniques that should be employed by those involved in scoping. In addition scoping can also identify stakeholders from whom it is important to solicit views and concerns. Further, scoping can also be used to define schedules for progressing the assessment and identifying fields of expertise required for survey or analysis work. However it should be understood that scoping is rarely a one-off stage, rather it is constantly redefined throughout the assessment process as information gathered is used to refine and redefine the suite of issues that should be addressed within the assessment.

2.9.3 The Department for International Development

The UK's Overseas Development Administration (ODA), now the Department for International Development (DfID) has had a policy of including environmental impact assessment within its project planning process since the 1980s. All projects had to account for environmental factors through all stages of planning and implementation. The Overseas Development Administration's manual (ODA, 1996) included a series of principles which called for the ODA to retain responsibility for ensuring that a multidisciplinary appraisal which addressed economic, social, ecological, legal and technical issues with due weight given to all elements was carried out prior to project approval. By the 1990s the ODA was already used to employing the project (logical) framework as an aid to planning, and developed a three tier system of appraisal which included:

- Initial screening – the first and most simple level of assessment which registers 'danger signals' and avoids unnecessary investigation where impacts are likely to be minimal;
- Environmental appraisal – intermediate level of assessment which predicts main impacts through the use of sectoral checklists, and assesses the importance of potential effects together with indicating possible key mitigating measures;
- Environmental impact assessment – the most rigorous and specific form of assessment which predicts in detail likely impacts including cost implications together with the identification of specific mitigatory measures.

At the core of the system is an environmental checklist for the decision maker the questions in which are designed to demonstrate that proper consideration has been given to environmental issues at the appropriate stage in the planning cycle. The process can be iterative with the decision-maker using the checklist and deciding that in order to achieve satisfactory answers to all of the questions a higher level of appraisal is required. The main elements of the checklist are:

- Impact identification:
  - Does the project have an impact on sensitive areas?
  - Are impacts clearly identified and evaluated?
  - Have secondary impacts been addressed?
- Mitigation measures:
  - Have alternatives and mitigatory measures been adequately addressed?
  - Have the experiences from similar projects been incorporated in the project?
  - Have stakeholders been involved in the process and have their views been adequately addressed?
- Procedures:
  - Have all relevant guidelines been taken into consideration?
  - In which stages of the decision making process has the assessment been included?
  - How have the effects of the project been integrated into the economic analysis of the project?
  - Have appropriate recipient country authorities been involved in the assessment and approved the measures to be taken?
- Implementation:
  - Do recipient institutions require strengthening to make the environmental elements effective?

- How will monitoring be carried out during and after project implementation?
- Have the environmental measures been costed and adequately provided for?

The manual does not provide a list of project types for which the completion of an environmental impact assessment is mandatory. The approach to screening is to treat each project on its individual characteristics and therefore projects are viewed in relation to a number of checklists. However it is also policy to comply with relevant legislation and guidelines within the recipient country and where no legislation or guidelines exist these should be developed at the most appropriate level which may include determination on whether or not UK or EC standards are most applicable. Screening is focused around four general checklists which identify issues and situations which generally require some form of appraisal; project location, project type, potential effects on the environment and potential severity of impact. The manual suggests that if the project registers any of the impacts discussed in the checklists further reference to expert opinion should be sought which can include discussion with local specialists and local communities. The manual does not suggest which of the three levels of appraisal should be initiated proposing that the more times a project registers potentially significant impacts within the checklists the more substantial should be the assessment.

The manual identifies forests and tropical forests in particular as a special habitat and provides guidance on the important aspects of sustainable development of natural forests. Forest management is provided an individual checklist in a series of annotated sectoral checklists which are designed to provide more focused attention of potential impacts. In addition the manual provides an outline of the second tier environmental appraisal which should include a précis of the initial screening results including the main areas of potential sensitivity together with identification of main impacts through the use of the annotated sectoral checklists. The appraisal should also include an assessment of the importance of potential effects through quantification, attaching monetary values or applying objective judgements, together with a consideration of the extent mitigatory measures meet these effects before coming to an overall judgement on whether or not the project can proceed. On the implementation of a full environmental impact assessment the ODA manual provides general guidance covering the major stages of scoping, impact prediction and evaluation, mitigation and monitoring. The manual stresses the linkages between the three levels of assessment initial screening, environmental appraisal and environmental impact assessment, and these should not be viewed as three separate processes. Rather the philosophy of environmental impact assessment is embedded in the project from initial inception and that the three tiers of investigation are a cost effective manner to allow the level of scrutiny to expand to meet the potential level of impact as the project progresses through the planning cycle.

2.9.4 The International Association for Impact Assessment

In 1994 the Canadian Environmental Assessment Agency and the International Association for Impact Assessment collaborated in the preparation of a study of the effectiveness of environmental assessment on an international level (CEAA, 1997). Through a series of surveys the status of environmental impact assessment practice was gauged through wide sampling of professional opinion. Responses suggested that the environmental impact assessment process up to the point of decision making was considered to be performed satisfactorily or better and while there were variations in the performance none of the elements of the environmental impact assessment process stood out as being particularly well or poorly carried out. However it should be noted that more than 25% of respondents felt that screening, baseline studies, scoping, impact prediction, impact evaluation, mitigation, public participation and environmental impact statement review were carried out to a standard which was less than satisfactory. Within this less than inspiring response the greatest reservations concerned public participation with one-third of respondents rating it as performed less than satisfactorily. Within post-decision elements the standard of assessment practice is considered to be generally poor. The standard of monitoring was considered to be less than satisfactory by 56% of respondents and similarly unpromising responses were received for surveillance of conditions of approval (50%) and management of impacts (44%).

Respondents were also asked to give their views on the effectiveness of environmental impact assessment in terms of the provision of information for the decision making process and the extent to which environmental impact assessment influenced decision making. The process was seen as moderately successful or better by the majority of respondents in including a full range of pertinent issues, identifying suitable mitigation measures and in the provision of appropriate information to decision makers on the potential consequences of development proposals. However practice was seen as being only marginally successful or not successful by the majority of respondents in making precise verifiable predictions, giving confidence levels for impact predictions, specifying the significance of any residual impacts and the provision of advice to decision makers on viable alternatives. More than two-thirds of respondents felt that the process had been moderately or very influential in terms of ensuring that environmental considerations are fully taken into account and establishing terms and conditions for development approval. However over half of respondents felt that the process had marginal or no influence in ensuring that social factors are adequately taken into account in decision making.

The overall perceptions of the benefits of the environmental impact assessment process were also included within the survey. While 70% of respondents felt that the overall results of the

process contributes always or often to more informed decision making and 54% of respondents gave similar responses in terms of the process preventing environmental damage or social losses that would be lost without assessment. However the process is seen as being less useful in minimising impacts to minimal levels, avoiding irreversible changes and ensuring that development is on a sustainable basis, with 33% and 18% respectively of respondents suggesting the benefits of the process were always or often realised. Respondents were also asked whether or not the benefits of the assessment process outweigh the costs of application. While 49% of respondents felt that the benefits always or often outweighed costs, almost one fifth of respondents felt that the benefits of the assessment process seldom or rarely outweighed the costs involved in its application.

In conclusion, the CEAA survey suggested overall that environmental impact assessment can be considered as performing satisfactorily in terms of the adequacy of institutional arrangements, the scientific and methodological base and its contribution to decision making. However it should be borne in mind that satisfactory is seen as the middle grade on a five-point scale and therefore suggests that improvements can be made. On the conduct of assessments, the study gives no overall grade but notes that pre-decision performance is better than satisfactory, but post decision performance is of a standard below that which could be considered as satisfactory. The study suggests that the results should be tempered with the knowledge that aggregate results mask considerable variation and that it was felt that there was a high level of self-criticism among respondents. However the results highlight that although there has been a considerable improvement in the standard of environmental impact assessment practice, over the preceding five-year period, there is still considerable room for further improvement.

2.10 Chapter Summary

The process of environmental impact assessment now has over thirty years of practical experience since its establishment in the late 1960s in the USA. Despite difficult early experience the process has developed into a credible and effective management tool. An increasing number of governments are introducing environmental impact assessment legislation, and in many organisations the process has been embedded in the project planning cycle. Despite reservations in the UK regarding the necessity for, or desirability of, introducing the European Commission's environmental impact assessment requirements, within many sectors, environmental impact assessment is seen as a worthwhile process by both planners and proponents alike.

The British forest sector now has over twelve years experience of environmental impact assessment and legislation has gone through two major revisions in the past three years. While there is no set format to environmental impact assessment best practice suggests a number of

typical stages and stresses the iterative nature of the process. International best practice highlights the importance of scoping in ensuring assessments focus attention on key issues and the environmental statement review process in promoting the quality of assessment and the provision of information to the decision-maker. One of the strengths of environmental impact assessment is the ability of the process to match the requirements of the proposal or issue in terms of the depth of investigation required. Through this, attention can be focused only where it is required. However to allow this to be utilised fully requires that all parties involved in the process are adequately experience in the assessment process. The value of guidance for the competent authority, the proponent and other actors such as key stakeholders should not be underestimated. The review of environmental statements is seen as a key element in the assessment process. Acting as a check on the quality of environmental statements the review process can be a systematic approach for competent authorities to separate acceptable from unacceptable assessments. Recent studies illustrate an overall improvement in quality of assessments but highlight the need for further improvements in the process including the need to achieve greater public involvement within the process.

Key issues for the development of the assessment process within the forest sector and improving the quality environmental impact assessments and environmental statements are seen as:

- Ensure that environmental impact assessment is an integral part of project planning and not just an add on;
- Operate a systematic methodology for screening proposals for assessment;
- Scoping should be carried out with as wide a range of participants and as early in the project cycle as possible. Scoping should not be restricted to the identification of potential impacts but also look at assessment methods and determination of impact significance;
- Environmental impact assessments should not stop at the end of the project 'construction' phase but carry on through an appropriate monitoring plan. This is particularly necessary where there is uncertainty or risk.

The next chapter investigates the level of afforestation work in Great Britain and the level of environmental impact assessment activity in the forest sector since the introduction of specific forest sector environmental impact assessment legislation in 1988.

CHAPTER 3 THE FOREST SECTOR IN GREAT BRITAIN

3.1 Introduction

Within this chapter the background to the role of the Forestry Commission as both the promoter of an expansion of forestry within the country, and the body responsible for the regulation of the environmental impact assessment process within the forest sector, is introduced. The systems and procedures through which the Forestry Commission regulate afforestation proposals and administer the environmental impact assessment process are described. Finally an overview of the level of afforestation during the period 1988 to 1998, together with a description of the extent of environmental impact assessment over the same period is given.

3.2 Background of the Forestry Commission

3.2.1 The Role of the Forestry Commission

The statute law governing forestry is principally contained in a single enactment, the Forestry Act 1967 (Halsbury, 2000). The Forestry Commission is the Government department responsible for advising forestry Ministers on forest policy and implementing forest policy in Britain. Set up in 1917, the Forestry Commission has a statutorily appointed board of Commissioners with duties and powers defined in the 1967 and 1979 Forestry Acts. The Board of Commissioners consists of a Chairman plus up to ten other Commissioners who are appointed by the Queen on the recommendation of Ministers. Within the 1967 Act the Commissioners are charged with the development of afforestation and management achieving a reasonable balance between forests and conservation. The Forestry Commission's mission is to protect and expand Britain's forests and woodlands and to increase their value to society. Within this mission (Forestry Commission, 1992) the objectives are:

- To protect Britain's woodlands
- To expand Britain's forest area
- To enhance the economic value of the forest resource
- To conserve and improve the biodiversity, landscape and cultural heritage of forests and woodlands
- To develop opportunities for recreation
- To increase public understanding and participation in forest and woodlands.

The Forestry Commission's headquarters are located in Edinburgh, with national offices in Edinburgh, Cambridge and Aberystwyth. Each national office is served by a number of conservancies; six in Scotland, seven in England and two in Wales.

The Forestry Commission has a number of roles in the forest sector. A major reorganization in

April 1992 separated what had been until then the unitary Forestry Commission into two separate bodies, the Forestry Authority and Forest Enterprise. A second reorganisation in 1996 set up the existing structure of the Forestry Commission as Government department with two executive agencies, Forest Enterprise and Forest Research. Following the initiation of the Welsh Assembly and the Scottish Parliament in 1998 although the Forestry Commission remains the Government Department with responsibility for forestry within Great Britain, individual forest strategies for England, Scotland and Wales promote development attuned to national requirements (Forestry Commission, 1999a).

The Forestry Commission is responsible for implementing the Government's forest policy through advice, incentives and regulation and for setting standards which apply to trees, woodlands and forests in Britain. Along with encouraging marketing and education the Forestry Commission has two functions which heavily influence the extent and form of British forestry: support for private woodlands and, control and regulation. The Forest Enterprise is responsible for the management of the Forestry Commission's forests as productive and environmental assets. Forest Research is responsible for providing research and survey information to assist the development of policies and practices including that of sustainable forest management. Felling controls are administered by the Forestry Commission to afford protection of forests from unnecessary damage, and to encourage forest management using sound management techniques. In addition the Forestry Commission will give advice to woodland owners on woodland management issues and is responsible for the publication of management guidelines and best practices, and the dissemination of these throughout the forest sector.

3.2.2 Forest Policy

For a number of years successive UK Governments have made a commitment to the creation and management of forests and woodland as a renewable natural resource. To encourage the management and expansion of private forestry which provide opportunities for multiple use, and public benefits the Forestry Commission provides grant assistance through the Woodland Grant Scheme (Forestry Commission, 1992). In 1991 the Government expressed its forestry strategy in Forest Policy for Great Britain (Forestry Commission, 1991). This document set out the long term aims and objectives of the Government's forestry policy. Under the aegis of multiple use forestry the main aims were:

- The sustainable management of existing woods and forests
- A steady expansion of tree cover to increase the many benefits that forests and woodlands provide.

The policy confirmed the Government target of 33,000 ha of new planting annually "for the

foreseeable future", and the Woodland Grant Scheme as the means of encouraging this expansion. Following the 1992 United Nations Conference on the Environment and Development, and the 1993 Ministerial Conference on the Protection of European Forests and the commitments undertaken by the UK Government, forestry policy was further strengthened by the adoption of an agenda that would promote sustainability through Sustainable Forestry– The UK Programme (The Forestry Authority, 1994). The UK Biodiversity Action Plan (DoE, 1994) sets out a programme to conserve and enhance biological diversity in the UK. It clearly states that forestry is expected to improve habitat through wider diversification measures in forests and woodlands. It comments that afforestation should be avoided on valuable open habitats. While Resolution 1 of the Helsinki Guidelines, is primarily focused on the sustainable management of forests in Europe it clearly states that this should not be to the detriment of other natural resources and encourages conservation and appropriate enhancement of biodiversity, while giving due regard to the protection of ecological fragility. The value of environmentally sound forest expansion is recognized and suggests that afforestation should be conducted in a manner that does not negatively affect ecologically interesting or noteworthy sites and landscapes.

3.2.3 The Introduction of National and International Standards

The UK Forestry Standard (The Forestry Commission, 1998a) and the three national standards, set principles and measures for the sustainable management of forests and woodlands in Great Britain and Northern Ireland, supported by instruments such as the Woodland Grant Scheme, Felling Licences and Environmental Impact Assessment Regulations. Central to this is the realization that the process of forest management and afforestation decision making should be fully cognizant of the attendant legal, social and environmental context. In the standard, the Government expands on previous definitions of sustainable development by stating that it involves looking after our natural resources so that future generations can also enjoy it. The standard also pushes the international role of the UK as a leader in best environmental practice with a special responsibility; that the UK must have the highest standards of forest management in a domestic context if it is to have any authority or credibility in an international setting. Standard Note 2, covering the creation of new woodland offers that some proposals may cause adverse environmental, agricultural or other economic impacts not outweighed by potential benefits. The standard also recognizes the fact that the Government's existing forest control instruments do not require woodland owners or proponents of afforestation schemes to discuss plans and proposals directly with local communities. These instruments do, however suggest that dialogue should take place where and if possible. The standard later emphasizes the potential enhancement of benefits and reduction of conflict that may arise from increased public participation.

Voluntary codes of practice such as those of the UK Woodland Assurance Scheme and the Forest Stewardship Council require that conservation of biodiversity and natural resources lies at the heart of forest management and that key heritage and landscape resources must be sustained. Such codes of practice call for the processes of environmental assessment and environmental appraisal to be carried out in a manner appropriate to the scale of operations and the sensitivity of the site are important techniques and be incorporated into the management decision making process. The Forest Stewardship Council's Principles and Criteria (FSC, 1993) has at its heart Principle 6, concerning environmental impacts. This is in fact the largest and most detailed section of the Principles and Criteria and deals with all forest management planning and implementation and control of forest operations. The Principles and Criteria call for all forest plans and operations to be appraised at a level appropriate to the scale of operations and the sensitivities of the site, intimating that no plan or operation should be implemented before adequate appraisal of the consequences of such action.

There have been situations where both central and local Government have indicated that particular types of afforestation or afforestation in particular areas is undesirable or inappropriate. Examples of this are policies for protecting Class A1 agricultural land and active blanket and raised bogs. Other methods such as the Character Map of England or the Scottish Landscape Character Assessments can identify areas containing particular features which require sympathetic design or areas within which woodland would be out of character. Local Authority Structure Plans can provide guidance on non-statutory designations, for example Local Nature Reserves, and may identify local planning preferences. Some local authorities, such as Strathclyde Region (Goodstadt, 1990) have developed Indicative Forestry Strategies (IFS) which classify areas according to their sensitivity to, and potential for, afforestation. On a local-regional scale Indicative Forestry Strategies identify those areas where new planting was to be preferred or where special consideration would be needed before planting proposals were accepted. While the history of forest development planning in Great Britain can be seen as one of constant change with failed policies and resultant conflicts, Indicative Forestry Strategies have the potential to give clear direction. The Scottish Executive (1999d) identifies that a different situation now exists and calls for Indicative Forestry Strategies to be play a different role from that initially seen in the late 1980s. They can play a strategic role by being able to deal with cumulative and long-term impacts arising from decisions, taking a wider view rather than being wholly project focused. However to realise this their development must include a wider range of consultees and stakeholders. The new European Directive on strategic environmental assessment (CEC, 2001b) may provide a new focus on IFS and strategic planning within the forest sector as a whole. The Directive aims to protect the environment by requiring the consideration of environmental matters in the preparation of plans and

programmes. Eligible plans or programmes are those that are subject to preparation and/or adoption by an authority at national, regional or local level, or those prepared by an authority for adoption into legislation. The Directive follows on to identify the need for strategic environmental assessment of forestry plans and programmes which set the framework for future development consent of projects. The Directive allows 3 years in which Member States must bring in laws or administrative arrangements to comply with the Directive.

3.2.4 The Integration of Environmental Impact Assessment and the Woodland Grant Scheme

The combination of Woodland Grant Scheme and environmental impact assessment control was cited as ensuring that new woodlands were being properly designed and located (Forestry Authority, 1993). The procedures required for assessment of a proposal are carried out within the framework of the Woodland Grant Scheme. This is essentially a higher level of scrutiny triggered by the considered opinion of the Forestry Commission that a project may give rise to unacceptable environmental impacts, and requires the provision of information in addition to that normally submitted for entry into the Woodland Grant Scheme. An application, which is not subject to assessment, is normally initially handled by an officer of Woodland Officer grade, forwarded to an Operations Manager/Conservator for final checking and authorization. This could typically involve 15-20 hours processing by junior staff, including site visits, and 4 hours senior input for an 'average' Woodland Grant Scheme application. While the Forestry Commission management accounting system is unable to separate expenditure on individual applications, anecdotal evidence has been given to suggest the average processing cost of all Woodland Grant Scheme cases including those called for assessment is in excess of £1000/case (Forestry Commission, *personal communication*). This figure would appear to comply with overall expenditure of £5.6 million for management and administrative expenditure in the private Woodland Grant Scheme in the 1998-1999 Forestry Commission Accounts (Forestry Commission, 1999b). An application subject to assessment would typically require a moderate increase in junior officer input. However the role of senior officers is greatly increased, with the requirement to make the initial recommendation for assessment, conduct the initial Forestry Commission scoping exercise, assess drafts and the final environmental statement for acceptance into the Woodland Grant Scheme decision making process and consult with the appropriate statutory consultees. Similar anecdotal evidence suggests an application subject to assessment can require up to 40 hours of senior staff processing time (Forestry Commission staff, *personal communication*). In areas where a number of assessments are requested annually, environmental impact assessment processing may constitute a significant portion of senior staff time.

3.3 Application of Forestry Regulation

3.3.1 Forestry Commission Codes & Procedures

To promote consistent application of forestry regulations throughout the country, the Forestry Commission has produced a series of internal procedural guidelines to the Woodland Grant Scheme. The Grants & Licence Division Code, which identifies the Forestry Commission official policy and role in a number of common situations. This gives staff guidance on the Forestry Commission's obligations and refers to other documents giving details of guidelines or best practices for specific items. These codes are widely and frequently used by Forestry Commission staff when interpreting forestry legislation in individual cases. The procedural guidelines cover the steps to be taken with applications for grant aided afforestation schemes. The initial 1984 Ministerial Direction did not grant the Forestry Commission the power to dismiss an application for an afforestation proposal which did not comply with the environmental guidelines. Such a proposal would be presented for consultation and would have to progress through the system before it could be rejected. In an attempt to reduce wasted effort on proposals which were seriously flawed and would ultimately not be accepted for grant assistance the Forestry Commission was given the power to reject at any stage in the process a proposal which did not meet the environmental guidelines or in the opinion of the Forestry Commission would be likely to result in significant harm to the environment (Secretary of State for Scotland, 1996).

3.3.2 Consultation Procedures

The Ministerial Directive of 1984 required that before reaching a decision on an application to grant aid a scheme, a period of consultation should take place to ensure that the requirements of land use, agriculture, amenity, recreation and nature conservation were taken into account and conflicting interests reconciled. The consultees were to be drawn from Agriculture Departments, local planning authorities and other statutory authorities as appropriate to each individual case. For example, within Scotland the Scottish Office Agricultural, Environment and Fisheries Department was to be consulted for new planting proposals for areas over 40 ha, land capability class 1, 2 or 3.1 and where the area under proposal has been identified as being necessary to maintain a thriving sheep industry. Similar requirements were listed for Scottish Natural Heritage, English Nature, the Deer Commission Scotland and the Ministry of Defence. The Forestry Commission would not directly seek the views and opinions of voluntary bodies with an interest in a particular proposal, rather it encourages the statutory authorities to consult with these bodies.

The procedural guidelines outlined the process through which lodged objections to a proposal could be addressed. Initially the respective Conservator should attempt to make every effort to

address differences of opinion and move towards agreement. In instances where this failed to resolve differences the cases were to be referred to the Regional Advisory Committee. A review of consultation procedures for planting and felling proposals suggested by the Environmental Select Committee revealed that consultation was carried out in the vast majority of cases but this process added little new information to the decision making process. Thus the Government decided to amend the consultation process with a view to making the process less bureaucratic, allow more public involvement and generally reduce the time taken to process applications. The ability to implement this arose from:

- An improved Woodland Grant Scheme with multiple-use goals;
- A series of environmental guidelines;
- The use of indicative forestry strategies by local planning authorities to indicate where afforestation proposals would be encouraged and areas where proposals would be subject to close scrutiny;
- The introduction of a public register of planting proposals (including access via the Internet) which would allow the general public to make representations direct to the Forestry Commission on any proposal;
- The introduction of forestry standards used as a basis for monitoring environmental standards in managed woodlands;
- The introduction of environmental impact assessment legislation which subjects large or sensitive afforestation proposals to detailed assessment.

From 1 August 1996 consultation was to take place with the relevant statutory bodies when:

- Afforestation proposals that affect a National Nature Reserve, Site of Special Scientific Interest, Special Protection Area or Special Area of Conservation - with English Nature/Scottish Natural Heritage/Countryside Council for Wales;
- Afforestation proposals that affect a Scheduled Ancient Monument - with English Heritage/Historic Scotland/Welsh Historic Monuments;
- Afforestation proposals greater than 5 ha inside a National Scenic Area or Heritage Coast – English Nature/Scottish Natural Heritage/Countryside Council for Wales;
- Afforestation proposals greater than 10 ha - the local planning authority concerned.

3.4 Expansion of the Forest Estate within Great Britain

3.4.1 Afforestation Figures 1988-1998

During the period 1 April 1988 and 1 April 1998 a total of 22,003 afforestation projects were approved for entry to the Woodland Grant Scheme within Great Britain (Forestry Commission, 1998b). Considering the number of applications this is broken down to 7,126 schemes in

Scotland, 13,455 schemes in England, 1,422 schemes in Wales. If one considers areas of afforestation proposals this gives figures of 116,579.9 ha, 38,900.23 ha, 4,255.88 for Scotland, England and Wales respectively. This distribution of schemes is shown in Table 3. From these data the average afforestation proposal size can be calculated.

Table 3. The distribution of Woodland Grant Schemes within Great Britain between 1 April 1988 and 1 April 1998 (FC, 1998b).

Country	Number of schemes	Aggregate area (ha)	Average area (ha)
England	13455	38900.23	2.89
Wales	1422	4255.88	2.99
Scotland	7126	116579.90	16.36
Great Britain	22003	159736.01	7.26

During the period 1988 to 1998 annual private planting averaged 16,057 ha per annum. This varied from a minimum of 15,700 ha in 1996 to a maximum of 19,700 ha in 1990. Government policy on the rate of expansion of the UK's forest estate has been unclear. However an annual target of 30,000 ha had been in existence since 1987. In effect, this target was in excess of actual planting figures despite the rapid expansion of afforestation previously in the early and mid 1980s. It can be seen that the majority of the area of new planting occurred in Scotland (Figure 7) and the relative proportions of afforestation between England, Scotland and Wales remained approximately constant. In addition a total of 20,400 ha have been afforested by Forest Enterprise over the period 1988 to 1998.

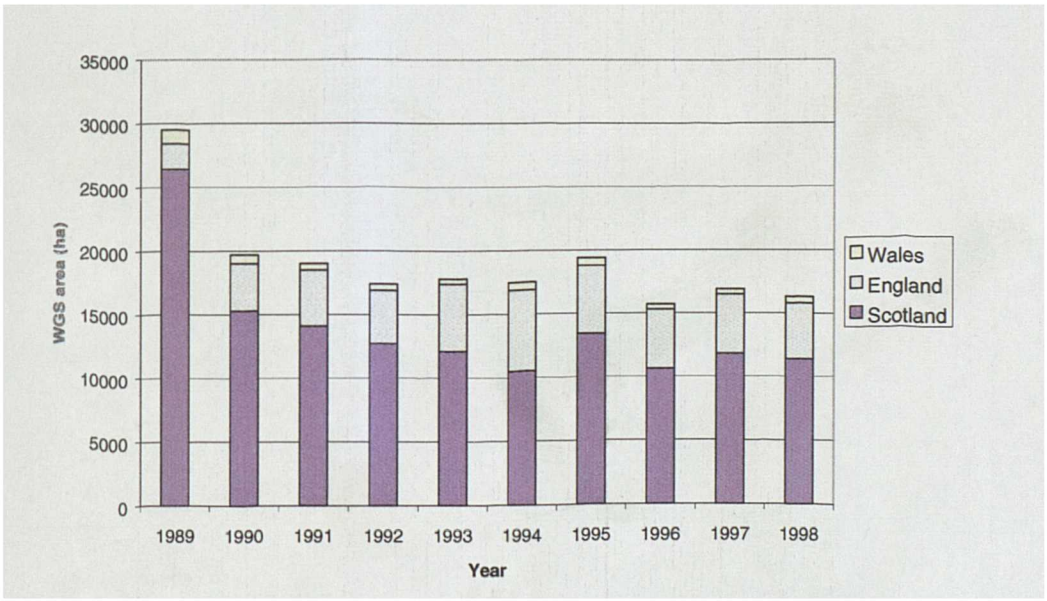


Figure 7. National afforestation rates 1988 to 1998 (Forestry Commission, 1991, 1998c).

3.4.2 Afforestation Within Scotland 1988-1998

While it has been possible to obtain from the Forestry Commission (Scotland) the database of all afforestation projects in Scotland from 1988 to 1998, it has not been possible to secure

similar data from the Forestry Commission national offices for England and Wales. The following information is therefore restricted to the Scottish conservancies. While it is unfortunate that data for the whole of Great Britain is unavailable this is not considered to be problematic due to the fact that, as will be shown in Section 3.5, the overwhelming majority of environmental assessment work within the forest sector has been carried out in Scotland with only three environmental statements being prepared in England and none prepared within Wales. Within Scotland over the period 15 July 1988 to 01 April 1998 it can be seen in Figure 8 that the number of afforestation projects accepted into the Woodland Grant Scheme has varied considerably from a low of 398 (part year) in 1989 and 516 in 1992 to a maximum in the following year of 1,019.

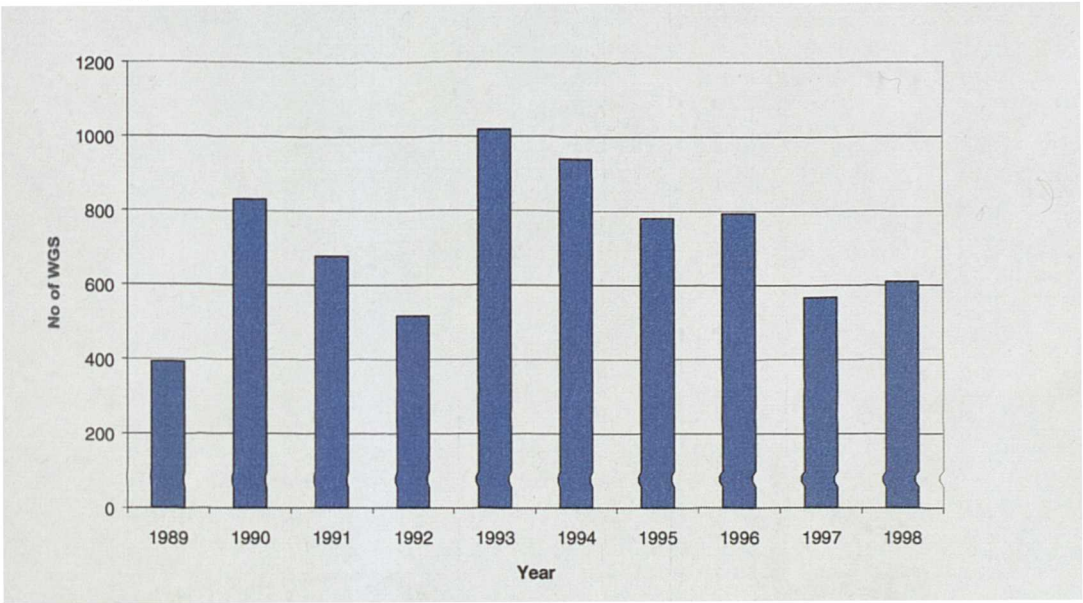


Figure 8. The total number of schemes accepted into the Woodland Grant Scheme in Scotland during the period 1988-98 (FC, 1998b).

Comparison of Figures 7 and 9 appear to indicate differences in annual afforestation rates. This can be explained by the fact that the data in Figure 7 is collated by accounting year while Figure 9 is collated by calendar year. Also Figure 7 shows total afforestation rates within both public and private sectors while Figure 9 shows only Private Woodland Grant Scheme aided afforestation in Scotland.

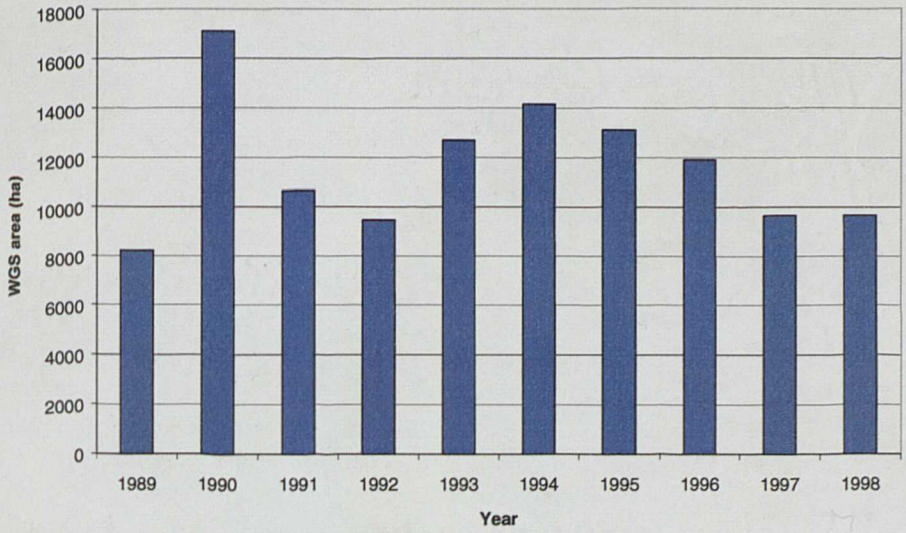


Figure 9. The area of afforestation schemes accepted into the Woodland Grant Scheme in Scotland during the period 1988 to 1998 (FC, 1998b).

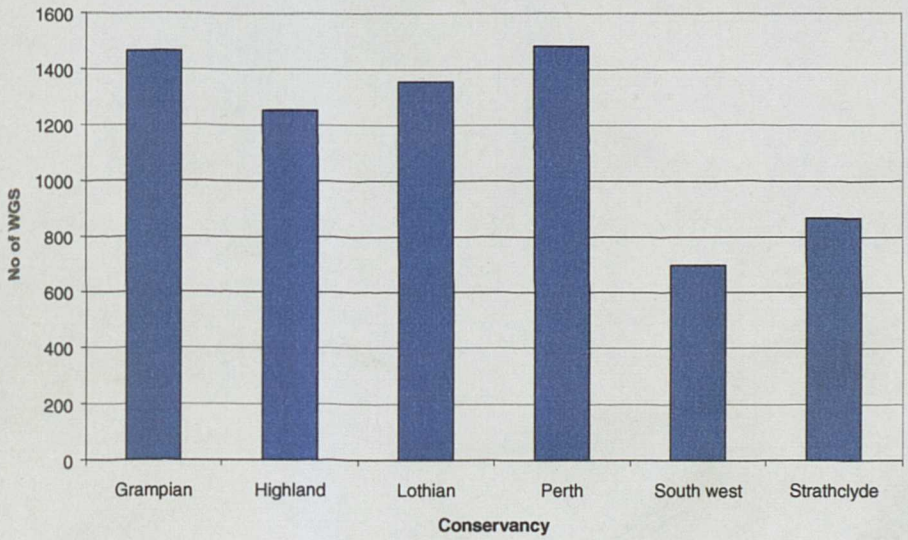


Figure 10. The number of afforestation projects accepted into the Woodland Grant Scheme by conservancy during the period 1988-98 (FC, 1998b).

3.4.3 The Scottish Conservancies

Comparison of Figures 7 and 9 illustrates that within the Scottish conservancies during the years immediately following the removal of tax incentives from afforestation projects in 1988 there was a reduction in the area planted from the maximum of 26,347 ha in 1989 (Scottish Office, 1998). The figures also show that generally within Scotland afforestation schemes decreased in area from an average in 1989 of 20.9 ha to 15.8 ha in 1998. However the average figures show a degree in variation. While the reduction in size of scheme ranged from 0.7% within Perth conservancy to 63% within Strathclyde conservancy, within the South-West

conservancy the average scheme size increased by 30% from 13.1 ha in 1989 to 17.0 ha in 1998. The data obtained from Forestry Commission (Scotland) also highlighted the growing area of broadleaves within afforestation schemes. At 1989 the broadleaved component of planting schemes accounted for 1,283.7 ha or 16% of the total area afforested in Scotland under the Woodland Grant Scheme. By 1998 the broadleaved component had increased to 4,867.9 ha or 50% of the total area afforested within Scotland under the Woodland Grant Scheme. In addition the number of schemes which were of purely broadleaved origin rose from 133, with a total area of 532.0 ha in 1989 to 230, totaling 1,373.2 ha in 1998.

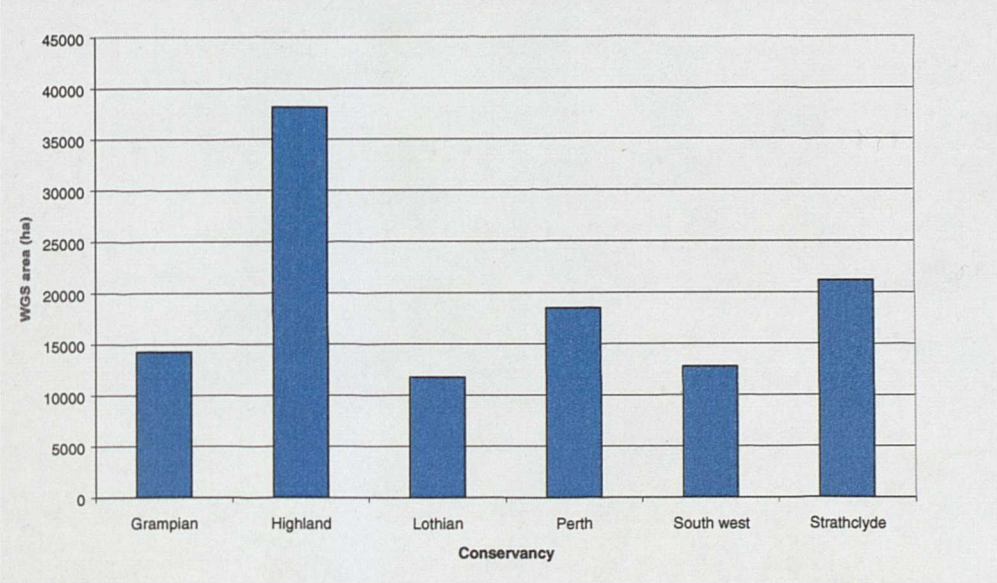


Figure 11. The area of afforestation projects accepted into the Woodland Grant Scheme in Scotland by conservancy during the period 1988-98 (FC, 1998b).

Comparing Figures 10 and 11 it can be seen that there is a far more irregular division of area planted between Conservancies than the number of schemes approved. Perth had the highest number of approved schemes but had only third highest planted area. Highland contained 18% of the number of schemes but contributed 33% of the afforested area. Using these figures is has been possible to estimate the average scheme size within each conservancy (Table 4).

Table 4. The number, area and average size of Woodland Grant Scheme project in Scotland during the period 1988-98 (FC, 1998b).

Conservancy	No of WGS	Area (ha)	Average area (ha)
Grampian	1474	14288.69	9.7
Highland	1268	38609.81	30.5
Lothian	1374	11848.57	8.6
Perth	1498	18652.81	12.5
South west	711	12837.87	18.1
Strathclyde	875	21244.30	24.3

Thus it can be seen that the Scottish conservancies all have WGS afforestation schemes with an average area in excess of the Great Britain average, with South-West, Strathclyde and Highland conservancies having average scheme areas more than double, three-times and four-times respectively that of the British average. Figures 12 and 13 illustrate the number and area respectively of afforestation projects accepted into the Woodland Grant Scheme by Conservancy during the period 1988-98, broken down into five size classes. It can be seen that across all Conservancies the vast majority of schemes are below 49.99 ha, with over 93% of all schemes in this class. However this class size accounts for only 29% of the area of afforestation schemes.

Taking all schemes up to 99.99 ha (the original threshold for triggering consideration of schemes for environmental impact assessment), 96% of the number of schemes are within this size, accounting for 44% of the area planted. This means that 267 schemes, some 4% of the total number of afforestation projects account for 56% of the planted area. There are 24 schemes over 500 ha in extent, however these account for some 15% of the total area planted within Scotland.

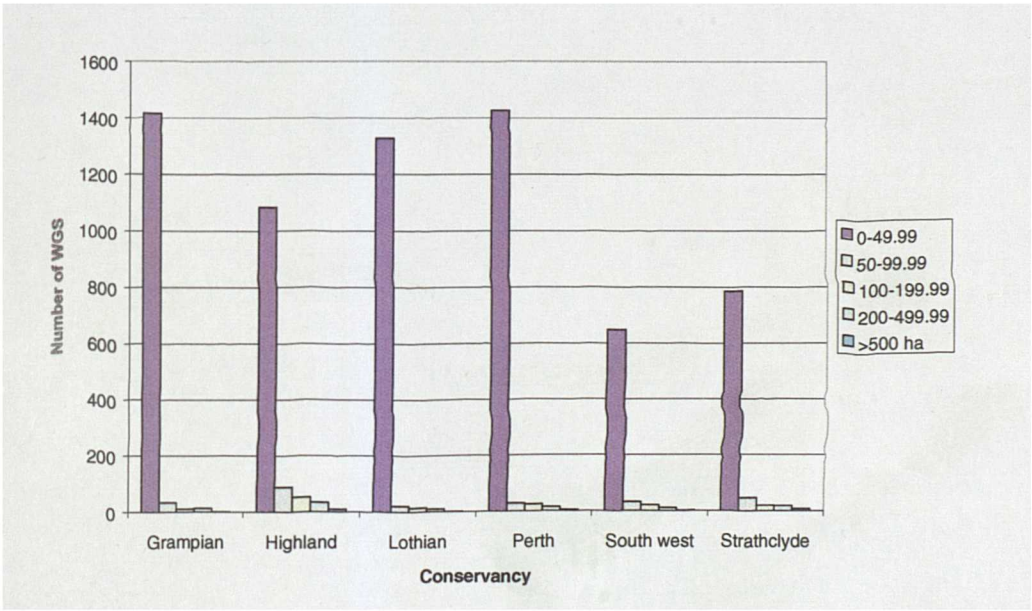


Figure 12. The number of Woodland Grant Scheme projects between 1988-98 by size class (FC, 1998b).

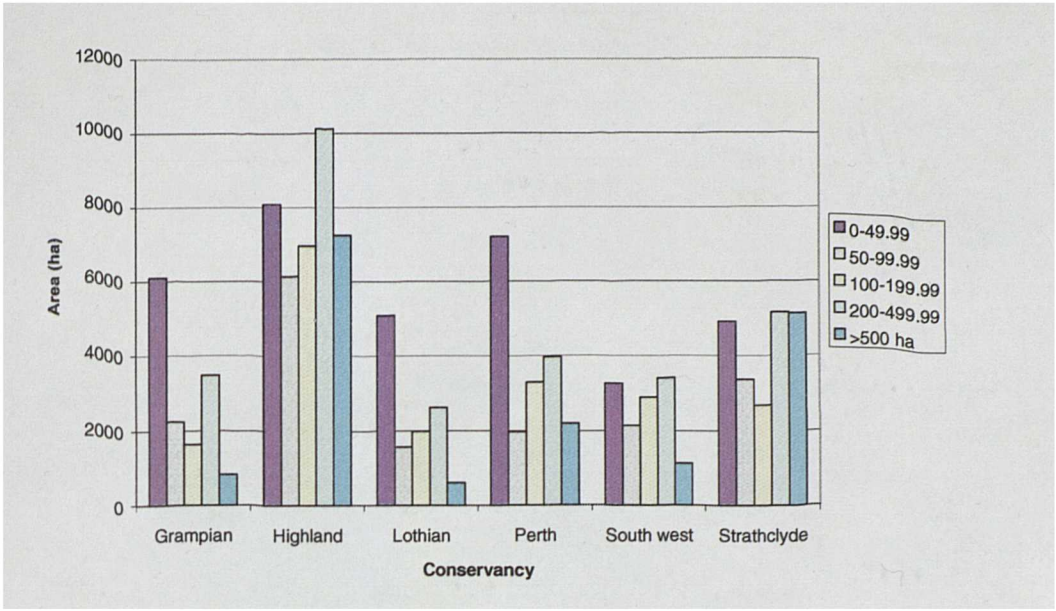


Figure 13. The area of Woodland Grant Scheme projects between 1988-98 by size class (FC, 1998b).

3.5 Environmental Impact Assessment in the Forest Sector

3.5.1 The Great Britain Situation 1988-1998

Between the period 15 July 1988 to 31 March 1998 a total of 211 Woodland Grant Scheme projects were called for assessment throughout Great Britain. The numbers of environmental impact assessments in the forest sector called for each year up to 31 March is illustrated in Figure 14. The full list of afforestation projects called for environmental impact assessment is given in Appendix 2.1.

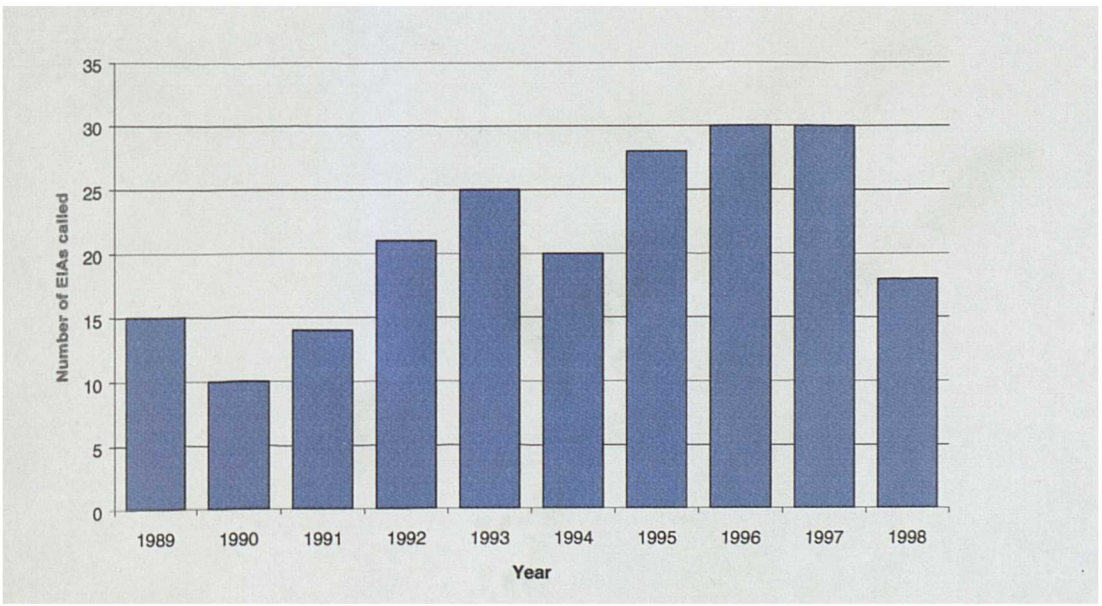


Figure 14. The number of environmental impact assessments called between 1988 and 1998 in Great Britain (FC, 1998b).

Within this total 205 environmental impact assessments have been called in Scotland, 6 in

England and none in Wales (Figure 15). Highland Conservancy accounted for almost half the total number called with 101 environmental impact assessments requested. Highland and Strathclyde Conservancies together made up two thirds of the total number called. Of the total number of assessments called, 209 schemes were in private ownership, only 2 were Forest Enterprise projects. For comparison over the period July 1988 to April 1998 a total of 3671 environmental statements were published within the UK across all sectors (Wood and Bellanger, 1999). Wood (2000a) noted that Scotland attained a high level of environmental impact assessment activity relative to its population with 547 environmental statements submitted due in part to the high numbers of afforestation and windfarm proposals being assessed. This constitutes some 15% of the UK total. Wood and Bellanger (1999) identified 51 published forest sector environmental statements. This is 50 statements fewer than has been identified for this research through the Forestry Commission database.

Comparison of Wood and Bellanger's (1999) directory with the Forestry Commission database used in this research suggests that of the 51 environmental statements noted only 35 had completed the assessment process, 6 had been withdrawn before final contract completion, 3 had been accepted by the Forestry Commission and were with the applicant before submission of the final application. Three cases were within Northern Ireland and not included within this study. A final 3 cases did not appear on the Forestry Commission database. The reason for the differences between these two data sets is considered to be the fact that Wood and Bellanger's (1999) directory is an amalgamation of environmental statements notified by local authorities and consultees. As will be discussed in Chapter 5 the involvement of consultees is variable within the forest sector and it is possible that consultees may not be aware of all cases called for assessment, especially where proposals are quickly withdrawn by proponents following the decision to call for an assessment. Therefore it is felt that there is no reason to question the reliability of the figures provided by the Forestry Commission for this research. The data provided by the Forestry Commission also closely correlates with that of Jones and Bull (1997). Over the period 1988 to 1994 both Jones and Bull (1997) and the Forestry Commission data identify publication of 85 forest sector environmental statements.

3.5.2 The Forest Sector in Context

Considering the overall figures the 101 completed environmental impact assessments identified in the Forestry Commission's database constituted approximately 3% of all assessments carried out in the UK. Focusing on Scotland there were 98 completed forest sector assessments from a total of 547 across all sectors. This constitutes approximately 18% of all Scottish environmental impact assessment activity and gives a similar estimate to that proposed in Gray (1996) and Gray and Edwards-Jones (1999). The level of environmental impact assessment

activity in the forest sector as a whole and in Scotland in particular is considerable and the Forestry Commission must be regarded as one of the most experienced competent authorities. There has been a general increase in the number of environmental impact assessments called within the forest sector over the period, however numbers called in 1994 and 1998 do not follow the general trend. This can be contrasted with a general reduction in the number of, and area covered by, afforestation projects over the same period as discussed in section 3.4.

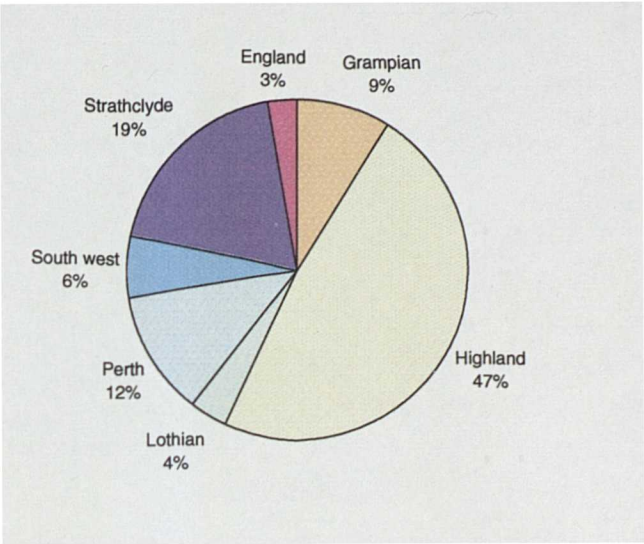


Figure 15. The location of Woodland Grant Scheme projects called for environmental impact assessment during the period 1988 to 1998 (FC,1998b).

3.5.3 Analysis of Environmental Impact Assessment Status

At 31 March 1998 from the 211 afforestation proposals (shown in Figure 16), 46 had been withdrawn from the Woodland Grant Scheme and assessment process by the applicant, 11 had the request for preparation of an environmental impact assessment withdrawn by the Forestry Commission. Three applications were with the Forestry Commission awaiting the result of the screening decision. The proponents of a further 4 projects had been notified that they would be required to prepare an assessment and the Forestry Commission was awaiting confirmation from the applicant that an assessment would be carried out. One scheme was awaiting the outcome of an appeal to the Secretary of State. A further 22 environmental impact assessments were being prepared and 6 had been drafted and were with the Forestry Commission for comment or were undergoing consultation. Eighteen schemes had presented environmental statements which had been accepted by the Forestry Commission and were undergoing subsequent amendment of the proposals effectively halting the projects from clearing the regular Woodland Grant Scheme process. One hundred afforestation proposals had presented an environmental statement which had been accepted by the Forestry Commission and the Woodland Grant Scheme had been subsequently approved. One scheme had presented an

environmental statement and subsequently had the project rejected from inclusion in the Woodland Grant Scheme.

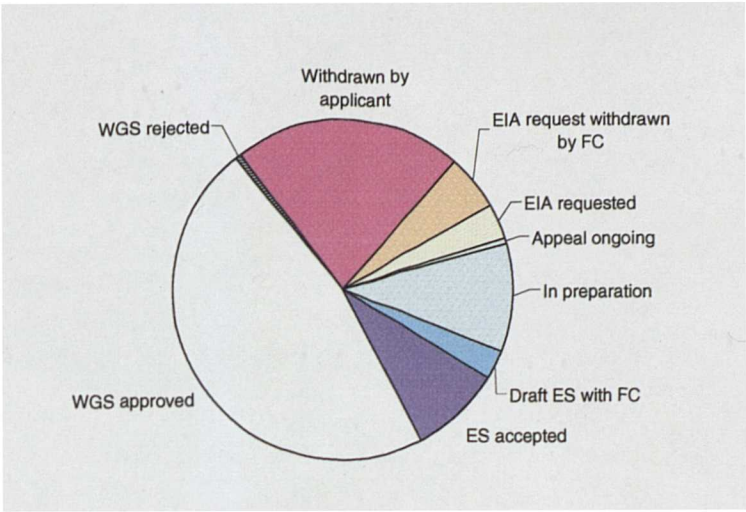


Figure 16. The status of environmental impact assessments within the forest sector at 31 March 1998 (FC, 1998b).

When the environmental impact assessment legislation came into effect in 1988 the Forestry Commission began to record the reason for calling environmental impact assessments using using a somewhat basic system with four categories of reasons for calling for assessment. These categories being where a project:

- Was located within Caithness & Sutherland;
- Was considered to result in potential impacts on a Site of Special Scientific Interest outwith Caithness and Sutherland;
- Was located near or within a Sensitive Area or Environmentally Sensitive Area;
- Was considered to result in potential impacts due to other reasons principally size, with an area in excess of 100 ha, or due to landscape impacts.

Of the 211 afforestation proposals required to undergo environmental assessment, 36 (17%) were requested on the grounds that they were located within Caithness and Sutherland. This special designation was due to the sensitivity surrounding afforestation in this area following rapid and widespread expansion in the 1970s and early 1980s. The rectitude and impact of this expansion has subsequently been questioned (Ratcliffe and Oswald, 1987). 44 (20%) were requested due to their location in or adjacent to a SSSI outwith Caithness or Sutherland. A further 39 (18%) proposals were located within a designated scenic area or ESA and were subsequently called for assessment. The largest number of proposed schemes 100 (45%), were

required to submit an assessment mainly by virtue of their extent or potential effect on the surrounding landscape. This final catch-all classification included potential impact on flora or fauna or impact on hydrology. Figure 17 shows the reasons for requesting assessments.

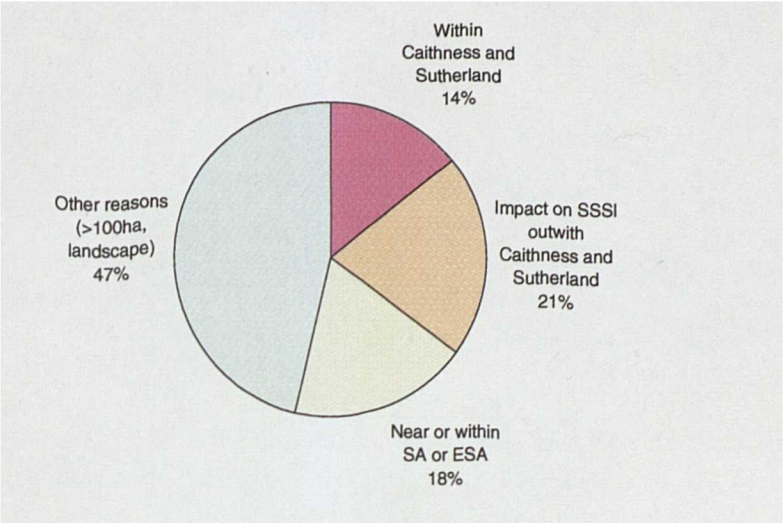


Figure 17. The Forestry Commission's reasons for calling for an environmental impact assessment (FC, 1998b).

The periods of time taken between the various stages of the assessment process, from the initial request for an assessment to be carried out to the final decision being made on the proposal were also detailed. Figure 18 illustrates the average number of weeks for a scheme to pass through each stage in the environmental impact assessment process by Conservancy, where Stage 1 is the period from when the environmental assessment is requested by the Forestry Commission to the time when the applicant accepts the requirement for environmental assessment. Stage 2 is the period from when the requirement for environmental assessment is accepted by applicant to the time the environmental statement is received by the Forestry Commission. Stage 3 is the period from when the environmental statement is received by the Forestry Commission to the time when the environmental statement is accepted by the Forestry Commission. Stage 4 is the period from when the environmental statement is accepted by the Forestry Commission to the time when a contract for the afforestation project is approved. From the data it can be seen that the average time for an afforestation proposal to pass through the environmental impact assessment process within the forest sector was 68 weeks. Jones, Wood and Dipper (1998) in a study of UK environmental statements noted an average time of 29 weeks, ranging from only three weeks to two years. While there was considerable difference between the conservancies on overall time taken the relative proportions of time between the four stages were remarkably constant. Further the two conservancies with the highest caseload

of environmental impact assessment have the longest average process period. The process times for Strathclyde and Highland have been somewhat distorted by three projects which have effectively stalled at Stage 4.

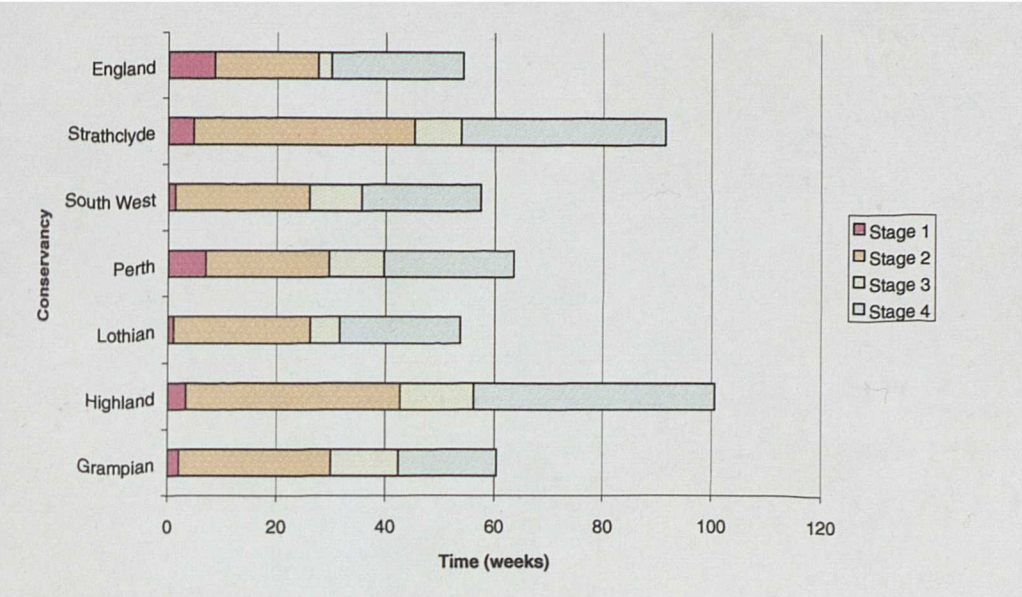


Figure 18. Process times for forest sector environmental impact assessments (FC, 1998b).

3.5.4 The Size of Proposals Subject to Environmental Impact Assessment

Of the 98 afforestation proposals that have completed the environmental impact assessment process between 1988 and 1998 in Scotland, it can be seen in Table 5, that only 11 schemes totalling 798.5 ha were under the 100 ha indicative threshold. This equates to 5% of the number of schemes and 1.5% of the area of schemes called for assessment. Comparing the profile of Woodland Grant Scheme proposals subject to environmental impact assessment with the profile of proposals not subject to environmental impact assessment shows that a total of 42,872 ha or 36% of the total area afforested during the period was subject to and completed the environmental impact assessment process. However the figures shown in Table 5 indicate an anomaly wherein a larger number of schemes and larger area were subject to assessment and completed the assessment process than were finally included in the Woodland Grant Scheme. This can be accounted for by the fact that a small number of schemes never gained an approved contract and therefore never entered the Woodland Grant Scheme. Additionally, by comparing the original planting proposals in the original WGS application and the planting proposals contained within the approved contract it can be seen that a large number of the proposals subjected to assessment were markedly reduced in extent prior to contract approval (Table 6).

Table 5 Comparison of Woodland Grant Scheme cases and projects which have completed the environmental impact assessment process (FC, 1998b).

Size Class (ha)	Woodland Grant Scheme cases		Environmental impact assessment schemes	
	Number	Area (ha)	Number	Area (ha)
0-49.99	6687	34635.69	2	73.2
50-99.99	249	17423.02	9	725.3
100-199.99	141	19459.46	22	3143
200-499.99	99	28768.08	33	11041
>500	24	17088.48	32	27889.5

Table 6. Comparison of the area discussed within the environmental statement and the final area stated within the Woodland Grant Scheme contract.

Size Class (ha)	Original ES data			Final WGS contract data		
	Number	Area (ha)	Average area (ha)	Number	Average area (ha)	Number of schemes within +/- 10%
0-49.99	2	73.2	37	2	168	1
50-99.99	9	725.3	81	8[1]	87	5
100-199.99	22	3143	143	22	116	11
200-499.99	33	11041	334	33	235	6
>500 ha	32	27889.5	871	29[2]	528	5

[1] One proposal contract never completed.
[2] One proposal rejected following assessment, three proposal contracts never completed.

The figures in Table 6 indicate that the majority of schemes were radically altered in extent prior to approval of the Woodland Grant Scheme contract. This is especially the case within those proposals greater that 100 ha where only 25% of contracts detailed areas that were within +/- 10% of the original area stated in the initial WGS application. However further investigation reveals that of the original 32 proposals greater that 500 ha in extent which completed the assessment process, only 14 resulted in an approved Woodland Grant Scheme contract greater than 500 ha. Within this size class while one project was eventually rejected following completion of the assessment process, three projects never received an approved contract. From the 29 remaining projects only 14 resulted in an approved Woodland Grant Scheme contract greater than 500 ha in extent. However only 11 of these totalling 8434.38 ha relate to individual Woodland Grant Scheme proposals with the remaining 3 relating to multiple or grouped applications were a number of afforestation projects are assessed through one environmental impact assessment. These multiple schemes therefore are not accounted for within the number of approved projects (individual) greater that 500 ha as detailed in Table 5. This means that there were a further 13 afforestation projects totalling 8654.1 ha for which an approved Woodland Grant Scheme contract was issued without being subject to the environmental impact assessment process. These approved projects were located throughout the six Scottish conservancies with 4 in Highland, 3 in Strathclyde, 2 in South West and Perth and one each in Lothian and Grampian.

However perhaps the most important issue to consider within the analysis of this data is the fact that in over 70% of all the cases which completed the environmental impact assessment process the area finally approved within the Woodland Grant Scheme contract was markedly different from that originally proposed in the initial Woodland Grant Scheme application form and detailed within the environmental statement. These amendments resulted in an average reduction in project area of 20 % for those cases between 100 ha – 199.99 ha, a 30% reduction for those cases between 200 ha – 499.99 ha and a 40% reduction for those cases identified as greater than 500 ha in extent in the original Woodland Grant Scheme application. Other researchers (Wood and Jones, 1992; Frost, 1994) have suggested that within other sectors up to 50% of projects have material changes to project design between production of the environmental statement and project approval. Within the forest sector the reasons for such large changes to project design as noted above are unknown however it would be reasonable to assume that the amendments were requested by the Forestry Commission due to the fact that the schemes did not meet the requirements of the Woodland Grant Scheme. If this also means that the projects were thought to include adverse significant impacts by the Forestry Commission then is contrary to the findings of the environmental statements as will be detailed in Chapter 4. Were this situation correct it would mean that the Forestry Commission was accepting environmental statements as suitable for inclusion in the decision making process but then dismissing the findings of the assessments. The efficacy of the Forestry Commission review process could in this situation be justifiably questioned.

Reviewed environmental statements contained a wide variation in length of environmental statement with the shortest 5 pages and the longest over 150 pages. While not an altogether complete method of reviewing the thoroughness of assessments, an environmental statement of only 5 pages, including cover-sheet, contents page and acknowledgements may be compromising clarity and quality of information for brevity. In line with Directive 85/337/EEC, the proponent is permitted to charge a fee for copies of the environmental statement. Generally this fee was set at £15-£25, however the highest charge was £40, which was set for one of the shortest environmental statements. The idea of charging a fee is not to allow the proponent to recoup some of the expenditure incurred while preparing the environmental statement but to cover additional printing and binding costs, and limit requests for copies to those seriously interested in the proposal.

3.6 Chapter Summary

Forest law within the United Kingdom is well established and the regulation of forest operations through the Woodland Grant Scheme and felling licences administered by the Forestry Commission. Despite a steady decline in the area afforested annually since 1988 the UK

Government has maintained a 33,000 ha annual target which has never been achieved. The UK Forestry Standard and the individual national forest policies set out the broad aims of the Government's forest policy and the Woodland Grant Scheme provides the basic mechanism through which forest management can be moved towards the targets within these policies. These national measures have recently been augmented through the advent of additional non-governmental and international standards such as the UK Woodland Assurance Scheme and the Forest Stewardship Council Principles and Criteria for Forest Management which advocate the sustainable management of forests but also have at their core the use of environmental impact assessment as basic tenet of forest management.

Over 22,000 afforestation projects have been initiated through the Woodland Grant Scheme in Great Britain during the period 1988 to 1998. This amounted to almost 160,000 ha of new forests. The distribution of afforestation projects was divided unevenly between England, Scotland and Wales. The number of afforestation proposals was divided 61%, 32% and 7% in England, Scotland and Wales respectively. The area of afforestation proposals was divided 24%, 73% and 3% in England, Scotland and Wales respectively. The average area of an afforestation scheme throughout Great Britain over the period 1988 to 1998 was approximately 7 ha, while nationally the average areas were 3 ha in England and Wales, and 16 ha in Scotland. Within the Scottish Conservancies there was also an uneven distribution of afforestation proposals with Highland Conservancy contributing almost one third of the area in Scotland and one quarter of the area afforested in Great Britain as a whole with an average scheme size of 30 ha. During the period 1988 to 1998, within Scotland the broadleaved component rose from 16% of the area afforested to 50%.

During the ten years since 1988 a total of 211 environmental impact assessments have been called, with 205 within Scottish Conservancies, 6 within English Conservancies and none in Wales. Of the 211 called a total of 101 have completed the assessment process. Only one proposal has been refused entry to the Woodland Grant Scheme following an environmental impact assessment. However approximately 25% of projects called for assessment have their applications to the Woodland Grant Scheme withdrawn from the process. Over 75% of all assessments were called within Highland, Strathclyde and Perth Conservancies with almost half of the total number arising in Highland Conservancy alone. The average time for a proposal to complete the assessment process was 68 weeks.

Analysis of proposals accepted into the Woodland Grant Scheme without assessment and those called for environmental impact assessment indicates that there was a marked difference in over 70% of cases in the areas initially identified in the environmental statement and those finally accepted in the Woodland Grant Scheme contract. For projects greater than 500 ha in the

original application there was an average 40% reduction in scheme area in the final Woodland Grant Scheme Contract.

CHAPTER 4 REVIEW OF SECTOR ENVIRONMENTAL STATEMENTS

4.1 Introduction

This chapter begins with an examination of the reasons for carrying out a structured review of environmental statements. Existing review methodologies are discussed and the structures within the Forestry Commission for environmental statement review are described. A review methodology for use within the forest sector which was created for this research by adapting the widely accepted Environmental Statement Review Package is described. The adapted review methodology has a hierarchical structure with 4 review areas, 13 review categories and 83 review sub-categories. Results from the sub-categories are aggregated up through the hierarchy to give an overall environmental statement review grade. The adapted review methodology is then applied to 73 environmental statements from the forest sector and the results combined with those of 16 environmental statements reviewed with the same methodology in 1996. The chapter concludes with an examination of the individuals and organisations involved in the preparation of environmental statements in the forest sector.

4.2 Reviewing Environmental Statements

4.2.1 The Reasons for Reviewing

The environmental statement was discussed in Section 2.8. As defined by Ross (1987), one role of the environmental statement is to describe the project, location and other factors that make up the environment in the wider sense. The environmental statement should also provide a detailed description of the potential effect of the proposal on the area's environment and identify the measures the proponent intends to take to reduce these impacts. Ross (1987) also asked three pertinent questions of the environmental statement in terms of its value to the decision making process:

- Is it focused on the key questions that need to be answered to make a decision about the proposed action?
- Is it scientifically and technically sound?
- Is it clearly and coherently organised and presented so that it can be understood?

These three simple questions could be considered to constitute what is commonly known as the review process - the idea that on completion, an environmental statement is thoroughly vetted to ensure that it adequately covers the proposal in question, is focused on the pertinent points and uses credible sources of information as the basis of analysis before it is accepted as an impartial and accurate submission to the decision making process. In effect, this stage ensures that

decision-makers are provided with adequate and truthful information on which the decision about a project's future can safely be based. There is little benefit in implementing a comprehensive system of environmental assessment if no check is made on the validity and impartiality of the data presented to the decision-makers. The best or most powerful legislative system will provide little in terms of environmental protection if the information on which decisions are based is partial, flawed or biased. Lee (2000) notes growing consensus among environmental impact assessment practitioners about what constitutes a good environmental impact assessment based on good assessment practice. However when discussing environmental statement review it is useful to bear in mind that the real goal is performance of the assessment process as a whole rather than just the quality of the environmental statement (Lee, Walsh and Reeder, 1994).

Tomlinson (1989), the EC (1996a) and the CEAA, (1997) suggest that an established review procedure gives additional benefit other than as a post-assessment check. If review procedures are considered by environmental statement authors during the assessment then environmental statements should contain the necessary information to fulfil the demands of the environmental statement reviewer. In addition as a result of this acknowledgement environmental statements should become more penetrating documents of analysis rather than the current descriptive tomes. Environmental impact assessments and the resultant environmental statements should move away from fulfilling legal requirements to fulfilling the knowledge or information requirements of decision makers. Lee and Colley (1992) suggest that environmental statement review can be beneficial if carried out at different times within the assessment process and by different actors. The proponent or environmental statement author can use the review to identify deficiencies in the assessment while the statement is in draft form prior to submission. This should ensure that the environmental statement can be accepted without delay caused by re-drafting, which would be of benefit to proponents. The use of reviews by consultees is also advocated as a means through which consultees can prepare comments on received environmental statements. A systematic mechanism for handling environmental statements would ensure all statements were treated with the same vigour. The most common perception of the use of environmental statement review would be by competent authorities. Review can be the basis for identifying additional information requirements in the assessment and highlight deficiencies in baseline data, predictions, the assessment of impacts and methods of mitigation and monitoring which would require revision by the environmental impact assessment team or the environmental statement author. Similarly the review can highlight deficiencies in the competent authority's knowledge and identify where further information should be sought from consultees, research or third parties. The value of review in all three stages can be seen through examination of why environmental impact assessments are thought to be inadequate. Eccleston

(1999) notes that the principal reasons for finding environmental statements inadequate within the NEPA context found by the courts in the process of legal challenge were:

- Trivial treatment of indirect or cumulative impacts;
- Sweeping conclusions unsupported by fact;
- Vagueness in respect to important issues;
- Failure to include sufficient information on impacts associated with reasonable alternatives;
- Failure to make unbiased comparisons with alternatives;
- Failure to adequately investigate mitigation measures.

Eccleston (1999) follows on to note that through its review process the Environmental Protection Agency found similar inadequacies within environmental statements in the USA. Tzoumis and Finegold (2000) in a study of over 19,000 draft environmental statements in the USA suggest the quality of information is going down.

4.2.2 The Formal Review Process

In some countries the process of ensuring the quality of environmental statements has been formalised. Canada and the Netherlands have formed environmental impact assessment commissions which review the quality of submitted environmental statements prior to their acceptance into the decision making process. For example, in 1973 the Canadian Cabinet set up the Federal Environmental Assessment Review Organisation (FEARO) as an agency independent from the Department of the Environment to assess the quality of environmental statements through the Environmental Assessment and Review Process (EARP) (Elkin & Smith, 1988). In this process federal agencies perform self-screening of project proposals and produce an environmental statement for those projects thought to require further assessment following scoping guidelines from FEARO, who subsequently review the environmental statement for quality. In the UK there is no such legal requirement for an independent, or otherwise, review in environmental statements. On receipt of an environmental statement, the competent authority can have a difficult choice to make. Without a documented and systematic approach the identification of failings of the environmental statement becomes difficult as the range and depth of potential issues is difficult to manage in an *ad hoc* manner. If the competent authority does not believe the environmental statement to be sufficiently comprehensive or of adequate quality it can either request further information from the applicant or refuse permission for the project and risk an appeal for Ministerial direction. An application cannot be deemed invalid solely for the reason that the supporting environmental statement is of poor quality. However with the 1998 legislation the Forestry Commission derived the ability to dismiss applications to the Woodland Grant Scheme if the proposal itself was fundamentally flawed. Glasson *et al.* (1999) suggest that many competent authorities, especially those

receiving few environmental statements do not possess the range of expertise to assess adequately the quality of an environmental statement, and hence the quality of information finally presented to decision makers may be questionable. This may be especially the case when the environmental statement has been prepared by an organisation which itself has limited environmental impact assessment experience. The Forestry Commission has, as a whole, administered a large number of environmental impact assessments, however this is spread over 15 conservancies, the majority of which have had little exposure to the environmental impact assessment process. The Forestry Commission could therefore be thought of at a national level knowledgeable, but in certain individual conservancies, lacking in experience.

Within the forest sector in Great Britain, no review of environmental statements has been carried out until relatively recently. Up until 1997 the Forestry Commission did not subject environmental statements to any formal review process at which point the author of this PhD began to provide independent review on contract to the Forestry Commission. Information regarding environmental assessment is contained within the Forestry Commission Woodland Grant Scheme Grants & Licence Division Code. Very little guidance for Forestry Commission staff is given in this, referring to the Environmental Assessment of New Woodlands (1993) booklet. It is therefore left to the discretion of the Forestry Commission staff dealing with the proposal whether or not the environmental statement is acceptable and can be used in the decision making process. Attention is directed to the information provided by organizations contacted by the Forestry Commission and informed of the requirement of an environmental statement suggesting that any points raised by these should be adequately covered. The code follows on to note that further information may be sought should the environmental statement be deemed to not fully address the main effects of the proposal. However no detail or guidance is given as to how this can be carried out. Finally the code provides for a copy of each environmental statement accepted by the Forestry Commission to be sent to a central repository at Private Woodlands Branch Head Quarters. However, the collection of environmental statements at the Forestry Commission's Head Quarters is far from complete and all environmental statements reviewed during the course of this research were sourced from the conservancy offices.

The Forestry Commission has commenced the drafting of a forestry practice guide on the preparation of environmental statements (Forestry Commission, 1995). In the absence of an existing formal review checklist this could provide guidance for Forestry Commission staff undertaking a review of an environmental statement. However this has as yet, to be made available to all levels of the Forestry Commission or the general public. The author of this study was commissioned to redraft this guidance in 1998 however release has been delayed due

to legislative changes brought about through devolution. This draft document sets out the reasons why assessment may be required for some afforestation projects, and lists the benefits that may result from carrying out an environmental impact assessment. The guide does not give a list of specific tasks or items which should be addressed in an environmental statement, commenting that given the wide range of possible afforestation proposals this would be impractical. The guide does stress the selectivity of environmental impact assessment, in particular that the assessment should concentrate on significant effects relevant to the proposal and how they will affect the environment, and present the information in a balanced, objective way. In addition the guide suggests a concise environmental statement with adequate use of maps and diagrams, including summaries of long or complex sections. The importance of valid technical information to support assertions is stressed. The guide also gives an outline of the general content of an environmental statement.

From anecdotal evidence, it is believed that the list of information specified in SI 1988 No 1207 (Appendix 1.1), formed the basis of the initial internal Forestry Commission review process (Forestry Commission personnel, *personal communication*). On receipt of an environmental statement the local forest officer together with the Conservator would have to decide on the acceptability of the statement, using their local knowledge of the proposed area to consider the possible implications of the project and compare their own findings with those covered in the environmental statement presented. While it is very necessary to have this expert local knowledge to identify areas of potential impact, there is also a need to ensure that all environmental statements are scrutinized with similar vigour, and the benefit of experience is shared quickly throughout the country.

There is widespread acknowledgement that post-development auditing has the potential to provide feedback which would allow improvement in the assessment process (Wood, 1999). There have been a number of post-development audit studies of environmental impact assessment carried out in the UK and internationally Bissett (1984), Bissett and Tomlinson (1988), Sadler (1988), Bird and Therivel (1996) and Guilianpour and Sheate (1997) and of higher level plans Simpson (2001) although not focusing on forestry sectors. These take the form of a comparative audit of the predictions and actual outcomes of baseline levels, predictions of impacts and mitigation method efficacy following project implication. The studies share the common conclusion that in most cases impact predictions are recorded so imprecisely that it is subsequently impossible to enable the accuracy to be tested. However where predictions were made clearly and it was possible to test these sufficiently they were found to be reasonably accurate. The studies also found discrepancies between project specification in the environmental statement and the actual specification used. This obviously

has consequences for impact identification and prediction where different techniques and materials are used. Dipper, Jones and Wood (1998) in a review of post-audit studies highlight the lack of or inadequacy of monitoring data, ambiguous wording of predictions, the lack of post-auditing methodologies and post assessment project design changes as barriers to completing post-auditing. The results of eight post-audit studies in the UK show that from 366 predictions 57% were auditable, with the landscape and visual category obtaining the highest level of auditability at 84%. Of the auditable predictions, 73% were found to be accurate (Dipper et al., 1998). Within a later study by Wood, Dipper and Jones (2000) of 865 predictions from 28 UK projects 56% were found to be auditable of which 79% were deemed accurate or nearly accurate and 21% inaccurate. The most commonly auditable qualitative predictions were related to landscape, flora and fauna. The most commonly auditable quantitative predictions were related to noise, air quality and traffic. Wood *et al.* (2000) give the reasons for the low auditability as:

- Lack of data
- Ambiguous or vague predictions
- Time dependency (project not yet at the stage to allow audit)
- Unpredicted impacts

In a post-audit study of visual impacts Wood (2000b) noted a wide range in the accuracy in predictions contained in the environmental statements when compared to actual impacts.

4.3 Existing Review Methodologies

There are no formal arrangements as yet in the UK under any legislation for the review of environmental statements. Internationally, a number of attempts have been made to devise review systems for environmental statements. Elkin and Smith (1988) suggest that an effective review procedure ensures that the environmental impact assessment disclosed all the relevant information and the decision-makers are advised if the predicted benefits exceed the costs of the project. They follow on to state that a good review procedure should allow the reviewer to -

- Ascertain the completeness of the environmental assessment;
- Assess the accuracy and validity of the information presented;
- Rapidly become familiar with the project and location, and be in a position to determine whether any part of the assessment requires further input;
- Assess the significance of the effects of the proposal.

Elkin and Smith (1988) developed a system for reviewing reports from Canada's National Parks with a view to improving the procedures for handling these documents. They borrowed from earlier work in Canada and suggested an adequate environmental statement would focus on nine

areas. The results of their review of 14 environmental statements revealed that half were inadequate. Tomlinson (1989) building on this work also proposed nine main issues (Table 7).

Table 7. Elkin and Smith, and Tomlinson's issues for review.

Elkin and Smith (1988)	Tomlinson (1989)
Meeting administrative requirements	Administration
Effective Communication	Effective communication
Identification of key concerns	Impact identification
Looking at alternatives	Alternatives
Collecting information	Information assembly
Describing baseline conditions	Baseline description
Predicting impacts	Impact prediction
Managing and mitigating impacts	Mitigation measures
Follow up: surveillance and monitoring	Monitoring and auditing

Lee and Colley (1992) proposed a review process, The Environmental Statement Review Package (ESRP), which has subsequently been used directly or in a number of modified forms to review environmental statements from a number of sectors in the UK and internationally. In the ESRP, two reviewers apply a set of review criteria, initially independently and subsequently jointly, to the environmental statement under review. The set of review criteria covers all tasks involved in the preparation of an environmental statement - based on EC and UK requirements and aspects of good international environmental impact assessment practice. The criteria are arranged in a hierarchical structure, commencing at Level 1 with simple criteria relating to specific tasks and procedures moving up to Level 4 with more complex criteria for overall assessment of the environmental statement. The review criteria are split into four review areas:

1. Description of the development, the local environment and baseline conditions;
2. Identification of key impacts;
3. Alternatives and mitigation;
4. Communication of results.

Within each of the review areas there are review categories and review sub-categories. The reviewer is asked to grade the environmental statement against each of the sub-categories in turn. Through simple averaging of the sub-category grades (modified where necessary using other information gained from the environmental statement) an aggregate grade is derived for each of the review categories. These grades are then averaged to give a grading for each of the four review areas which are used to give the overall grading for the environmental statement. A grading system was then used to rank each criteria from A = excellent, no tasks incomplete to F = very poor, important tasks poorly done. The major flaw with such averaging of grades is that no weighting is given to the relative importance of the criteria. In a review category with few sub-categories the process of averaging can have greater influence on overall outcome than in one which has many sub-categories. Within the four levels are 50 review criteria against which

the environmental statement is graded. The criteria were designed to be unambiguous and clearly defined. Each criterion has a distinct purpose. Each criterion covers an issue which is considered to be sufficiently important to influence the overall quality of the assessment.

Lee and Colley (1992) reviewed 12 environmental statements and noted that only three assessments could be considered of sufficient standard to merit an A or B grading. They cite common deficiencies in environmental statements:

- Inadequate treatment of waste types and quantities;
- Inadequate identification of key issues and scoping of potential impacts;
- Inadequate assessment of impact significance;
- Poor treatment of alternatives;
- Bias and inappropriate emphasis.

Lee and Colley (1992) concluded by suggesting that the deficiencies in the sample of environmental statements reviewed were the result of the failure of environmental statement authors to understand adequately the concept of environmental impact assessment and the requirements of environmental statements. The environmental statement was therefore written as a document providing supporting evidence in favour of the project, despite the Government's guidance that this is not appropriate within environmental impact assessment.

The European Commission's (1996c) study of assessments within eight member states that 70% of environmental statements were satisfactory, obtaining a C grade or higher. This result indicated an improvement on the results of similar studies in the early 1990s and late 1980s. The study identified the least satisfactorily completed elements of assessments as the identification and evaluation of key impacts and the coverage of alternatives and methods of mitigation. Ibrahim's (1992) study of 13 environmental impact assessments prepared in Malaysia between 1988 and 1991 determined that only 8% were of good quality (A or B grade), 77% were borderline (C or D grade) and 15% were of poor quality (E or F grade). Review area 4 was graded highest followed by areas 1, 2 and 3. Rout's (1994) study of 7 environmental impact assessments prepared in India determined that 30% obtained an overall C grade and 70% obtained an overall D, E or F grade. Within Rout's study review area 1 was graded highest followed by areas 4, 3 and 2. Mwalyosi and Hughes' (1998) study of 26 environmental impact assessments prepared in Tanzania determined that within review area 1 73% of assessments obtained grade A or B; within review area 2, 42% of assessments obtained grade A or B and within review area 3 31% of assessments obtained grade A or B. Commenting on the above three studies Lee (2000) identifies common areas of poor performance:

- Estimation of residual impacts

- Scoping
- Assessment of impact magnitude and significance
- Commitment to mitigation
- Bias
- The non-technical summary
- Consideration of alternatives.

Glasson (1999) provides an interesting comparison of the quality of environmental statements prepared before and after 1991 and notes a general improvement across all review categories. However this improvement should be tempered by the fact that the overall review grades are still for post-1991 environmental statements either poor or very poor. Lowden (2000) utilises the review methodology proposed by Gray (1996) to evaluate the coverage of ecological issues within forest sector environmental statement. The results indicate that while ecological considerations are increasingly dealt with in more detail overall coverage is still poor.

4.4 The Review Procedure Used in this Research

4.4.1 Adaptation of the Methodology

To review a sample of forest sector environmental statements it was decided to use a method adapted from the existing successful review methodologies used by Elkin and Smith (1988), Tomlinson (1989), Lee & Colley (1992), Colley and Raymond (1994) and Hickie and Wade (1998), which incorporated the good points of these, modified to address the particular characteristics of afforestation projects. Utilising these methods would allow comparison with reviews of environmental statements carried out in other sectors such as Dancey and Lee (1993), McGrath and Bond (1997), Weston *et al.* (1997), Bojorquez, Tapia and Garcia (1998), Barker and Wood (1999) and Lee, Colley, Bond and Simpson (1999). While the ESRP method can be seen as being subjective (Slater, 1995), it has been utilised successfully in a large number of UK studies of environmental statement quality and there is increasing convergence of opinion among environmental impact assessment practitioners that the method constitutes best practice and worthy of use. This is due to the fact that iterative review of environmental statements using the ESRP results in substantial agreement in the findings of different reviewers.

4.4.2 The Methodology Used to Review Forest Sector Environmental Statements

The methodology was split into sections which concentrate on tasks which were thought necessary in a forest sector environmental statement. Some of these tasks were legally required, others were aspects which were felt should be present in a competent assessment. The reviewer was prompted to record whether or not a specific item or task was covered, and if present, grade the quality of the information. Grading follows a simple four point scale of A to D, with two

additional categories N, where no attempt has been made to furnish information on the task or item, N/A - where the environmental statement has assessed the requirement of the specific item or task and concluded that in the context of the particular proposal this information is not applicable (Table 8). This grading system differs from that utilised by Lee and Colley (1992) following comments by the Forestry Commission in the initial phase of this work requesting that the grading system should make it perfectly clear whether or not the categories in the environmental statement were acceptable or otherwise. In particular the Forestry Commission requested that there should be no 'borderline' grading. Therefore excluding the N/A category used in both Lee and Colley's (1992) work and this research work, the six level Lee and Colley (1992) rating was reduced to four levels where information was presented and a separate grading for omitted information (Table 8). To provide a useful addition to the decision-making process the omission of information due to its non-applicability should be made explicit. The practice of not referring to an item or task may leave the environmental statement open to question about its satiety. The use of letters rather than numbers follows Lee and Colley's (1992) grading system.

Table 8. The quality grading system used within the research.

Grade	Quality Grading
A	Excellent, item fully covered, task fully completed, all relevant information quantified.
B	Good, minor omissions, most information quantified.
C	Poor, major omissions, limited coverage, relies mainly on qualitative information.
D	Very poor, very limited coverage, quantitative information completely absent.
N	Not covered in assessment.
N A	Assessed as not applicable in environmental statement.

The review methodology identifies the following review areas and categories as necessary in a complete environmental statement, within which lie 81 review sub-categories (Appendix 2.2):

1. Description of the project and local environment:
    - 1.1 Development description;
    - 1.2 Site description;
2. Identification and evaluation of key impacts:
    - 2.1 Scoping;
    - 2.2 Baseline conditions;
    - 2.3 Prediction of impact magnitude;
    - 2.4 Assessment of impact significance;
3. Alternatives and mitigation:
    - 3.1 Alternatives;
    - 3.2 Mitigation;

3.3 Monitoring;

4. Communication of results:

4.1 Presentation;

4.2 Balance;

4.3 Non-technical summary;

4.4 Difficulties in environmental statement production.

The methodology does not describe specific baseline conditions or impacts that should be included in an environmental statement. It is felt that this could lead to a restricted assessment by the reviewer. What is described are the items thought pertinent against which each impact or baseline condition should be evaluated. The reviewer should in each case assess these two sections and decide whether or not the important impacts and baselines have been identified - this would be assisted by a full scoping exercise.

4.4.3 The Sample of Environmental Statements

The Forestry Commission agreed to make available for review as many of the environmental statements submitted since 1988 as was possible. Initially it was planned to complete a 100% review of all environmental statements submitted to the Forestry Commission which had subsequently completed the application process to the Woodland Grant Scheme. In addition to the environmental statements the Forestry Commission agreed to provide as many of the accompanying Woodland Grant Scheme case files as possible. It transpired that a number of these files were currently in use by the Forestry Commission for administrative reasons and would therefore be unavailable for this study. Notwithstanding this difficulty a total of 73 environmental statements were obtained and reviewed, approximately 40% of which were accompanied by their Woodland Grant Scheme case file. The results of these were added to the 16 environmental statements reviewed previously by Gray (1996) giving a total of 89 environmental statements reviewed which is an 88% sample. A list of all the environmental statements included in the review is appended (Appendix 2.4). This accounted for approximately 100 Woodland Grant Scheme proposals as a number of the environmental statements were prepared for grouped proposals submitted individually by a proponent but ostensibly constituting one development.

4.4.4 Maintaining Review Quality

Within the Lee and Colley (1992) method to overcome the problems of subjectivity and promote objectivity within the review, it is recommended that two individual reviews are carried out independently by separate reviewers. Significant differences in the separate reviews could then be analysed before a compound or joint final review is presented. The importance of this stage is acknowledged in ensuring objective, consistent review. However in this study it

was not possible to have two independent reviewers and the researcher alone carried out all reviewing. Two methods were to overcome this weakness in the methodology.

Firstly a randomly chosen selection of environmental statements were reviewed for a second time by the researcher. The environmental statements and files were obtained from the Forestry Commission in batches of approximately 15. On completing a batch, before returning them to the Forestry Commission, a sample of 20% was randomly selected and re-reviewed by the researcher. The results of the original and second review were then compared and differences in the outcomes checked through re-visiting the environmental statement and using the review notes to establish the reason for the discrepancy in grading. From this a final unified review was prepared and used in the study. In total 15 environmental statements were subjected to this check. While differences were found between the two reviews at the sub-category level, no differences were greater than one grade, and no differences were found between grades given to review categories, review areas or the overall environmental statement grades.

The second method used was the independent second review of a sample of environmental statements by two researchers at the University of Manchester EIA Centre. This independent review was carried out after the initial review of the 89 environmental statements had been completed in order to identify potential sources of bias or partiality. For this independent review a stratified sample of environmental statements was selected to give a range of conservancy, geographical locations, project type, size, author and year of publication. A total of 7 environmental statements, an 8% sample, were selected. These 7 environmental statements were then re-reviewed and the results compared with those from the original review. The results (Appendix 2.5) show that while there is obviously scope for differences of opinion between the reviewers within the individual sub-category level the grades awarded are comparable between the initial and second review. At the sub-category level, in only 9 instances the scores of the two reviewers differed by greater than one grade. One environmental statement (Auchleeks) included four instances, two (Arisaig and Glenkinglass) included two instances and one further statement (Glen Uig) included one instance. Five instances occurred within the category dealing with the prediction of impact magnitude and 4 of these differences are found in one environmental statement (Auchleeks). In three of the environmental statements (Inverchoalin, Strath Tirry and Stockwell Farm) differences between the reviewers' grades were restricted to one grade difference. At the category level, in 4 instances the scores of the two reviewers differed by greater than one grade. No differences were greater than two grade points. At overall environmental statement level, in only one case (Strath Tirry) did the grades of the two reviews fail to agree.

At the sub-category level, there were 75 instances where the 1st and 2nd reviewers did not agree

on the adequacy of the environmental statement, where A or B grades are considered adequate and C, D or N grades are inadequate. All 7 of the environmental statements included differences such as these. The smallest number of instances occurred in the Inverchoalin environmental statement (4) and the largest number occurred in the Strath Tirry environmental statement (22). 44 sub-categories contain these adequacy differences between the 1st and 2nd review results. At the review category level there are 12 instances where the 1st and 2nd reviewers failed to agree on the adequacy of the environmental statement. Of the 12 instances 4 are attributed to one review category, regarding site description, and one environmental statement, Strath Tirry, accounts for 6 instances. Examination of the 1st and 2nd review results (Appendix 2.5) indicates that there are differences between the reviewers at all levels of the review hierarchy. However the results also show there is general agreement between the reviewers on the quality of the environmental statements in the sample.

It is acknowledged that this methodology differs from the model in the Lee and Colley review package (Lee and Colley, 1992), in that the second review is a sample and does not give full coverage, and was carried out after the completion of the initial review. However it is considered that this process provides for and demonstrates achievement of objective and consistent review within this research work.

4.5 Results From the Review of Forest Sector Environmental Statements

The results of each environmental statement review were recorded on a separate review sheet. A review matrix record sheet is appended (Appendix 2.3). Each environmental statement was examined in relation to its contents against the key elements identified in the review method. In particular the review examined the environmental statements for quantified data wherever possible with supporting references, in essence appraising whether the information presented could be reliably introduced to, and assist in the decision making process. The following sections discuss the analysis and results of the review and extracts examples of good and poor inclusions in the environmental statements. The results identify a wide variation in the contents of environmental statements, which is to be expected as each environmental statement should be tailored to address the particular aspects of concern of the proposal in question. The results also identify a wide variation in the quality of information between the environmental statements. The results for all the environmental statements included in the review are appended (Appendix 2.4).

4.5.1 Description of the Project and Local Environment

4.5.1.1 Development Description

Review Sub-category Elements

The first section of the review examines to what extent the afforestation project has been described with regard to its size, the woodland design and work methods employed. The reviewer should, from this section be able to understand quickly the aims of the proposal and the methods of working that are prescribed to reach these objectives. This should include a full description, which can be augmented through the provision of maps, of the extent and make-up of the project, with estimates of inputs and projected quantities of any possible emissions and residues. Current best practice would include estimates of projected chemical use, fertiliser requirements and estimates of silt loading and run-off of nutrients, pesticides and fertilisers. A comprehensive development description would also include details of present and proposed future access routes and any different phases of development through which the project may pass, for example establishment, thinning, clearfelling, restocking. Therefore discussion of potential yields which may be harvested may be useful if potential impacts on infrastructure are considered. In certain cases, for example where natural regeneration is employed the establishment phase may be categorised by slow progression and may be relatively benign. This could be contrasted by a clearfelling operation in a later phase, which has immediate effect and may be much more environmentally intrusive. It is therefore vital that operations planned for a later phase in the project's life cycle are not ignored simply because they are programmed for a future date beyond the five year Woodland Grant Scheme. The objective of environmental impact assessment is to identify and deal with potential impacts at an early a stage as possible.

If the assessment of impacts is limited to those arising during the establishment phase a project could be approved while having future adverse impacts, were these outweighed in the decision making process by the potential benefits attained through timber production or employment in a later phase. If this project was subsequently subject to a pre-harvesting environmental impact assessment would the balance of benefits and disbenefits remain the same? If the answer to this is "no" it leads to two highly undesirable scenarios: to allow the harvesting to proceed and accept the impact as the project is already so far down the line; or, halt the project thereby stopping the flow of benefits and disbenefits. Adverse impacts in the early stages would then be endured but without the countering reward of benefits derived from harvesting.

It should be remembered that the environmental impact assessment should not be a supporting or corroborative document for the standard of the Woodland Grant Scheme. It should not be prepared as an effort to prove that the silvicultural prescriptions are sound. The environmental impact assessment is prepared to assess the impact of the project on the environment. Information must be of adequate standard but strictly limited to this task. The information supplied for the environmental impact assessment must therefore be of a higher level than that which would be presented for a 'regular' Woodland Grant Scheme application. Figure 19

illustrates the adequacy of the development description for the sampled environmental statements.

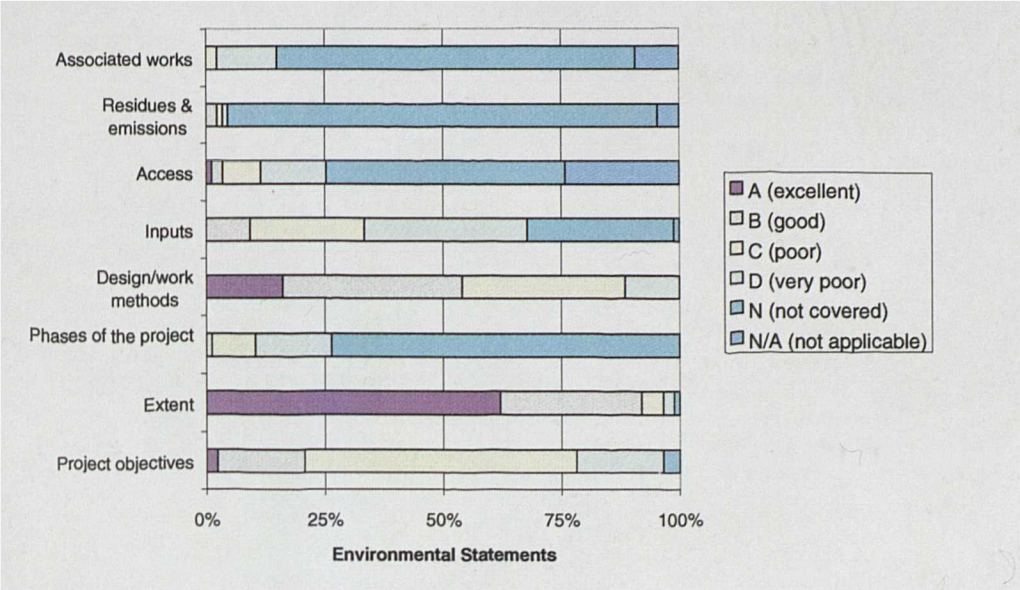


Figure 19. Review results: description of the development.

Review Sub-category Findings

It can be seen that only 20% of environmental statements contained adequate descriptions of proposal objectives, while three environmental statements did not include any mention of objectives. Many environmental statements simply referred to a copy of the appended Woodland Grant Scheme, or reproduced the objectives page from the Woodland Grant Scheme application form. This was considered to be insufficient, as the proposal had been identified as requiring a level of scrutiny over and above that which is carried out for a regular Woodland Grant Scheme. The information presented in the environmental statement should therefore be in greater detail. The essence of environmental impact assessment is to allow the decision-maker to make a decision with as wide an understanding of the costs and benefits associated with the project as possible. For example the decision-maker may be willing to accept the associated adverse impacts of a project if the economic or employment benefit related to high quality, high volume production was of sufficient extent. However to be able to make this decision the decision-maker must be given quantified details of the project's objectives, for example through estimates of the number of people expected to visit the site or production forecasts. In most cases details of project of objectives were limited in extent and gave no real account of what was sought or expected as an end result, or how the proposal fits into any higher level strategic plan of the estate, landholding or in a wider context the local authority's indicative forest strategy if available. The environmental statements for Wandel Hill,

Kinlochteacuis and Glen Uig illustrate typical entries for objectives.

> *"The objectives of the scheme are to remove a significant area of Wandell Farm from agriculture and produce a commercially sound forest investment based on timber production"* (Scottish Woodlands, 1993a).

> *"The objectives of the scheme are to diversify from extensive hill farming to a more mixed estate economy providing: income in the longer term from a commercial timber crop, restoration and expansion of semi-natural woodland"* (Scottish Woodlands, 1994).

> *"The objectives of the afforestation proposals are as follows:*
>
> - *to expand the area of woodland cover*
> - *to provide an improved wildlife habitat*
> - *to increase productivity of the land*
> - *to provide employment*
> - *to provide an alternative to agricultural production*
> - *to produce marketable timber*
> - *to establish a sustainable woodland"* (Tilhill Economic Forestry, 1996a).

Obviously these present very little useful information on exactly what the final outcome of the project is expected to be. Within the Glen Uig environmental statement for example, what wildlife habitat is expected to be improved? What is its present status, is it rare or is it common locally, nationally or internationally? What is meant by the term *improved,* is this to be measured as size, species richness or species numbers? The weakness of project objectives makes it difficult to identify what the potential outcome of the projects are and therefore allow adequate consideration of costs and benefits.

Over 90% of environmental statements included adequate details of project extent, and design or work methods had been adequately covered in the majority of sampled environmental statements. Most of the environmental statements included a redraft of the works details presented in the Woodland Grant Scheme application and which gave a full description of planned activity over the first 5-year period. Commonly while details of the initial 5-year period were provided there was very little provision of project details and therefore potential impacts in the longer term. However, a common failure was the non-specific reference to guidelines such as Water or Landscape rather than detailing specific work methods. In many cases such as the Traboyack Farm environmental statement, this failure was further

compounded by merely commenting that since the current guidelines would be adhered to, no further investigation would be required implying that any works carried out would therefore be environmentally benign. Current best practice, including that required by the UK Woodland Assurance Scheme (UKWASSG, 2000), would require site and situation specific consideration of potential effects. While this is obviously beyond the limits of best practice in the late 1980s it is disconcerting that environmental impact assessments prepared in the mid to late 1990s have not improved and still do not include such information.

> *"A cultivation plan will be prepared and agreed with the Forestry Authority prior to works commencing. Ploughing and drainage techniques will adhere to the current guidelines (3rd Edition Forest and Water Guidelines, RIN 196 Forest Drainage by DG Pyatt). Weeding by herbicide if required, will adhere to FC Field Book 8 'The Use of Herbicides in the Forest', and to manufacturers recommendations".* (Scottish Woodlands, 1995a).

Again, as these projects have been identified as requiring a higher level of scrutiny than that required for a 'normal' Woodland Grant Scheme proposal, generalities such as these are wholly inappropriate in environmental impact assessments. For example, in cases where hydrology is potentially adversely impacted, generalities such as those above are inadequate, and in order to make an informed decision full details of operational techniques, locations and timings are required. While 68% of environmental statements included information on inputs such as fertilisers, pesticides and planting stock, in only fewer than 10% was this assessed as being of an acceptable standard. Most failed to give adequate specific detail on application rates, methods or timing, such as the Strathconnon environmental statement. Others failed to provide a description of the alternative non-chemical methods available or an appraisal of the relative efficacy of individual chemicals versus their potential environmental risk.

> *"Aftercare will involve the minimum use of herbicides such as Glyphosate and Propyzamide which have low environmental impact"* (Scottish Woodlands, 1993b).

However, only 26% made any reference to future phases (such as thinning or clearfelling) of the project. Similarly, over 90% of environmental statements failed to mention the possibility of any residues or emissions from the proposal. Only 25% of environmental statements prescribed construction of car parks, footpaths and bridges and only 3% of these gave details of how or exactly where, these would be constructed. A further 24% stated that it was not applicable to discuss access as there was no or minimal public access to the project area despite footpaths being marked on accompanying maps.

4.5.1.2 Site Description

Review Sub-category Elements

The second section within the review examines the description of the proposed afforestation site. The reviewer should be able to quickly gather information on the location of the site, the present land use of the site and neighbouring land. In addition the reviewer should be made aware of any special designations on the site or immediate surroundings which could be affected by the proposal. In essence this is the opportunity for the environmental statement author to present background information, or existing general knowledge of the site in question. The environmental statement should attempt to provide information that is known about the project site already. However the distinction between information presented here and information presented as baseline data as the basis for appraising impacts must be understood. The information pertaining to this section can be thought of as scene setting. For example identification of the fact that within a 5km radius 60% of the area is already afforested, and that the majority of this has happened within the past 10 years. Another example could be the fact that the site is designated as a SSSI due to it being one of only a very few sites which contain a certain species of plant. Hence the reader can quickly see if a site has special features or conditions which should be taken into consideration later on in the assessment. This should be compared with information presented as baseline data. Rather than general descriptive information, baseline data must by its very purpose, be highly specific. It is presented to enable the effect of the project on a specific environmental element to be assessed. Information on site location should therefore try to place the project site in national and local contexts. Useful information would include land use classification for both the site and the neighbouring area, present land use and changes in land use over time. Of prime importance is the identification and description of designatory status of both the site and the surrounding area. Full details should be provided of the reasons for designation and any information provided on the fragility of the site, for example potentially damaging operations for SSSIs. It is essential that details are given for designated areas which although not located within the project site are located nearby, as the potential for remote or secondary impacts should not be overlooked.

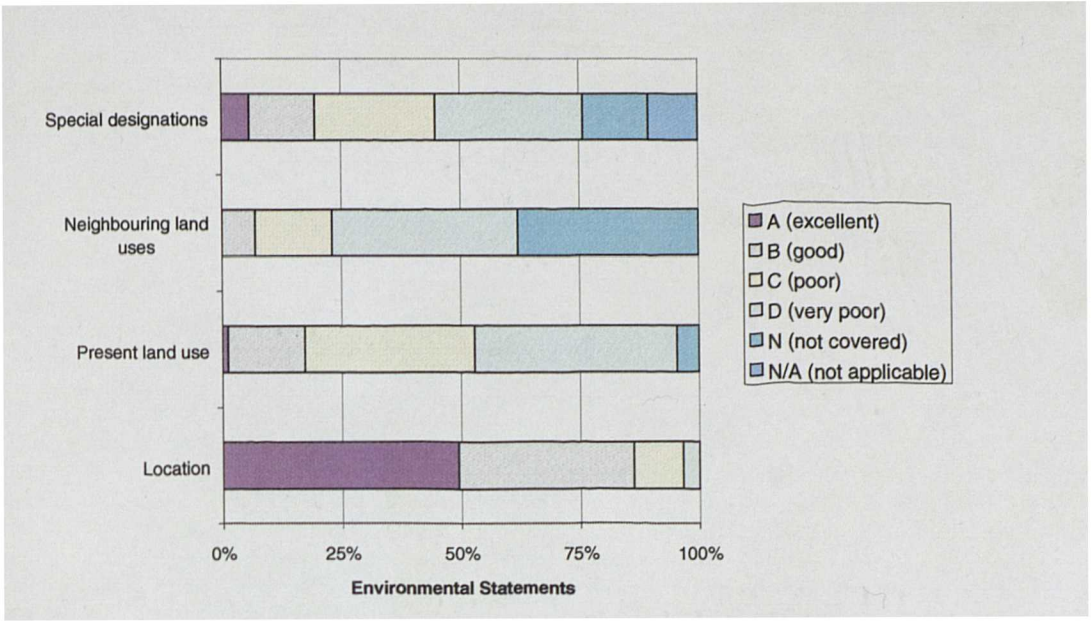


Figure 20. Review results: description of the site.

Review Sub-category Findings

Figure 20 illustrates the adequacy of the description of the site for the sampled environmental statements. Over 85% of environmental statements contained a comprehensive, detailed description of the project location, including large and small scale maps. Submissions were found to be below an acceptable standard due to instances of poor choice of scale. Examples included limiting the map area to the perimeter of the proposal or locating the area on a 1:2000000 scale map which equally gives no impression of the surrounding area. Maps were also presented without grid references or scale which meant it was difficult for the reader to locate the exact proposal area on other maps. While the majority of maps presented were of high quality and many were colour reproductions, poor quality photocopies were commonly encountered. Many fall below the standards for the reproduction of maps presented as part of a Woodland Grant Scheme application introduced by the Forestry Commission in 1996. The task of describing land use on the proposed site and neighbouring land was completed less well. While 95% of environmental statements mentioned present land use, in only 17% was this considered adequate. A further 5% made no mention of present land use. The information presented in this section such as the Beinn Leamhain, Ardtaraig and Glencassley environmental statements, was generally limited, typically restricted to naming the present land use.

> *"The application area is used in the estate as rough grazing for sheep and deer. The Glen Gour (Salachar) presently carries a total sheep stock of 500 together with a small herd of cattle"* (Tilhill Economic Forestry, 1994a).

> *"The Estate covers 3907 ha with hill land extending to 3785 ha (97%) and arable land or permanent grass accounting for the remaining 121 ha (3%). The area is*

currently grazed by hill sheep and there are small pockets of conifer plantations established primarily for sporting uses" (Scottish Woodlands, 1995b).

"Past management has been for rough grazing and sport with little evidence of overburning. The land selected for planting is of limited value for agriculture due to rocks and poor soils" (Bell Ingram, 1994a)

No environmental statement was assessed as having information on neighbouring land use of a standard to merit ranking in the highest grade. While 62% of environmental statements did contain some mention of surrounding land use the remaining 38% failed entirely to mention neighbouring land uses. Of note was the technique of describing the area of certain land uses within a given radius, this was however applied very infrequently. Most environmental statements limited information to that which could easily be acquired from a suitably scaled, quality map as seen in the Ardtaraig and Traboyack environmental statements.

"The Estate adjoins a number of other forests as indicated in Map 1" (Scottish Woodlands, 1995b).

"Traboyack is located on the south side of the Stinchar Valley in Kyle and Carrick District, Ayrshire, in an area used extensively for stock farming and commercial forestry" (Scottish Woodlands, 1995a).

In neither of the above cases, was any further information on the relative coverage of different land uses, the age structure of the surrounding forests, or the rate of change in land use in previous years presented. In cases where 'over-afforestation' of an area was a perceived potential impact this information was considered vital but found lacking in many environmental statements. Special designations were covered to varying degrees of completeness - while 20% were assessed in the top two grades a further 14% failed to mention designated sites in the neighbouring area and 10% stated that there was no designatory status on the project area. Where no mention was made of designated sites the reader (without recourse to reference material) was unable to ascertain whether there actually were no designated sites, or that the environmental statement had failed to identify sites. More disquietingly, the reader could not discount the possibility that the environmental statement had deliberately omitted to acknowledge the presence of designated areas as their existence may be detrimental to the objective of obtaining Woodland Grant Scheme approval. This would however be identified as part of the Woodland Grant Scheme application process carried out by the Forestry Commission.

4.5.2 Identification & Evaluation of Key Impacts

4.5.2.1 Scoping

Review Sub-category Elements

Within an environmental impact assessment there will be a wide range of possible areas of information that may require investigation and subsequent presentation and analysis of data. Obviously, in any one case not all of these areas need be covered. Indeed the concept of the environmental statement is to focus on only the salient points, concentrating attention on those areas which may be affected by the proposal, and discarding through an open process those areas which are not considered to be important or significant. The most effective way of concentrating attention and minimising effort is through a scoping exercise. A robust scoping exercise is one which first identifies potential scoping participants, individuals and organisations who have a stake in ensuring that an optimum decision is made and invites their participation in the assessment. With this technique, although some consultees may not wish to comment further, having perused background information on the project and the site, it is their decision to do so. The possibility of the environmental impact assessment being denounced as not having consulted widely enough can therefore be avoided. The withdrawal of participants serves to identify elements which the relevant experts have deemed either not to be impacted or not worthy of assessment. These elements can therefore be scoped out of the assessment. However this reduction in the number of issues should be done in an overt manner.

For those participants who remain within the process and the environmental elements which remain the subject of discussion, the process of scoping should not just be a case of identifying those broad environmental elements which are considered to be at risk of adverse impact. In the same way that screening focuses attention onto those projects which are considered to hold the most important potential effects out of the many projects that are initiated, scoping can be thought of as further concentrating attention onto only specific environmental elements and particular parts of the project. In any one project there may be myriad potential impacts. Only some of these will be considered to be worthy of further investigation. The remainder are of little consequence and are seen as being at a level or intensity that can be tolerated. Scoping is the transparent mechanism through which this direction of attention is carried out. If this is not done in a open manner the environmental impact assessment may be open to question as to who decided on which topics should be investigated and whether or not the correct elements were identified. An open scoping process also avoids suspicion that the assessment team or environmental statement author had purposely guided the assessment away from elements which were likely to have significant adverse impact. By far the best way to illustrate that a satisfactory scoping exercise has been carried out is to summarise correspondence from

consultees and minutes of scoping meetings and to have these ratified by the interested parties. Subsequently there can be no claim made by any party that the requirements of the environmental impact assessment were not stated or understood. The use of tools such as checklists, matrices, networks and models or the Delphi technique may be appropriate and where included should be described and their results provided.

Scoping should attempt to present clear guidance on the selection of environmental elements that should be investigated. A starting point could be the reasons identified by the Forestry Commission, which suggests that an environmental impact assessment is required for the project. However this must go beyond identifying potential impact on broad categories such as flora or water. These are far too vague and result in wasted resources and environmental statements which have their clarity impaired by the inclusion of non-essential information. For example, if a potential adverse impact is recognised on the hydrology of an area, the scoping process should identify whether the important element is water quality or water quantity. If water quality has been identified, scoping should distinguish whether the area of concern is the impact on pH, turbidity, O_2 level or concentration of nitrates for example. Only through narrowing the field of interest will assessments bear useful material, otherwise resources are spread so thinly across such a wide range of topics that the depth of information is not sufficient to allow any fruitful assessment of impact to be made.

In some cases the individuals and organisations invited to take part in scoping exercises may be at the forefront of research and understanding within their particular field of interest. The scoping exercise also provides the opportunity to utilise this body of specialised knowledge in order to pinpoint techniques for use in field surveys and ensure that these will provide valid results. Similarly the opportunity may arise for predictive techniques to be identified and approved as acceptable. Without this check, when dealing with highly specialised subjects, it is very difficult for the non-specialist to ascertain whether or not the techniques employed are valid. This again may call the legitimacy of the assessment into question. This does not mean that the consultees involved in the scoping process carry out the assessment, rather they ensure that the techniques applied within it are suitable for the task and will present reliable information to the decision making process. Further, the scoping exercise may also be utilised to validate thresholds of concern, in cases where there is no existing legal threshold or guideline. Figure 21 highlights the use of a scoping exercise within the sample of environmental statements studied here.

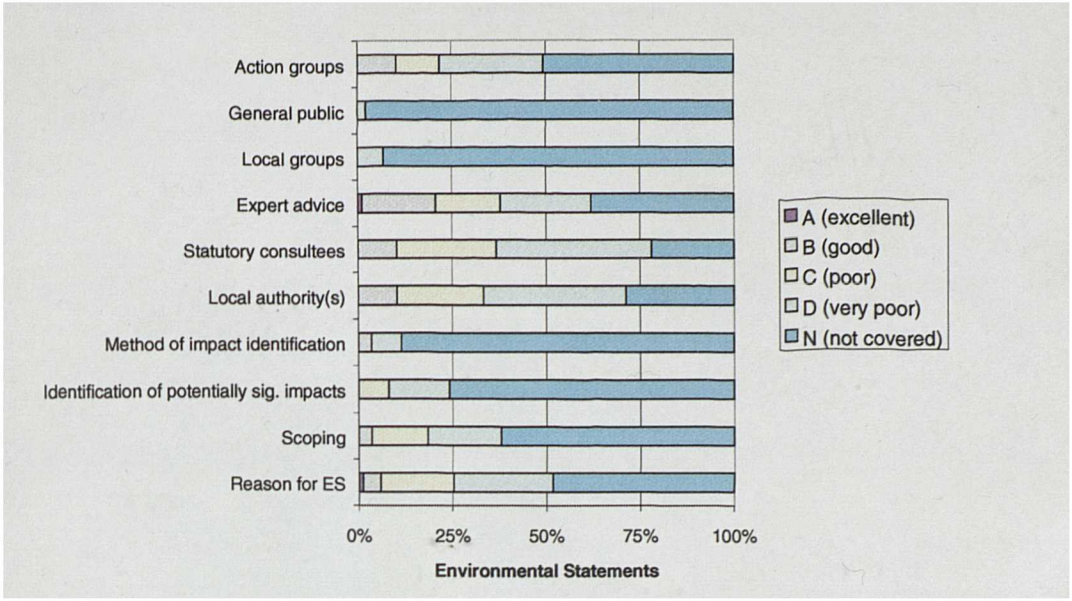


Figure 21. Review results: identification and evaluation of key impacts – scoping.

Without having the general agreement of the scoping participants, the environmental statement author is at liberty to select threshold of concerns which may or may not be appropriate. This could lead to impacts being attributed the wrong level of significance, or result in delays for the project following submission of the environmental statement while discussion is carried out on how the determination of impact significance should be assessed.

Review Sub-category Findings

While 52% of environmental statements made reference to the reasons the environmental impact assessment was initially called, in only 6% of cases was the information of a standard which could be described as acceptable. Only 38% of environmental statements mentioned any form of scoping exercise. In the majority of cases this was a desktop exercise noting points from consultees' written representations. In cases where a 'live' scoping exercise was carried out as round table discussion, the presentation of information or consensus of opinion gained form this activity was generally very poor and not utilised to its full potential. The elemental failure not to carry out a scoping exercise, or when one was carried out, to fail to utilise the results may have contributed to the lack of focus or direction evident in many of the environmental statements. The majority of environmental statements presented evidence of contact with local authorities, statutory consultees and experts with 71%, 78% and 62% of environmental statements containing reference to these groups respectively. The presentation of this information was not of high standard for any of the three categories – unsubstantiated comments were frequently inappropriately accredited to many organisations. A common practice was to merely append statutory consultees comments as photocopies of original missives with very little information presented in the main text of the environmental statement

but directing the reader to appendices which were often double or three times the length of the main text of the environmental statement. This technique, as evident in the Beinn Chreagach environmental statement, was not regarded as an efficient mechanism to present information.

> *"The proposed area comes within a designated Environmentally Sensitive Area and exceeds 100 hectares of new planting. Preliminary consultation took place at a site meeting on 3rd November 1992, convened by the Forestry Authority. Representatives were invited from the following bodies... Issues brought up by the various bodies, either at the site meeting or in correspondence (see Appendix D) have been addressed"* (Wathen, 1992).

Surprisingly, considering the often highly specialised nature of discussion topics and the array of context specific techniques employed in the environmental impact assessments 38% made no reference to enlisting the assistance of outside expert advice. This is unfortunate, as it is highly unlikely that an individual (the environmental statement author) will have sufficient depth of knowledge to be able to provide expert analysis and opinion across the wide spectrum of subjects commonly found in environmental impact assessments. Best environmental impact assessment practice suggests that although the environmental statement author may be a generalist, the utilisation of experts in specific fields is essential for a robust investigation. 49% of environmental statements mentioned comments from action groups such as RSPB, however, in only 10% was the presentation of useful information considered of an acceptable standard. Despite public participation in the decision making process being a major tenet of environmental impact assessment only 7% of environmental statements mentioned local groups and only 2% made any reference to the general public in the scoping phase. In both elements all environmental statements received the lowest (D) grading. Where presented, the information was limited to an unsubstantiated statement that the general public and local groups had been contacted. In one case the environmental statement stated that a public meeting had been held but restricted the information provided to the date and location. No record of public comments received as a result of consultation exercises was provided in any environmental statement.

None of the environmental statements reviewed contained an objective rationale of why particular items of the environment or possible impacts were included within or excluded from the assessment. This omission combined with the absence of an open scoping exercise may leave the validity of an assessment open to question. In addition, contrary to the purpose of scoping, only 24% of environmental statements made any attempt to identify potentially significant impacts in a definitive manner. Scoping was generally unfocused and gave the reader little indication of what could be expected to be rigorously investigated within the

environmental statement and what could justifiably be disregarded from further examination, or the reasons behind and level of consensus in the scoping exercise on these decisions. The Wandell Hill environmental statement illustrates the commonly found lack of overt scoping and failure to sufficiently focus on the precise elements of interest.

> *"The Forestry Authority called for an Environmental Assessment because the 152 hectares proposed for afforestation on Wandell Farm lies within the Central Southern uplands Environmentally Sensitive Area and the South Clydeside and Tinto Hills Regional Scenic Area and could have a significant impact on the environment. The key issues to be addressed within the assessment are: the landscape, particularly from the A73, A702 and Tinto Hills; the bird communities present within the WGS application; the semi-natural vegetation communities"* (Scottish Woodlands, 1993a).

Some environmental statements, although suggesting that a scoping exercise has been carried out, then failed to make use of the output of the process. At Traboyak Farm in a letter to the environmental statement author on 4th September 1995, the District Inspector of the Clyde River Purification Board stated that there were no objections to the proposed scheme provided the work was carried out in accordance with the Forests and Water Guidelines. If the Clyde River Purification Board is accepted as a competent expert this should constitute sufficient evidence that impact on water bodies is not considered to be a major issue and should therefore be scoped out of the assessment. However the introductory pages of the environmental statement included potential impact on water quality as a key issue to be assessed. Only two possibilities can be suggested for this anomaly. Either the environmental statement author did not fully appreciate the mechanism of scoping, or the assessment of impact on water quality was included deliberately to feature as many non-significant impacts as possible in the environmental statement. Considering the meagre baseline data and poor quality of assessment the former is believed to be more likely.

> *"The key issues to be addressed within the assessment are the impact on: the flora and the birdlife; the water quality; the landscape of the Stinchar Valley, and; the existing designations"* (Scottish Woodlands, 1995a).

As evidence of a scoping exercise having been carried out the Ardchattan environmental statement includes 21 pages of consultees comments. These are unabridged photocopies of consultees' missives to the environmental statement author and Forestry Commission and have not been distilled or edited in any way. In this format it is very difficult to ascertain which of the many issues raised by the consultees are the key ones. All the consultees have a long list of

issues they would like to see addressed given unlimited time and resources, however without further information it is impossible for the reader to check whether or not the environmental statement has selected the correct issues for assessment. The inclusion of a brief minute of the scoping exercise agreed by the consultees would have dispersed this concern. The Ardchattan environmental statement also insists that the views of the public have been included in the scoping exercise. There is however, no evidence to substantiate this claim. There are no attributed comments or results of survey work or questionnaires. In addition the impartiality of estate stalkers, the only attributed 'public' commentators included within the environmental statement, who may be reliant on the proposal and Estate for their continued livelihood could be questioned.

> *"The first step was to discuss the idea with many local people both professional and chiefly non-professionals – those working on the land, stalkers and so on. At all stages there has been considerable interest and support locally and the tenant farmer and his son expressed an interest to become involved in such a scheme, and their views and interests have been taken into account in the proposals. At a later stage the general public will have another opportunity to comment on the scheme when the proposals are formally advertised – local people in advance of this" (Atholl Estate, 1995).*

The Ardtaraig environmental statement was typical in illustrating the poor handling of scoping. The environmental statement gives no indication of who was involved in the selection of issues for assessment. Further, the issues described are very broad. Identification of the species of birds thought to be potentially impacted and the specific elements of water chemistry would have sharpened the scoping and focused attention. In addition the environmental statement gives no indication of what is meant by the term secondary issues. If this denotes a potential impact of lesser importance, the question arises as to whether or not the issue still constitutes a key concern. If it is not, the issue should have been scoped out of the assessment.

> *"The key issues to be addressed within the assessment are: the impact on birds of prey and important moorland bird species; the water quality i.e. sediment load and water chemistry; the loss of farmland and farm production, and; landscape. Secondary issues to be addressed are: the impacts of the development on nature conservation, mainly the plant and native broadleaved woodland interest, and the saltmarsh outwith the scheme; tourism."* (Scottish Woodlands, 1995b).

4.5.2.2 Baseline Conditions

Review Sub-category Elements

This section reviews three main areas:

- The environment;
- The socio-economic situation;
- The methods by which the above were measured.

Baseline data are a critical element in the assessment process, and the coverage of baseline conditions is the foundation on which subsequent analysis is built. As noted in Section 4.4.1.2 the form of information that is required is often highly detailed and must be specific to the situation under examination. However, Treweek (1996), Atkinson, Bhatia, Schoolmaster and Waller (2000) and Byron, Treweek, Sheate and Thompson (2000) suggest that the treatment of ecological and biodiversity issues often lacks rigour within assessments. Environmental impact assessments attempt to address potential specific impacts arising from one project in one location. To deal with generalities is therefore wholly inadequate. Baseline data must be provided in a format which will allow it to be later utilised in the assessment of impact significance. In most cases this requires information to be quantified. The presentation of, for example, the number of breeding pairs of a species of bird at the present time is not enough. One is attempting to ascertain what effect the project will have on environmental elements. It is therefore essential to know what other outside factors may be influencing the same environmental elements. For this reason baseline data should include a prediction of the without-project scenario. This predicts the fortunes of the environmental element as it would occur should the project not take place. This can be important in certain situations. For example, a population of breeding birds may already be in decline before project implementation due to factors such as predation, reduced areas for feeding due to other reasons or disease. As forestry projects are by their nature long term it is only reasonable to expect that without-project baseline predictions are similarly time bound. It is accepted that prediction of this type of information may be extremely difficult to carry out, therefore information could be presented in the form of best and worst case scenarios. Regardless of the approach eventually used, it is essential that information is also provided on the methodologies employed in primary data collection, the techniques used in making without-project predictions and the limits of confidence attributable to these predictions.

In addition to stating what the without-project status of an element, for example, the number of breeding pairs of a bird species, it is important to attempt to qualify this, wherever possible using reputable techniques, with the importance of this population. In particular the reader requires to know if the element is rare, of local, national or international repute and how

sensitive the element is to outside influences such as those associated with the proposal. Figure 22 illustrates the coverage of baseline data within the sampled environmental statements.

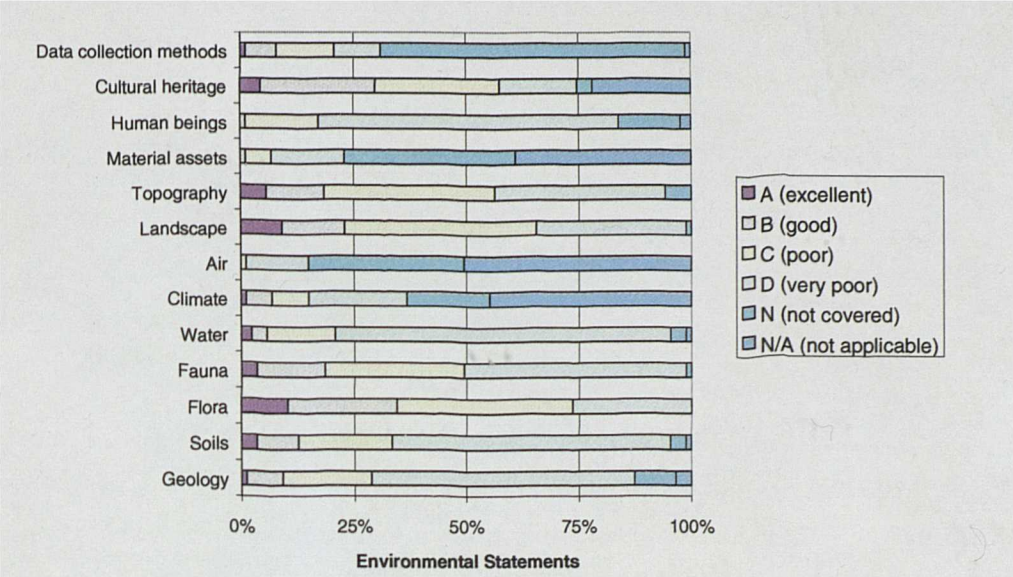


Figure 22. Review results: baseline conditions.

Without a comprehensive, quantified baseline including the without-project scenario, it is impossible to later assess the importance of a specific element and the possible effect the project may have. The quantification of baseline data for socio-economic elements can be fraught with difficulties. It is extremely difficult to place a direct numerical value on a landscape for example. In cases such as this indirect evaluation is considered to be the only alternative. Measurement could be made of the utility of the landscape, how much people value it in the without-project scenario. Again the typical longevity of forestry projects must be taken into account and consideration must be given to the different phases through which a project may pass during its life cycle.

Review Sub-category Findings

In general the description of baseline data was poor, very few environmental statements contained quantified data. The most successfully completed were baseline data for flora and fauna and landscape, with 34%, 18% and 23% of environmental statements containing adequate information for these items respectively. However some items were very poorly covered. For example 93% of environmental statements provided inadequate or no information on water courses and water bodies. The absence of baseline data was noted in cases for elements specifically mentioned as requiring investigation by the Forestry Commission and consultees within the accompanying case files. In many environmental statements the information that was presented was restricted to the names of the major water bodies and their direction of flow.

The environmental statements for Finnart & Invercomrie, Southdean Farm and Hill of Foudland illustrate typical entries.

> *"Hydrological features which might be affected by the proposals are Loch Finnart, Loch Monaghan and their associated bogs, and the streams which issue north to Loch Rannoch. The principle watercourse is the Camghoutan Burn on the east march (which also takes water from Loch Monaghan), and Madaig and Allt a' Mheanbh-cruidh to the west, both also flowing north"* (Tilhill Economic Forestry, 1994b).

> *"The Jed Water forming the northern boundary to the area is the main watercourse. The Jordan Sike and one other minor burn discharge into this river from the proposed planting area"* (Scottish Woodlands, 1993c).

> *"The proposal area forms part of the upland block which lies on the watershed between the River Bogie valley to the east, which is an eastern tributary of the Deveron River system draining to the north, and the Ythan and Don River systems draining to the east. All drainage run-off from the scheme area supplies minor streams feeding into the River Urie, which is a northern tributary of the River Don. The area is predominantly dry. Spring basins, however, occur in the peaty sections, and three other separate spring sources rise on the northern slopes of Foudland Hill. Several private water supplies are sourced within these areas"* (Mitchell, 1994)

In cases where potential impacts on water bodies or hydrological features have been identified, the environmental statement must present baseline information which will allow an assessment to be made. The above examples provide no assessable information, failing to present any additional information which could not be accessed through a suitable map. The majority of assessments were unguided in the information which was submitted. Rather than identify that the potential impact was one of a possible change in pH and limit presentation to this subject, any information on water quality or quantity which could be (easily) obtained was presented. In many cases information was limited to rules of thumb, or data taken from trials and research projects which were not proven to be analogous situations in terms of soils, geology, slopes or ground cover. Also interesting to note was the unwillingness among environmental statements to identify those elements for which it was not necessary to present baseline data. 45% identified climate and 51% identified air quality as not requiring baseline data to be presented. Of the remainder (which were therefore assumed to require assessment) only 5 environmental statements held information of a standard which could be utilised. In the majority of cases the

inclusion of any information regardless of relevance or usefulness was preferred to stating that the element was not considered as worthy of inclusion in the assessment. This common trait lead to many environmental statements being unnecessarily cluttered with information from which the reader could not easily ascertain whether it was being given as baseline data, which would subsequently be used in an assessment of impact, or background information on the site and its environs. Since most of the information presented as baseline data contained no quantified material it is very difficult for the reader to self sift. Coupled with the repeated lack of adequate scoping, where the exact focus of attention was never adequately identified many environmental statements left the reader wondering if statements such as the following should be ignored or regarded as critical to the assessment process. This is highlighted in the Hill of Foudland, Invercassley and Queensberry environmental statements.

> *"Over the Scottish Highlands air quality is considered to record the lowest pollution levels in the British Isles"* (Mitchell, 1994).

> *"Rainfall decreases from 2500 mm at the head of the Glen to 1500 mm at its south end and wind generally blows down the Glen rather than up"* (Bell Ingram, 1993a).

> *" The solid geology is from the Silurian era and consists mainly of greywhackes, conglomerates and shales. The area was subject to glacial action in a southern direction to form the mountains of the hillocky landscape. Glacial deposits cover much of the area"* (Waugh, 1996).

While many environmental statements contained references to or appendices of very detailed and high quality survey results of flora and fauna, these were rarely used to full potential. No environmental statement contained specific reference to a prediction being made of the future without-project base line of an environmental element. Any assessments that were carried out were based on current figures. The presentation of quantified information was extremely rare. Few environmental statements gave population numbers in the case of fauna or the spatial extent of species, without which the assessment of impact becomes difficult if not impossible. Typical entries are illustrated by the Auchtertyre, Bishop Hill, Glencassley and Invercharron environmental statements.

> *"Golden Eagle, Buzzard and occasionally Sparrowhawk are noted to hunt over the area. Otters frequent the streams and a badger's set is located in Allt Glaenn Udalair"* (Bell Ingram, 1990).

"The main vegetation types are calcareous grassland, peat bog, flushes and marsh sedges, heathland and acidic grassland" (Shand, 1992).
"Breeding birds such as meadow pipit, wheatear, skylark, curlew, snipe and lapwing occur on the site. The area does not seem to have a great deal of vertebrates there are currently no hares or rabbits, there are obviously small rodents such as field mice and voles and evidence of their main predators fox, weasel and stoat" (Shand, 1992).

"The Glen is rich in wildlife of both local and exotic origin. A Golden Eagle has been known to nest in the remnant pinewoods where pine martins and badgers also exist" (Bell Ingram, 1994a).

"A variety of woodland bird species thrive on woodland margins where they have shelter, nesting sites and access to the prolific insect life on the open moorland. Species include goldcrest, siskin, redpoll, greenfinch, chaffinch, tits, blackbird, song thrush, willow warbler, wheatear and pied wagtail" (Bell Ingram, 1993b).

A number of environmental statements deliberately withheld information on grounds of sensitivity or commercial confidence as illustrated in the Ardverikie environmental statement.

"The only species of note observed within the scheme was golden plover – these birds were seen on several occasions on the open summit of Meall Arduighe. No other rare species were recorded within the scheme boundary. The exact locations of the rarer bird's nests is not publicised to minimise disturbance" (Finlayson Hughes, 1996).

While it may well be prudent to withhold certain information from general public release itis not considered acceptable to withhold information from the decision-maker. The whole point of environmental impact assessment is to provide the decision-maker with as full a picture as possible so that all benefits and disbenefits are considered in the decision making process. To deliberately restrict information is therefore contrary to good environmental impact assessment practice. Sensitive information can be presented in a limited circulation edition of the environmental statement with redactions or as an addendum for general release. Wherever information is withheld from the public this should be acknowledged within the environmental statement.

Where survey reports were included many would provide exhaustive lists of species found on the site but would give no indication of numbers or extent. In addition, most failed to include any details on the importance of the site for the element in question, for example as a breeding

ground for a large percentage of the entire UK population of a species, the last stronghold of a species, or an exceptional example of a geological or archaeological feature. Rather than being surveys commissioned specifically for use within an environmental impact assessment, tailored to provide information to permit assessment of a specific potential impact, general surveys were carried out and subsequently general reports were presented. These did not always present information in sufficient detail on the pertinent topics, but rather gave broad coverage with little depth. Again this could be due to the notable lack of adequate scoping. In addition most surveys were presented as expert reports and were written for use by experts in the particular field. This in itself would not present a problem if the environmental statement then restructured the information for use by the general reader and decision maker. Most however, merely referred the reader to the appended report without any interpretation. The layperson, which could include the decision-maker for certain topics, may therefore be unable to easily extract the pertinent information from the report. There is therefore no mechanism through which the lay reader can make a judgement to agree with or contest any statements made within the environmental statement.

A number of environmental statements attempted to carry out an assessment on potentially impacted elements without any baseline data. Of particular note was the West Willows environmental statement where no data was collected. The environmental statement did prescribe a bird survey to be carried out at a later (unspecified) date, by which time the project would have been initiated, and the true without-project baseline would not be measurable. Also with the project already initiated the purpose of such a survey would be questionable. The presentation to, and acceptance by the Forestry Commission of this standard of baseline information gives serious cause for concern, whether or not the assessment process is adequately understood within the sector by either environmental impact assessment practitioners or the Forestry Commission.

> *"During the short time available for the initial preparation of this statement it has not been possible to carry out a full study of the bird population in the area. A full study of the bird population in the breeding season is intended so that the effects of planting can be gauged upon the changes in habitat"* (Hall, 1994).

> *"No comprehensive survey of vertebrate or invertebrate fauna has been carried out. The following have been noted from casual observations: mole, field vole, mountain hare, rabbit, red deer, roe deer. It is expected that in the Sphagnum areas large populations of crane fly exist, and various beetles particularly ground beetle. In the bog area the invertebrate population will be large containing Enchytracid worm, springtail and mite"* (Hall, 1994).

Baseline data for landscape and visual information was included in all but a very few cases but was generally of poor quality. While most environmental statements made good use of photomontages, overlays and computer generated projections were used in a very small number of cases. Very few environmental statements presented any further information. While it is acknowledged that the subject of landscape impact lends itself to assessment through a visual medium, the common approach of merely referring the reader to appended landscape assessments was considered inappropriate. In most cases such as the Glen Bruar, Glen Uig and Inverchoalin environmental statements these landscape assessments were limited to a series of photomontages and sketches without any interpretation of potential impact. No environmental impact assessment identified that any opinion was being presented other than those of the environmental statement author or the (usually anonymous) landscape assessor. Rather than open assessment, most of the landscape appraisals were written to corroborate that the woodland design (frequently also carried out by the environmental statement author) was beyond reproach and its beneficial effect on the landscape was presented as fact rather than opinion. While the quality of photography and artwork was exceptional in many cases this technical and artistic mastery should not be mistaken for adequate baseline data, which requires description and interpretation of landscape features. While the use of expert testimony can be invaluable in abstract topics such as this, the inclusion of the perception of the public should not be overlooked. A large number of environmental statements presented lines of force diagrams in which illustrated lines of force from an imaginary elevated position above the mapped area. The true benefit of lines of force diagrams is found when examining lines of force from a specific viewpoint. Since few people will actually view the area from a position directly overhead, such presentation was considered inappropriate and suggests a lack of understanding of the techniques of landscape assessment.

> *"Landscape considerations are always considered important by Atholl Estates, but on this particular application, the close impact is fairly low compared with say, the Deuchary Hill application which is viewed by many hundreds of walkers, or the Clunes project with close open views over a large section of the A9. Probably the most important public viewing of the area is the southern slope viewed from the A9 lay-by just to the north of Blair Atholl. There are other more distant views, and close views from the footpath running to Calvine. The rocky peaks and crags, though not striking, are the chief features to be protected, and over all, this is a fairly uncomplicated site for which the Landscape Presentation, photographs, and species map give a fair indication of what will be on the ground"* (Langton, 1994).

"While the main landscape issue relating to this project has been its external appearance, the internal forest design has been considered. The internal structure of the proposed forest is designed to give a large number of irregularly shaped areas of commercial conifers set in a matrix of large areas of bare land and further enhanced by areas of planted and natural broadleaved woodland. This will provide an interesting and diverse forest structure" (Tilhill Economic Forestry, 1992).

The coverage of socio-economic elements was very much poorer, in general, than the physical environment. Very few environmental statements contained information of sufficient depth and quality to achieve an A or B grading. Only 23% of environmental statements included baseline data on material assets, a further 39% assessed the element as not applicable. Where information was presented only 1% of this was assessed as being of an adequate standard. Although the coverage of material assets is mandatory in an environmental statement, either through full assessment or stating that coverage of the element is not necessary, 38% of environmental statements contained no reference. This omission in itself is sufficient to render these environmental statements unacceptable, however all were accepted by the Forestry Commission. No mention by the Forestry Commission of the failure to cover a mandatory element was found in any of the supporting case files.

While 72% of environmental statements provided baseline data for recreation or deemed it not applicable, only 1% of the environmental statements were graded as being of an acceptable standard. Similarly for visual environment within the project area and employment, while 68% and 76% of environmental statements presented information, in only 12% and 9% of cases respectively was this graded as being of an acceptable quality. Again there was a conspicuous absence of quantified data. Information was rarely attained through credible survey techniques. Most of the information presented was derived through unsubstantiated conjecture, from unattributed sources or personal comment from the environmental statement author. Very few environmental statements made any attempt to quantify exactly what level of recreational use was made of project sites. Most presented information which was of little or no further use in the assessment process. The Hill of Foudland environmental statement illustrates typically vague baseline data.

"Hill walkers and ramblers often use Foudland Hill for recreation, their access being facilitated by the track up the eastern shoulder servicing the communications complex on the summit; from this hilltop, fine panoramic views can be obtained" (Mitchell, 1994).

One element for which quantified information was presented was employment. However, in many cases this was not site specific, but based on generalities or rules of thumb which did not allow the reader to ascertain exactly what the current level of employment was for the proposed project area. Other environmental statements, such as Glencassley, gave descriptive coverage of employment but failed to support this with quantified information.

> *"Within the vicinity there are few opportunities for employment and these are mainly confined to land related activities such as farming, forestry, gamekeeping or fishing. The expansion of forestry has also created new employment for the agricultural tenant of Glen Cassley estate and circumvented further depopulation"* (Bell Ingram, 1994).

In addition to describing employment on the project site, to understand employment in a wider context it was felt necessary that the environmental statement should present employment statistics for the local area, describing rates of unemployment and the relative importance of various sectors for employment. Many of the environmental statements, such as Philips Mains and Invercassley, failed entirely to present current and predicted future without-project baseline figures on employment but made unsubstantiated claims that the project would result in an increase in employment opportunities without any baseline data or an overt assessment process. Where data were given these were frequently without supporting references. Concerns over bias and the understanding of the assessment process by the environmental statement author are raised when such inappropriate claims as those given below are made in environmental statements.

> *"In Highland, if one assumes inter-regional flows of forestry employment are in balance, the forest area generates employment at the rate of 6.6 jobs per 1000 ha. It must be borne in mind however that a significant proportion of forestry jobs are seasonal and short term"* (MacKay, 1993).

> *"Work will be created for those willing to fence, plant and cultivate. The potential for further employment will increase as the forests mature providing the opportunity for alternative work during quiet periods of the farming year."* (Bell Ingram, 1993).

To ensure the rectitude of the predicted baselines, the environmental statement should also clearly identify the methods used in the collection of information and techniques employed to predict future without-project baselines. All information presented in an environmental

statement must be verifiable, hence sources of secondary information must be adequately referenced. Similar qualification must be attendant for information which is derived from primary data collection through field surveys. In order to allow the reader to have confidence in the figures presented, the methodologies used for sampling, measuring and analysing must be clearly stated. Without such information the reader cannot be certain that sampling has been carried out at an appropriate level and without bias. As an example one environmental statement included a survey of bird species present on the site, the results of which indicated that the area held a very limited number of individuals and species. No details were presented on the methodologies employed in the survey, leaving the reader to accept the survey results at face value. On examination of the accompanying case file it was discovered that the survey had been carried out during the winter months at a time when migratory species would be absent from the site. Only 31% of cases made any attempt to describe the methods through which the data was collected. 69% of environmental statements made no reference to data collection methods.

4.5.2.3 Prediction of Impact Magnitude

Review Sub-category Elements

The assessment of impacts can be seen as having two parts, prediction of the magnitude of the potential impact and determination of the significance of the impact. To adequately assess potential impact magnitude the environmental statement must gauge the expected deviation from the baseline, for example, the change in mean stream flow rate. The environmental statement must also give an indication of the duration and reversibility of the impacts, together with estimation of the probability of the impact occurring and level of confidence in the predicted figures. As noted in Sections 2.7.2 and 4.5.2.1, the brevity of this part of the assessment can be improved by preliminary discussion of appropriate techniques during the scoping phase, outlining which techniques will result in reliable assessment. It is essential to acknowledge that the ultimate usefulness of the assessment is dependent on the quality of the information gathered and the future predictions presented as baseline data. It is here that predictions of the future with-project environmental levels are made. The environmental statement author must determine what the effect of the project will be on the predicted without-project baseline level. George (2000) provides detailed discussion on methods of and approaches to impact prediction and evaluation. Similar to the estimation of without-project baseline levels, this may be difficult to predict, however through empirical or numerical methods one must make a prediction on the with-project level. Elements which can be readily quantified such as peak flow rates or numbers of breeding pairs may be handled relatively simply. Where direct prediction cannot be done the environmental statement author must apply similar secondary techniques to those used in presenting baseline data, quantifying the loss or

change in utility gained from the environmental element (for example landscape) in the with-project scenario. This does not mean that complicated methods must always be employed. George (2000) notes that the techniques used should always be appropriate to the circumstances.

In addition to clearly describing the environmental element which is potentially impacted, the environmental statement should unambiguously detail the change accounted for by the project. Details of the duration of the impact, whether or not it is reversible, together with details of probability outcomes and the confidence which can be attributed to the predictions should be given. While not entirely accordant with environmental impact assessment as a project-based tool, it is often useful to provide details of cumulative impacts. The environmental statement must then evaluate the change in environmental baseline attributable to the project in relation to a prescribed threshold of concern. In short the environmental statement must make a clear determination as to whether the potential impact is significant, and is therefore unacceptable in its present form and requires amelioration. Alternatively, the impact can be considered to be of a magnitude and severity which is acceptable and can therefore be evaluated as non-significant. As discussed in Section 4.4.2.1, the threshold of concerns chosen and the mechanism through which this is done carry additional authority if this has been discussed and ratified through the scoping exercise. George (2000) notes three main forms of significance:

- Institutionally recognised significance, through legislation, policies or standards
- Publicly recognised significance, through opposition, controversy or conflict
- Technically recognised significance, based on a technical understanding of the consequences.

It is essential, however, that full description of the methods employed to select the threshold of concern and any assumptions which must be acknowledged when using the predictions, are adequately presented. Figure 23 illustrates the coverage of impact evaluation.

Review Sub-category Findings

This collection of tasks was in general carried out to a minimal extent. In 54% of environmental statements the description of the variable under investigation was determined to be absent - examples such as water or flora being too broad categories for the level of detailed evaluation necessary in environmental impact assessment. In only 8% of environmental statements were variables adequately described. 86% of environmental statements failed to make any mention of possible deviation from baseline data. This is thought to be due to the fact that most environmental statements failed to supply adequate baseline data on which to comment.

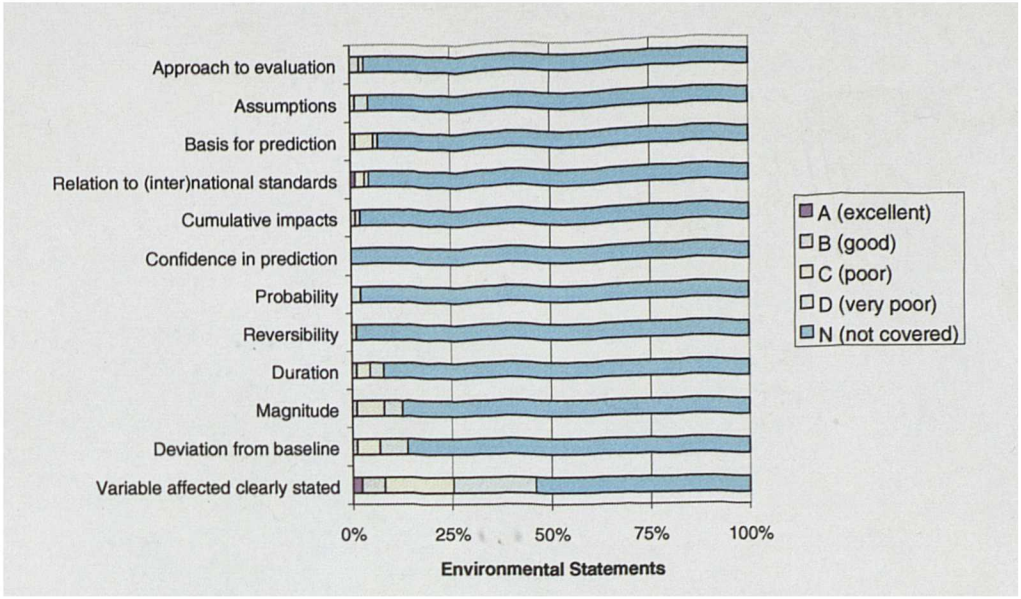


Figure 23. Review results: identification and evaluation of key impacts – magnitude.

None of the environmental statements made any reference to the limits of confidence which should be attached to the data. In addition, 93% of environmental statements failed to make any reference to the approach to evaluation taken, that is the method by which significance of the impact was gauged or measured. The poor standard of assessment in the majority of environmental statements may be explained by a general lack of understanding of the assessment process, where 'site assessment' had been taken to mean an assessment of the importance of the environmental element under discussion rather than an assessment of the proposal on that element. This is illustrated in the Wester Guisachan environmental statement, when introducing a section entitled Assessment of Impacts.

> *"This section assesses the importance of species or communities found within the areas under proposal or which might be affected by woodland development"* (Tilhill Economic Forestry, 1996b).

The environmental statement then provides a list of bird species and names the various pieces of legislation under which they are afforded importance or protection. Such as golden eagle – Schedule 1 of Wildlife and Countryside Act 1981, Annex I of the EC Bird Directive, Appendix II of the Berne Convention; red grouse Annex II/III EC Bird Directive, Appendix III of Berne Convention. The environmental statement then fails to deal adequately with impact significance, making an unsubstantiated claim rather than making assessment in an open and verifiable manner.

> *"The risk of fences to species of grouse is recognised but an implied objective of the scheme is to provide new habitat for capercaillie and black grouse. While bird casualties are probably inevitable and would thus slow the rate at which optimum*

densities of capercaillie and black grouse might be achieved the ultimate provision of suitable habitat would be of net benefit to these species, and to other specialised species of the Caledonian forest" (Tilhill Economic Forestry, 1996b).

The Strone environmental statement illustrates the typical failure to predict the magnitude of impacts by discussing the importance of the element for, rather than the effect of the project on avifaunal and landscape elements.

"The site is used for hunting by a small number of raptors which include three species protected under Schedule 1 of the Wildlife and Countryside Act; under Annex I of the EC Birds Directive; and Appendix II of the Berne Convention" (Scottish Woodlands, 1996).

"The proposals must maintain and enhance the landscape quality of the area and integrate with existing features. Visual force analysis, photographs and photomontages are included in Appendix 5" (Scottish Woodlands, 1996).

This is followed by a statement on impact significance which is completely unsubstantiated in the case of bird species. In the case of landscape assessment comment on significance or otherwise of impact is replaced by a statement that woodland design has been carried out in a conscientious manner.

"In view of the possible increase in live prey species outlined above, it is expected that the loss of feeding area through regeneration and afforestation will be compensated for by live prey availability in the short to medium term" (Scottish Woodlands, 1996).

"The blocks have been carefully designed to fit into the existing landscape and provide multiple benefits in terms of additional diversity through the introduction of native Scots pine, and commercial value as well as amenity/conservation value" (Scottish Woodlands, 1996).

4.5.2.4 Assessment of Impact Significance

Review Sub-category Findings

Many environmental statements failed to give a definitive determination on the significance of impacts. The Ardtaraig environmental statement highlights an increase in run off but does not indicate whether this will be a significant or non-significant impact (the inappropriate assessment of possible impact on water quality was also noted during the review). In the case of the Castle Hill environmental statement, while there may well be an increase in carbon

fixation attributable to the proposal it is unlikely that this will be a significant increase in either national or global terms given that the project extends to only 149 ha. The Blackmount environmental statement does identify a significant effect for the change in vegetation length, but fails to discuss whether or not the impact on breeding habitat for insect species is significant, the real issue of importance.

> *"Although it is not possible to avoid the initial increased rate of run off following cultivation, water quality will be maintained by following current forest and water guidelines"* (Scottish Woodlands, 1995b).

> *"On a national level, the increase in carbon fixation by the trees as they mature may help to contribute to a reduction in levels of carbon dioxide. This may help to reduce any global warming effect caused by world increases in carbon dioxide levels"* (Scottish Woodlands, 1993d).

> *"The removal of grazing pressure will have some significant affect on the length of vegetation which may result in a change in breeding habitat for certain* [insect] *species"* (Scottish Woodlands, 1993e).

None of the environmental statements reviewed presented a full assessment where with- and without project predictions were given and a threshold of concern used to determine impact significance. While the term 'significant impact' was used in a number of environmental statements, the usage of the term was generally imprecise. Many environmental statements included discussion of impacts within sections entitled 'significant impacts', but followed on in the text to say that the impacts were non-significant. Others made statements that an impact was indeed significant but then dismissed it as being acceptable or inevitable within an afforestation project. Without the corroborating evidence such as with- and without project predictions and thresholds of concern it is impossible for the reader to judge whether or not there is a significant impact. Few environmental statements gave an unambiguous statement on the significance or otherwise of the impacts assessed. This imprecision made it very difficult to ascertain whether or not any significant impacts were indeed determined in the 89 environmental statements reviewed.

4.5.3 Alternatives and Mitigation

4.5.3.1 Alternatives

Review Sub-category Elements

Section 2.7 stressed the importance of full consideration of alternative courses of action available during the planning process for the proposal and identification of the process through

which the chosen alternative was selected. Glasson (1999) considers the failure of the UK legislation to require full consideration of alternatives is a major weakness. Steinemann (2001) notes that the choice of alternatives detailed within environmental statements is often subjective and arbitrary, with the range of alternatives proposed and evaluated reflecting narrow project objectives. This section reviews the coverage of alternative sites; alternative uses of the site and alternative work methods. In particular the review looks for consideration of all viable alternatives in sufficient detail to allow fair comparison. In essence the environmental statement should illustrate why the selected site and project have been identified as the optimum combination. In addition the selection of work methods should also be discussed, for example why a certain method of ground preparation has been employed. Figure 24 assesses the coverage of alternatives within the sample of environmental statements.

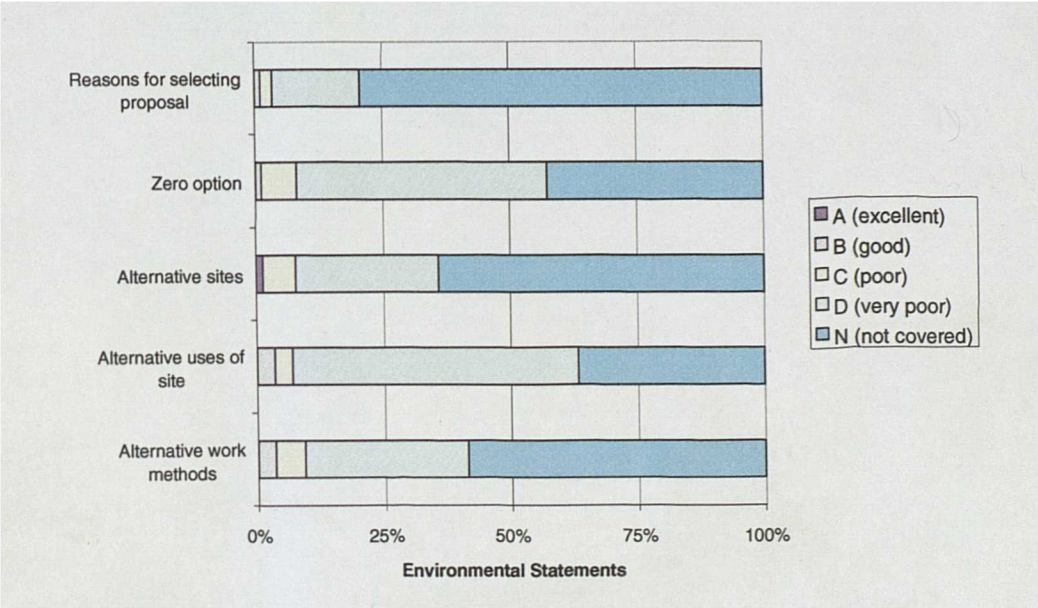


Figure 24. Review results: alternatives

Review Sub-category Findings

The coverage of alternatives was generally poor, with little more that a cursory mention of possible alternative options. In most cases the range of alternatives was described but in such little detail as to not allow a full appraisal of the alternative sites, land uses or methods of working. 79% of environmental statements failed to give an explanation of the reasons why the chosen option was selected. The case of the Western Guisachan environmental statement gives an example of how very little information was given.

> *"Lack of low ground limits alternative use. Similarly, the remoteness and difficulty of access precludes alternatives. Hill sheep farming has a doubtful future with imminent reforms to European farming. There are no sites for possible*

woodland restoration within the estate which ecologically or logistically might be considered preferable to the present proposal" (Tilhill Economic Forestry, 1996b).

In many cases the coverage of alternatives was restricted to a defensive statement that the project prescribed could be the only rational option, without supplying any supporting evidence. The Riddoroch environmental statement claims that commercial afforestation does not fulfil the owner's objectives. However on investigation of the Woodland Grant Scheme case file, none of the owner's objectives preclude commercial afforestation. This is considered to be an example of the common technique of suggesting the scheme enjoys a positive environmental status by comparison with a potentially far more damaging alternative (although one which may not be viable or achievable within the Woodland Grant Scheme). Alternatives such as large scale commercial conifer plantation, were given with inference that by comparison the selected scheme is therefore a good option. In addition the Riddoroch environmental statement fails to illustrate adequate understanding of the term zero option. In the environmental statement this is taken to mean the abandonment of the site rather than the option of continuing the present situation without the project.

"Alternative options open to this site are considered below: commercial afforestation, habitat enhancement, no activity. A commercial afforestation scheme does not fulfil the owner's objectives. Habitat enhancement would, most probably, involve controlling the number of sheep and Red deer which graze the site. Results would be of little value with only moderate increases in flora and fauna diversity expected, although it might be probable that a small amount of natural regeneration of the existing trees takes place (i.e. less than 5 ha). Finally, the option of 'no activity' would, it is believed, allow further degradation of the moor. No other location on the Estate was available for consideration as an alternative site" (Bowlts, 1997).

In very few cases were alternatives openly discussed. The Creagan Breac Glenroy environmental statement and Glen Derby environmental statement illustrate typical entries. In the case of Creagan Breac Glenroy there are no further details of why the particular location was chosen above the alternatives considered. Further details may have been able to explain that other silviculturally suitable sites on the estate were also more important in relation to flora or fauna.

"The Estate recognises the inherent limitations of its present natural resources, and considers that the alternative to the present proposal is to keep the land under open grazings. Alternative locations for woodlands have been considered, and the

present location results from discussions with Scottish Natural Heritage" (Tilhill Economic Forestry, 1996c).

Within the Glen Derby environmental statement the coverage of alternatives is considered from a different viewpoint. In this case that the scheme is the only alternative to a previously approved Forestry Grant Scheme proposal, suggesting that if this project is not permitted, the Forestry Grant Scheme proposal which was prepared under less stringent codes of environmental protection would be initiated. All other alternatives are dismissed as having been considered, but no details supporting the mechanism through which these alternatives were considered are presented.

> *"This scheme is an alternative to the chiefly coniferous timber production FGS already approved for this site, the owner having decided, chiefly for visual and environmental reasons to change to the New Native Pinewood Scheme. Other alternative uses have been considered together with considering other sites for planting"* (Langton, 1991).

4.5.3.2 Mitigation

Review Sub-category Elements

If an impact has been identified as being significant, and therefore at a level which is considered to be unacceptable, the next task in the assessment is to investigate methods which could be used to remove the impact completely or reduce it to a level below the threshold of concern, thereby making it non-significant. Such methods may be obtained by modifying the project design or by relocating the project site. Alternatively mitigation can be achieved by accepting that the impact will occur but then offsetting this by incorporating into the project additional works which will specifically repair the environment to its former state or compensate any impact by improving or creating a substitute environmental element in a form of planning gain. Nitz and Holland (2000) examined commitments for environmental management made in 285 environmental statements. While 90% of the sample suggested mitigation measures were required, in only 60% were adequate strategies provided.

Any information presented in this part of an environmental statement must conform to the requirements previously discussed for baseline data and the assessment of impacts. To ensure that claims of the efficacy of mitigation methods can be corroborated, the whole process must be carried out in an open manner. Any proposed methods of avoidance or reduction of impacts proposed must be adequately described, including full coverage of work methods and the methods of operation. From this selection the methods which will be employed should be identified and an explanation given as to why this choice was made. A prediction should then

be made on the effectiveness of the chosen method, indicating the without-mitigation and with-mitigation impact level. This should then be compared with the threshold of concern, and the earlier determination on significance reviewed. It is also important that the level of residual impact is identified. As with the assessment of impacts, details on the longevity of the mitigation effect, the confidence levels attributable to the prediction and any limitations due to assumptions should be made clear.

Review Sub-category Findings

Generally methods of mitigation were poorly covered. Methods to avoid impacts were adequately discussed in only 2% of environmental statements, with 45% failing to mention this topic completely. Methods to reduce impacts were adequately covered in only 3% of environmental statements, with 54% failing to mention the topic. Remedial and compensatory methods of mitigation were very poorly covered. Only 7% of environmental statements made any reference to the form or magnitude of any residual impacts which may remain despite implementation of the mitigation methods. Figure 25 assesses the coverage of methods of mitigation.

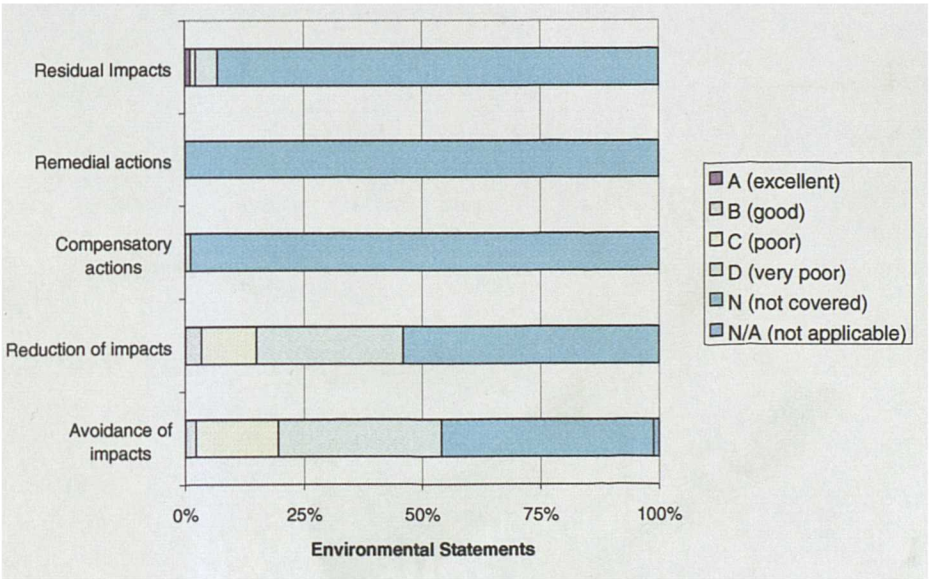


Figure 25. Review results: mitigation methods.

The Bhealaich environmental statement includes a typical entry for mitigation where no details on the methods of work (width of buffer zones) or their efficacy are presented. Further, no mention is made of the significance of the impact following mitigation and the level of residual impact. One is therefore unable to assess the residual impact against the threshold of concern (also absent from this environmental statement). No consideration is given to the width of buffer zones which would be required for adequate mitigation of the specific impacts due to the proposal on this site. The environmental statement does not give any corroborating evidence

that what is specified will be adequate.

> *"The Forsinard water supply will be protected by leaving unplanted all areas draining directly into the Allt a Bhealaich above the dam and cistern"* (Fountain Forestry, 1990a).

The Hope environmental statement includes a statement on mitigation which suggests that unless a site holds designated status development should proceed, and that the only method of mitigating any impact would be the designation of the site. The subsequent opportunities for claims for compensatory payments are considered to be one reason for this statement being included.

> *"Impacts on flora, fauna and soil may be seen as an integral part of the production process. Retention of dubh lochan systems, burnsides and hilltops as unplanted areas will avoid direct impacts on key sensitive areas, but further compromise between the costs and benefits of conservation and timber production becomes a question of land use policy. It is assumed that the Nature Conservancy Council will judge the significance of impacts on flora, fauna and soil and put forward proposals to designate proposed planting areas as Sites of Special Scientific Interest where appropriate, thereby precluding development"* (Fountain Forestry, 1990b).

The Arscaig environmental statement includes a good example of selected methods of working being subsequently presented as methods of mitigation. The environmental statement discusses methods of ground preparation and fertiliser use within the project description and prescribes a minimalist approach to ground preparation and compares the prescriptions for fertiliser use with practice on earlier schemes.

> *"There being no intention to carry out more than minimal ground disturbance to aid establishment and no mechanical activity within riparian zones, any movement of soil particles in surface run-off will be minimal and rapidly filtered by ground vegetation"* (Bell Ingram, 1994b).

> *"The requirement for such intensive fertilisation is now confined to lesser areas and this, together with considerably improved forestry practice designed to minimise impacts on the environment, should ensure that future forestry related phosphorus inputs to Loch Shin are of negligible proportions"* (Bell Ingram, 1994b).

Bearing in mind that the above were prescribed at the beginning of the environmental statement before any assessment had been made, the conclusion (given below) cannot be accepted as true

mitigation. These proposals have been part of the project from the beginning and have not been introduced to mitigate a significant impact identified through the assessment. Similar to the Bhealaich environmental statement, the Arscaig environmental statement provides no corroborating evidence on the efficacy of the prescribed methods as threshold of concerns and adequate quantified data are absent.

> *"It is concluded that, after the implication of mitigation measures previously described, there will be no measurable residual negative impact on the environment"* (Bell Ingram, 1994b).

4.5.3.3 Monitoring

Review Sub-category Elements

Monitoring and auditing within environmental impact assessment has been taken to be the observation of actual environmental baselines and project outputs and their comparison with predictions made within the environmental statement. This can mean the comparison of predicted and actual baseline levels, for both the with-project and without-project scenarios (if controls are established). This would allow one to observe that the initial figures in any predictions were in fact acceptable. Predictions of impacts could also be monitored. Obviously, of prime importance would be residual impacts which have been initially identified as being significant but have been downgraded following mitigation, especially if the environmental element in question was of particular note. Additionally, monitoring of impacts that are predicted as being very close to but below the threshold of concern would be a prudent action.

It is essential that the environmental statement provides a rationale for the selection of elements which will be monitored. A simple monitoring programme should then be established. This should contain an explanation of the objectives of monitoring (exactly what information is required) and a detailed description of the methodologies which are to be employed. The frequency of monitoring events and the duration of the programme should be made clear. The responsibility for funding and carrying out the monitoring exercise should be stated as should the audit procedure and the course of events which should be followed should the audit highlight discrepancies between predictions and actual findings be identified. In their examination of 285 environmental statements, Nitz and Holland (2000) noted that only 50% included adequate monitoring strategies. In their study of 865 predictions contained within 28 environmental statements Wood *et al.* (2000) noted that only 17% included monitoring proposals. It should be noted however that within the UK environmental assessment legislation monitoring is not a mandatory element. Glasson (1999) notes that this is a weakness in the UK system and that environmental impact assessment practice should be moving away from being

used merely to obtain approval and incorporating it into project management.

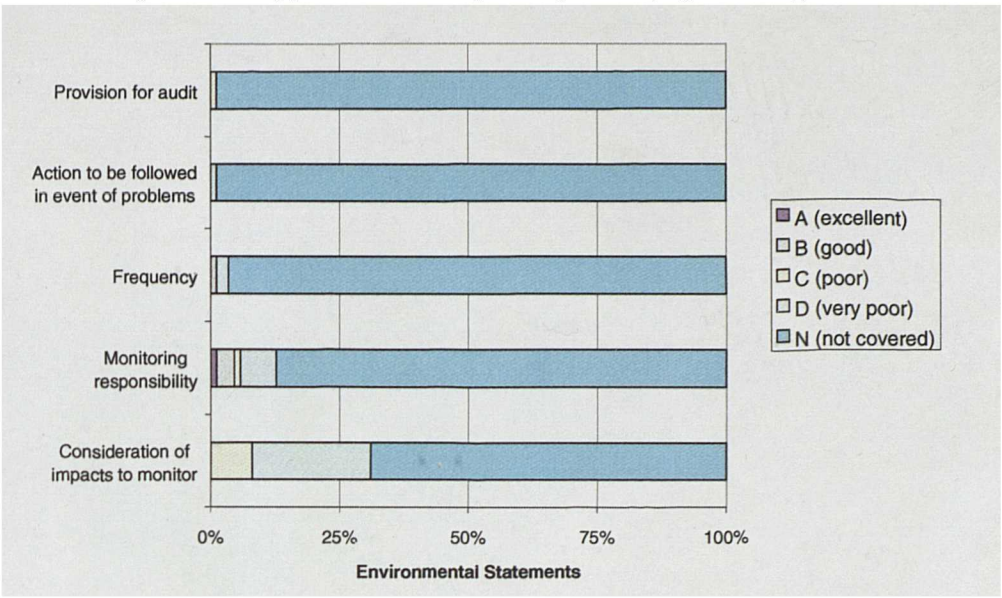


Figure 26. Review results: monitoring.

Review Sub-category Findings

Coverage of these tasks was extremely low despite their critical nature. 31% of environmental statements prescribed the particular features that should be monitored, but only in broad terms. 12% of environmental statements specified which organisation should be responsible for the monitoring operation. Only 3% of the environmental statements reviewed made any mention of the frequency at which monitoring should take place, and only 1% mentioned the response or procedure that should be followed in event of impacts being outside the prescribed acceptable limits. Similarly only 1% of environmental statements made any mention or prescribed a provision for subsequent audit. The Biallaid environmental statement illustrates typical treatment of monitoring and auditing, where the focus of attention is poorly defined, responsibility for action is unclear and frequency is inadequately described.

> *"The owners anticipate that a long term monitoring programme will be initiated in order to monitor the effect of grazing on the vegetation"* (Scottish Woodlands, 1995c).

4.5.4 Communication of Results

4.5.4.1 Presentation

Review Sub-category Elements

While one of the major objectives in carrying out an environmental impact assessment is to provide the decision maker and other readers with additional information, this can be obstructed through poor presentation of material within the environmental statement. The environmental

statement can be seen as a hard copy of the assessment. It also has a major role in sifting information to ensure salient points are easily accessible to the decision maker and other readers. Hence the use of glossaries to explain technical terms, summaries to aid extraction of important points following complex or lengthy sections and the use of quality maps are all techniques which aid understanding and are seen as effective within an environmental statement. Also, due to the fact that an environmental statement may have readers with a wide range of backgrounds and experience of environmental issues it is thought prudent that in addition to identifying the author of the environmental statement, full contact details are provided in order that where necessary readers can contact the author for clarification or further information.

Review Sub-category Findings

An assessment was made of the presentation of the sampled environmental statements. All except for 2% of environmental statements contained the identification of the author although 18% did not contain contact details. The layout or ease of extracting salient information from the whole environmental statement was also graded - 91% of those sampled were categorised as being poor or very poorly presented, with information being difficult to extract or presented in an obtuse manner. Although a useful aid to focusing attention on important points only 13% of sampled environmental statements included summaries after lengthy or complicated sections. As an aid to non-specialists the provision of a glossary can allow quick and easy explanation of obscure technical phrases or jargon - none of the sampled environmental statements included a glossary. All but one of the environmental statements included maps, although many of these, particularly those originating from the late 1980s or early 1990s were of very poor quality. Many maps lacked metadata such as scales and grid references making it difficult to accurately locate the project site on other maps. Also comments by consultees contained within the Woodland Grant Scheme case files highlighted that old maps, lacking woodland which had been planted within the previous 20 years had been used within some environmental statements. This may give inaccurate baseline information when considering land use and landscape issues.

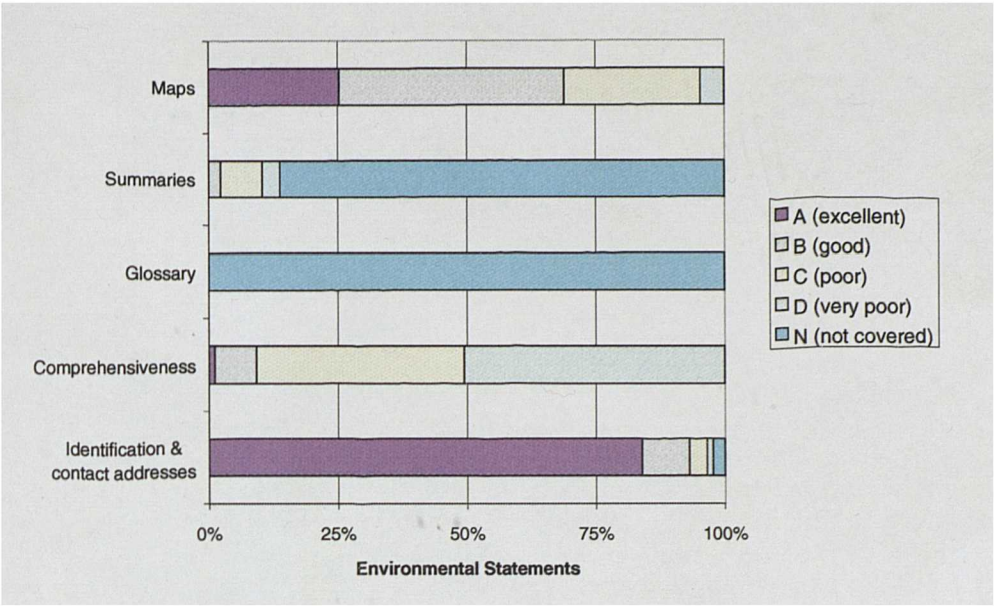


Figure 27. Review results: communication of results – presentation.

4.5.4.2 Balance

Review Sub-category Elements

Due to the fact that the environmental impact assessment and subsequent environmental statement is carried out and prepared under the auspices of the project proponent, while the legislation calls for unbiased assessment there still remains the potential for partisan prejudice. It is therefore essential that the environmental statement maintains an open approach and consistently identifies the difference between the objective reporting of verifiable assessment results or multi-lateral expert opinion, and subjective personal opinion or conjecture of the environmental statement author. The environmental statement should be a neutral account of the environmental impact assessment process, the amount of detail or prominence given to selected impacts should be commensurate with their actual importance or significance. Hence one would expect to find effort concentrated on environmental elements which are known to be fragile or rare, or components of the project which are thought to have the greatest potential for adverse effect. What must be avoided is the conscious or unconscious obfuscation of the significance of assessed impacts. The presentation of many non-significant beneficial impacts should not be allowed to detract from the effects of a significant adverse impact. The environmental statement should not imply that a significant adverse impact is in effect cancelled out by the combined weight of many beneficial impacts whether significant or non-significant. This determination is the role of the decision maker, in assessing whether the ultimate net utility of the project outweighs any disbenefit, and it should not be part of a balanced environmental statement.

Review Sub-category Findings

The environmental statements were also assessed for balance - in terms of the provision of information in an impartial or objective manner, and in terms of the weight or coverage of information for specific items; that is are the most important items dealt with in adequate depth. 41% and 43% of environmental statements were graded in the top two categories for bias and emphasis respectively.

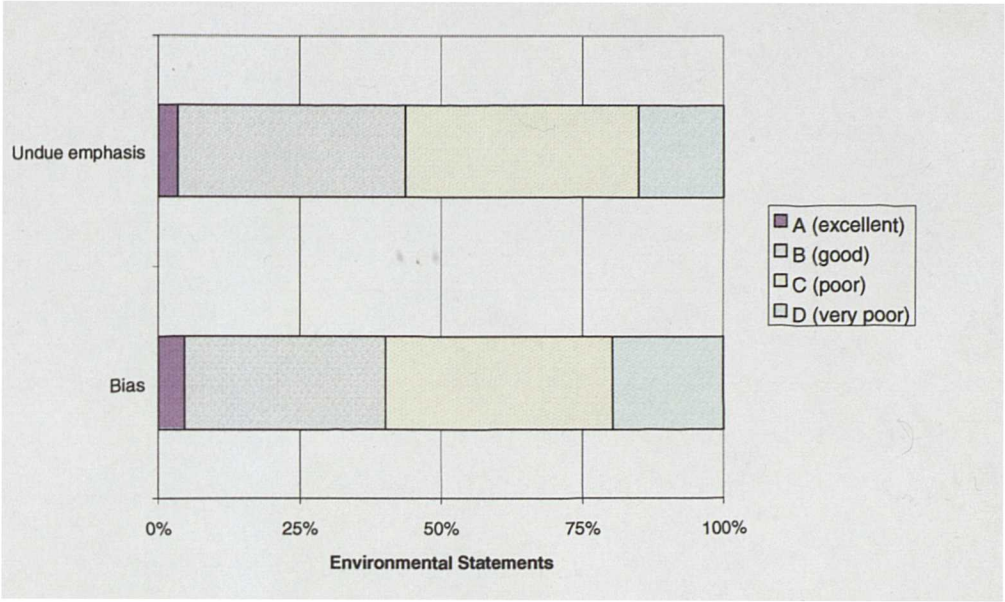


Figure 28. Review results: communication of results – balance.

4.5.4.3 Non-technical Summary

Review Sub-category Elements

The presentation of the non-technical summary was also considered. The non-technical summary is an important part of the environmental statement and can be seen as having two distinct roles. In many cases the readership of the environmental statement may be non-professional. Here the non-technical summary may be the only part of the environmental statement which the reader may have time or inclination to read, the main text being either too lengthy or overly technical to be easily accessed. The non-technical summary can also play a role as an advertisement for the contents of the full environmental statement. It should allow technical readers to quickly identify the outcome of the assessment and decide whether or not there are issues which are of concern or require further attention by reading the appropriate part of the main text. In either case the non-technical summary must be a précis of the full environmental statement, containing concise details of project and site descriptions, baseline data, the assessment of impact significance, any methods of mitigation employed and monitoring programmes proposed. It should however, be written in plain language without the use of obscure technical terms. As within the main text, the non-technical summary must remain within the boundaries of assessment and refrain from straying into the realm of the

decision maker. The function of the non-technical summary is to disseminate the main findings of the assessment in as concise and unambiguous a manner as possible.

Review Sub-category Findings

Only 11% of environmental statements contained a non-technical summary that could be described as an adequate, fair précis of the full assessment. The remainder omitted important points or did not relate these in an accurate manner with the exception of 5% for which no environmental statement was presented. The inclusion of a non-technical summary is a mandatory part of an environmental statement. Its omission should render the environmental statement unacceptable, however, the environmental statements which lacked an non-technical summary had been accepted by the Forestry Commission. Only 7% of non-technical summaries were reviewed as adequately identifying the significant impacts and described their effect on specific target variables. The majority of non-technical summaries were graded as written in an easily understandable form without jargon or complex statistics - however this could be more due to the lack of quantified information rather that a deliberate attempt to prepare the non-technical summary in this manner.

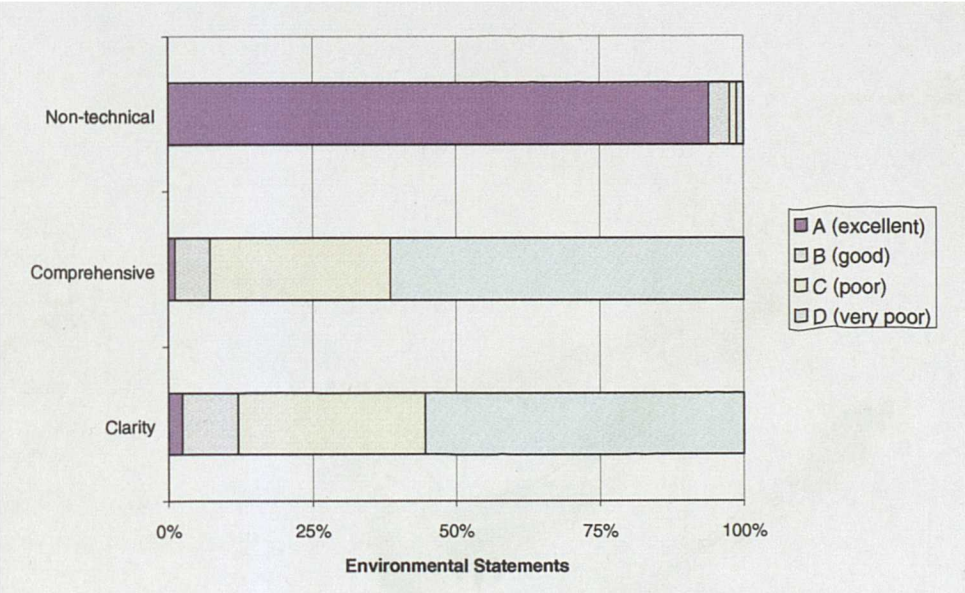


Figure 29. Review results: communication of results – non-technical summary.

4.5.4.4 Identification of Difficulties in Environmental Statement Production

In order to give a full appreciation of the environmental impact assessment and the limitations which can be set on the application of the output, an indication should be given of any difficulties which have been faced during the course of the assessment and preparation of the environmental statement. In addition, as a mechanism for the improvement of environmental impact assessment practice within the sector, the explanation of difficulties encountered within

assessments can assist the planning of research and the preparation of additional guidance by the competent authority for environmental impact assessment practitioners. Difficulties can be split into two distinct types; those arising during data collection including unsuitable survey methods or time constraints, and, those arising during data handling for making predictions and methods of assessing impact significance. A common knowledge based difficulty may be the lack of a proven mechanism to model impact. This may then lead to the inability to accurately assess impact significance. Organisational difficulties can be thought of as problems arising through inappropriate or inadequate assistance from consultees, experts or interested parties. In all cases where difficulties have been encountered their effect on the satiety of the assessment should be recognised, evaluated and disclosed.

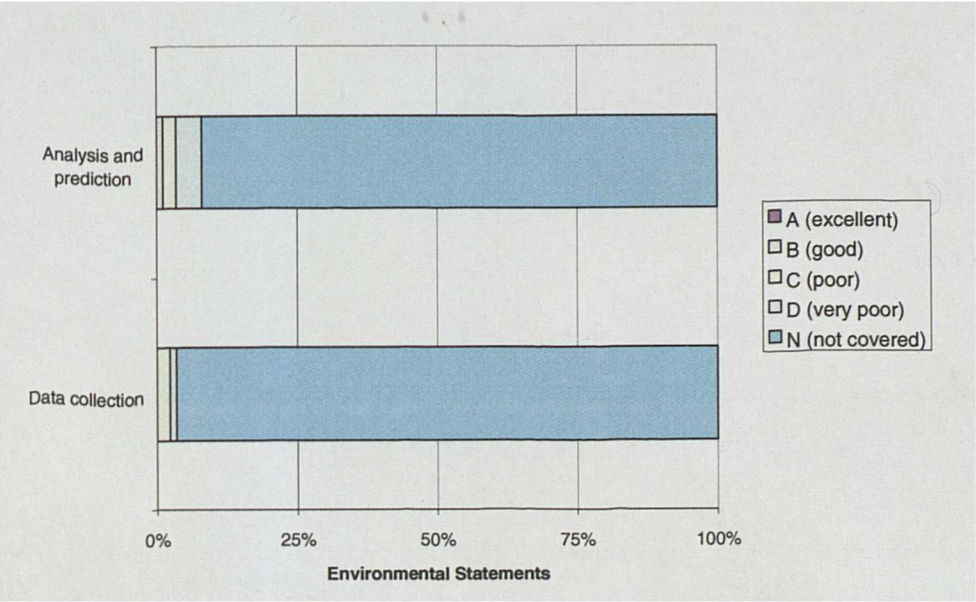


Figure 30. Review results: communication of results – difficulties encountered during assessment.

Very few environmental statements gave any indication of encountering any technical, organisational or knowledge based difficulties. Those that did merely referred to the fact that there had been a problem but did not elaborate as to how this situation arose or the implications in the fullness of the environmental impact assessment or the competency of the data.

4.6 Developing Overall Environmental Statement Review Results

4.6.1 How the Grades are Aggregated

The next step in Lee and Colley's (1992) review process is to combine the preliminary review grades for each of the individually assessed sub-categories to give assessment grades for review categories, and through the hierarchical nature of the review methodology, grades for review areas, and ultimately an overall grade. Lee and Colley's (1992) review process promotes the use of the personal judgement of the reviewer about the relative importance of the individual

sub-categories when aggregating grades and the use of letters for grading prevents simple addition of grading scores. However, within this research the Forestry Commission requested that this process should be conducted in an open and verifiable manner, allowing the reviewer's reasons for awarding an aggregate grade to be openly recorded. In this research a two-stage process was therefore used. In the first, sub-category grades are simply added together and the average computed to give an indicative category grade. The reviewer then makes a personal judgement about the importance of the sub-category grades allowing the indicative category grade to be revised (and the reasons for this noted) in light of review category as a whole and how the sub-categories make this up and a final review category grade established. The individual category grades are then similarly treated to calculate the review area grade, and so on until a final grade is calculated for the environmental statement as a whole. Figure 31 illustrates the hierarchical nature of the review methodology.

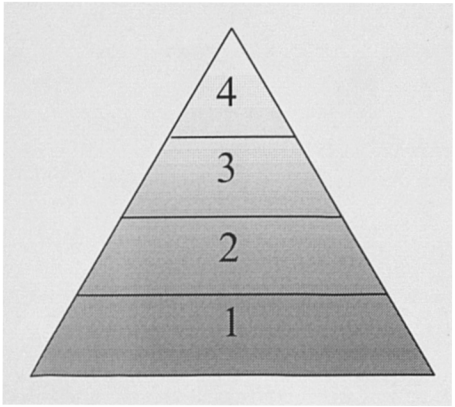


Figure 31. The review methodology hierarchy.

In this process it is necessary to convert the letter grades A,B,C,D,N and N/A into numerical values to allow the calculation of the mean values. The following protocol was adopted, where A = 1, B = 2, C = 3, D = 4, N = 5 and N/A = 0. With this scoring system the sub-categories assessed in the top grade are given the lowest numerical value. The award of an N grade is considered to be the worst scenario as it intimates that the environmental statement has made no attempt to fulfill the requirements of the sub-category. Subsequently, an N grade is given the highest numerical value. Where the environmental statement appropriately declares the provision of information pursuant to the sub-category as not applicable or not required this is awarded a numerical value of zero.

Initial sub-category grades were added together and the aggregate score assigned an indicative category grade, which was then subject to the reviewer's personal judgement and a grade re-assigned for entry into the next level of the hierarchy. The method for calculating aggregate grades for a category with four initial sub-categories is illustrated in Table 9. The mid-points between the aggregate scores for the cardinal grades (AAAA, BBBB, CCCC, DDDD and

NNNN) give the boundaries between the aggregated grades (A,B,C,D).

Table 9. The method used to aggregate review gradings from sub-category to category level.

Sub-category Grades	Numerical value	Aggregate score	→	Category Aggregate score	Aggregate grade
AAAA	1+1+1+1	4	→	0 – 6	A
BBBB	2+2+2+2	8	→	7 – 10	B
CCCC	3+3+3+3	12	→	11 – 14	C
DDDD	4+4+4+4	16	→	15 +	D
NNNN	5+5+5+5	20			

For example sub-category grades AABD, give an indicative aggregate score of 8 (1+1+2+4), which results in an indicative aggregate category grade B. Similarly, three category grades BDN, give an indicative aggregate score of 11 (2+4+5), which results in an indicative aggregate review area grade D. At both stages the indicative aggregate grade is subject to alteration according to the personal judgement of the reviewer.

Through this method the 81 Level 1 sub-categories are aggregated through 17 Level 2 categories and 4 Level 3 review areas to a final Level 4 overall environmental statement grade (Figure 32).

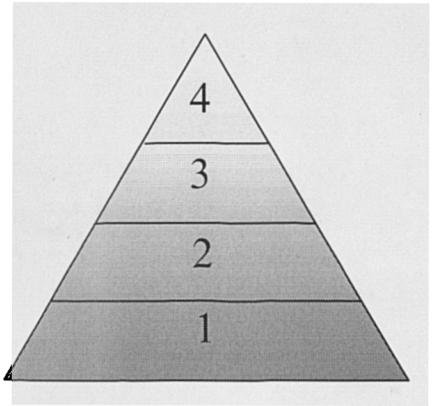


Figure 32. Elements within the review methodology hierarchy.

The aggregation of the review sub-category scores from Level 1 to Level 4 is now discussed. The output from the aggregation of results such as described above should be viewed with caution as during the process of aggregation all review sub-categories are given equal weighting. Therefore during aggregation the relative importance of a review sub-category will be dependent on the number of sub-categories within its review category. The relative effect of a sub-category within a category with many other sub-categories such as in the prediction of impact magnitude will be less than a category with fewer sub-categories such as balance. The aggregation from review category to review area is similarly dependent. Hence the results of the aggregation should be viewed as an indicative measure of the overall quality of the environmental statement rather than an absolute grading.

4.6.2 Review Sub-category to Review Category Aggregation

4.6.2.1 Description of the Project & Local Environment

Only 4 environmental statements achieved an aggregate grade for the description of the project which can be thought of as acceptable (grade A or grade B). None of these were in the top grade. The description of the project site was covered more satisfactorily with 22 environmental statements graded in the top 2 grades. This scoring can be attributed to the fact that many environmental statements failed entirely to cover a number of sub-categories such as residues and emissions, inputs and phases of the project in the project description. Within the description of the project coverage was improved due to the fact that many environmental statements presented information as baseline data which did not actually present specific quantified information on one environmental element (and subsequently gained a low grade for provision of baseline data) but none-the-less presented adequate background information on the proposed site. This said, over two thirds of environmental statements were unsatisfactory (Figure 33).

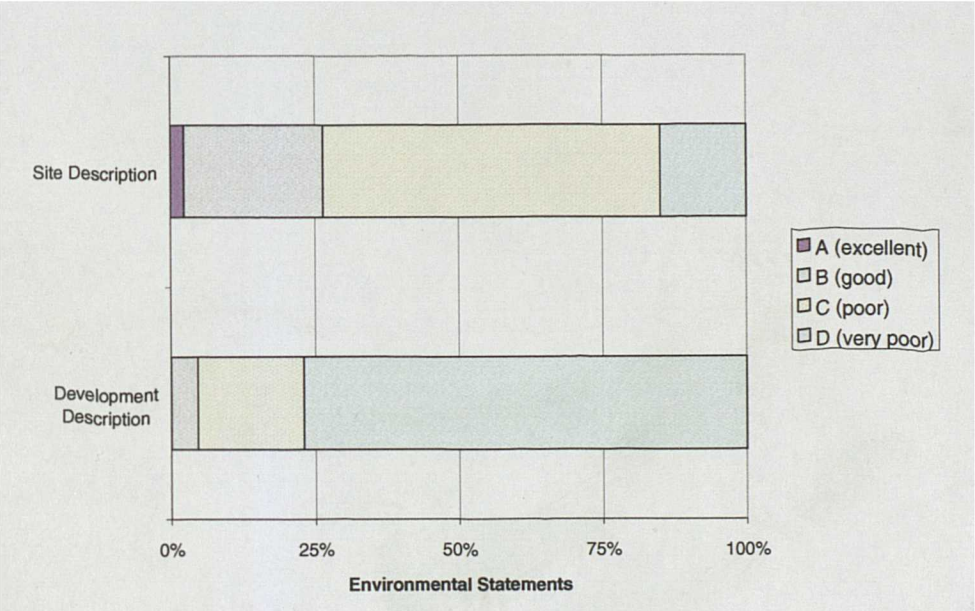


Figure 33. Review category results: description of the project and local environment.

4.6.2.2 Identification & Evaluation of Key Impacts

None of the environmental statements reviewed gained an acceptable grade for scoping. The lack of evidence of an open process through which interested parties were identified, and the presentation of the results of the scoping process means there was no corroboration of the fact that the environmental statement was correctly focused on the key issues. In most cases there was no evidence to suggest that the proponent or the environmental statement author alone did

not decide the terms of reference of the assessment. In a large number of cases there was a failure to state what was considered to be the key issues to be covered in the assessment. The resultant environmental statements were unfocused, non-specific and consequently were afforded low overall gradings. There was an almost complete absence of quantified baseline data throughout the environmental statements reviewed. Quantified data was only found for individual environmental elements in a very limited number of environmental statements. Subsequently only one environmental statement was graded as satisfactory. This recurring failure had implications for the satiety of the resulting environmental statements and therefore their gradings from this review. The lack of quantified baseline data had a limiting effect on the grades that could later be afforded to impact prediction and impact assessment as without suitable baseline data it was very difficult to make a quantified prediction and ultimately an assessment on whether or not an impact should be considered as significant (Figure 34).

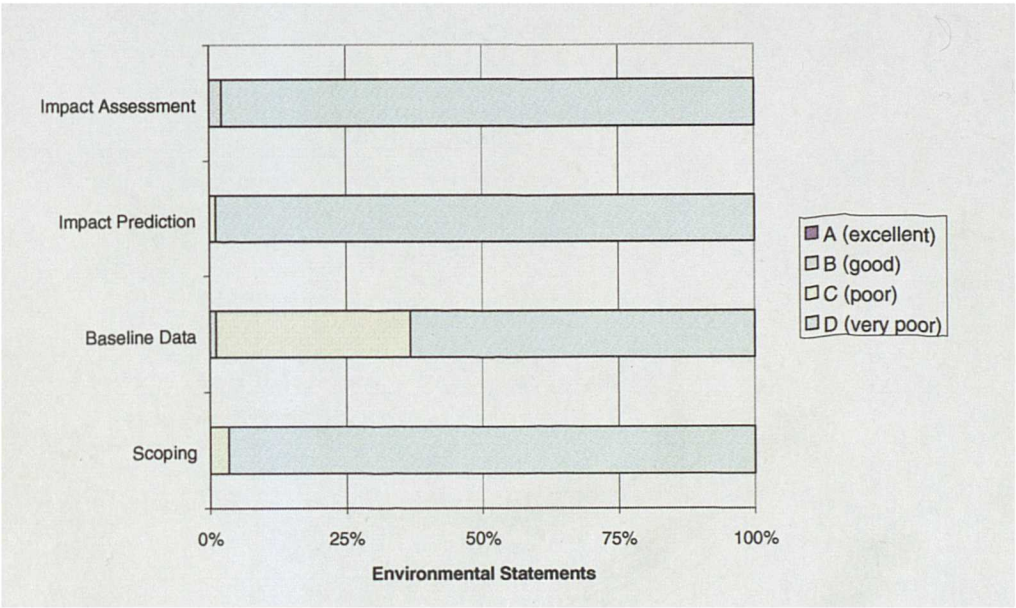


Figure 34. Review category results: identification and evaluation of key impacts.

4.6.2.3 Alternatives and Mitigation

The coverage of alternatives is not a mandatory inclusion in an environmental statement within the forest sector in the UK, and subsequently very few environmental statements made any reference to alternative sites, projects or methods of working. Where information on alternatives was provided this was usually in a very superficial manner, limited to simply naming alternatives that had been considered without giving any insight of the decision path that had been taken in order to reach the proposal under assessment as the optimum selection. Hence all but one environmental statement were afforded an aggregate grade below an acceptable level. The coverage of mitigation sub-categories was hampered by the failings

already discussed on the provision of quantified baseline data. Without quantified data it was very difficult for the environmental statements to present any meaningful discussion of potential methods of mitigation, their levels of efficacy and levels of residual impact. None of the environmental statements attained an acceptable aggregate category grade. The inclusion of monitoring proposals in an environmental statement is not mandatory and therefore very few environmental statements made any mention of monitoring the effects of projects. Where details were included these were of little depth and yielded little information. Subsequently all but one environmental statement scored an aggregate D grade (Figure 35).

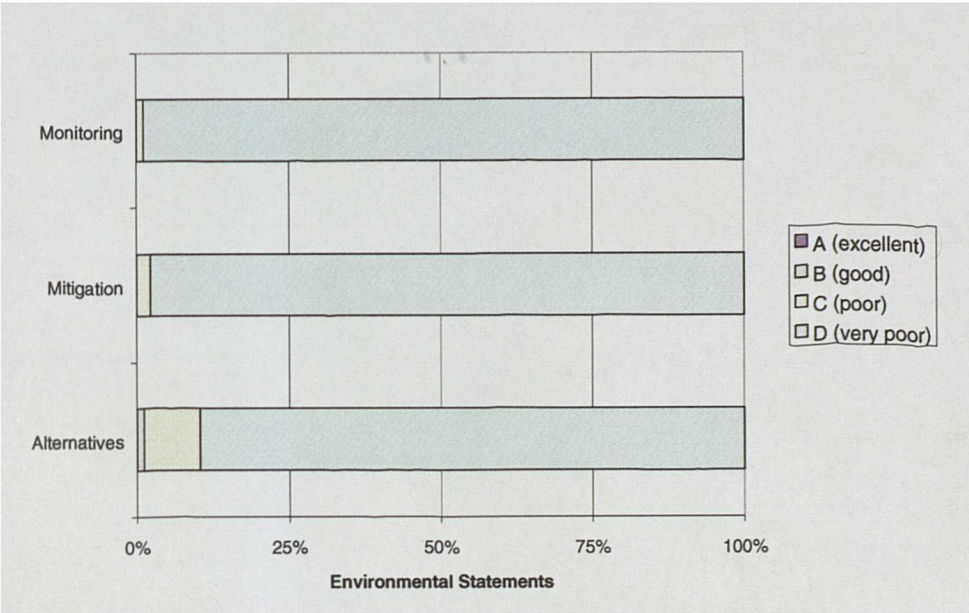


Figure 35. Review category results: alternatives, monitoring and mitigation.

4.6.2.4 Communication of Results

While many of the environmental statements reviewed were glossy documents, using high quality colour graphics and professional binding, a large number failed to use simple techniques such as glossaries or summaries to aid comprehension. The lack of page or paragraph numbers and adequate citation of information sources made cross-referencing difficult in many cases. Thus only 2 environmental statements achieved an aggregate category grade which was acceptable. The majority of environmental statements achieved a B or C aggregate category grade for balance as most environmental statements displayed some level of partisanship or unnecessary over-emphasis on certain elements in the assessment. Only 9 environmental statements achieved an acceptable grade for provision of a non-technical summary. While all but 2 environmental statements included a non-technical summary, in the majority of cases this fell far short of providing an accurate précis of the entire environmental statement. Very few environmental statements made any reference to difficulties or problems experienced in

completing the assessment and subsequently all but one environmental statement attained an aggregate category D grade (Figure 36).

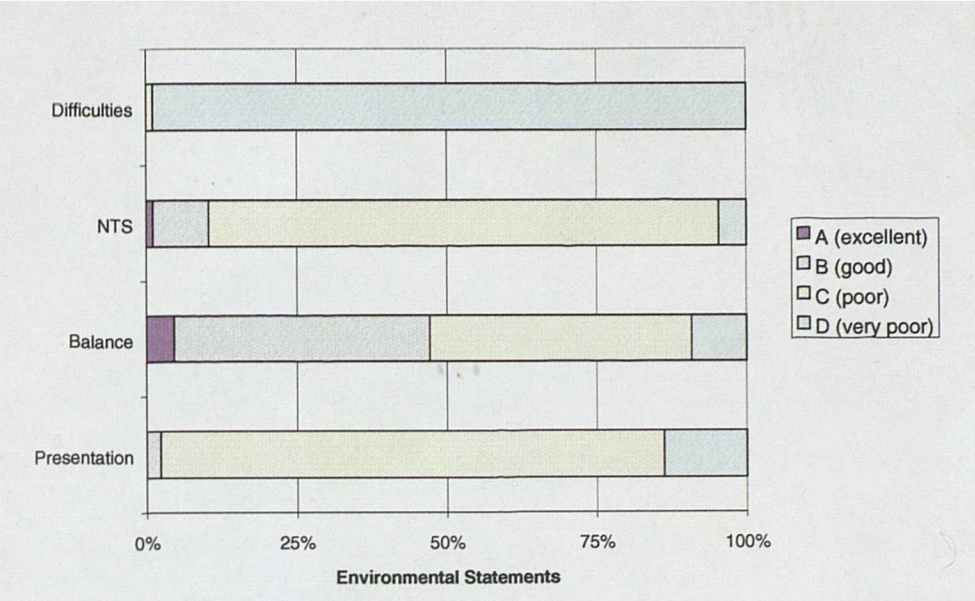


Figure 36. Review category results: communication of results.

4.6.3 Review Category to Review Area Aggregation

The aggregation of the above results from Level 3 to Level 2 is illustrated in Fig 37. No environmental statement attained an A-grading for any review area in Level 2. Only 13 environmental statements achieved a B-grading for the description of the proposal and site. Only one environmental statement achieved a B-grading for the identification and assessment of impacts, and one achieved a B-grading for communication.

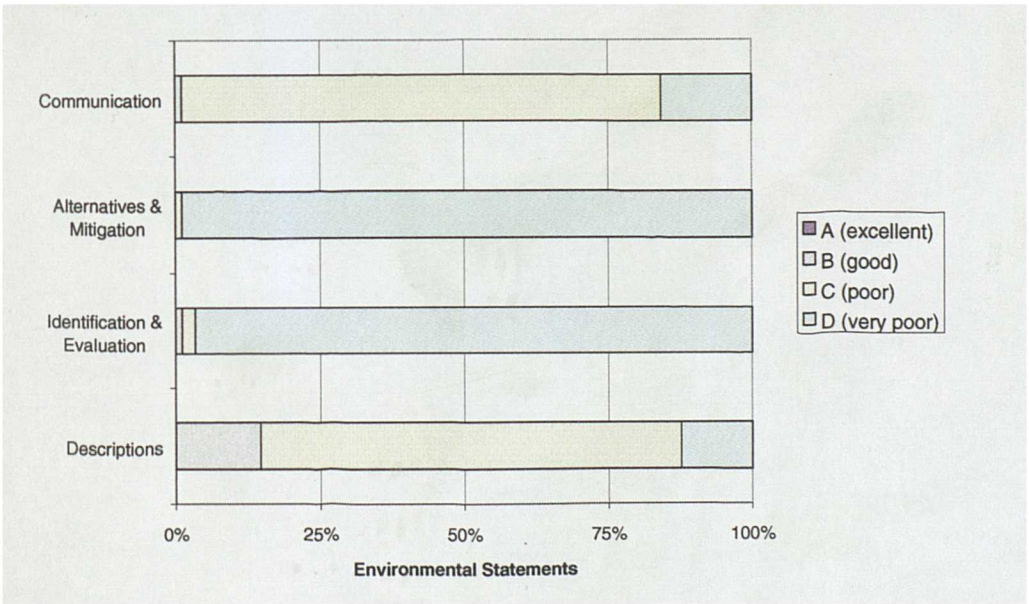


Figure 37. Review area results.

4.6.4 Review Area to Overall Environmental Statement Grade Aggregation

Completing the final step of grade aggregation to Level 4 (Figure 38) results in only one environmental statement achieving an acceptable score and this is at B grade. The majority of environmental statements (69) attained an aggregate Level 4 C grade, and 19 environmental statements were awarded the lowest D grade.

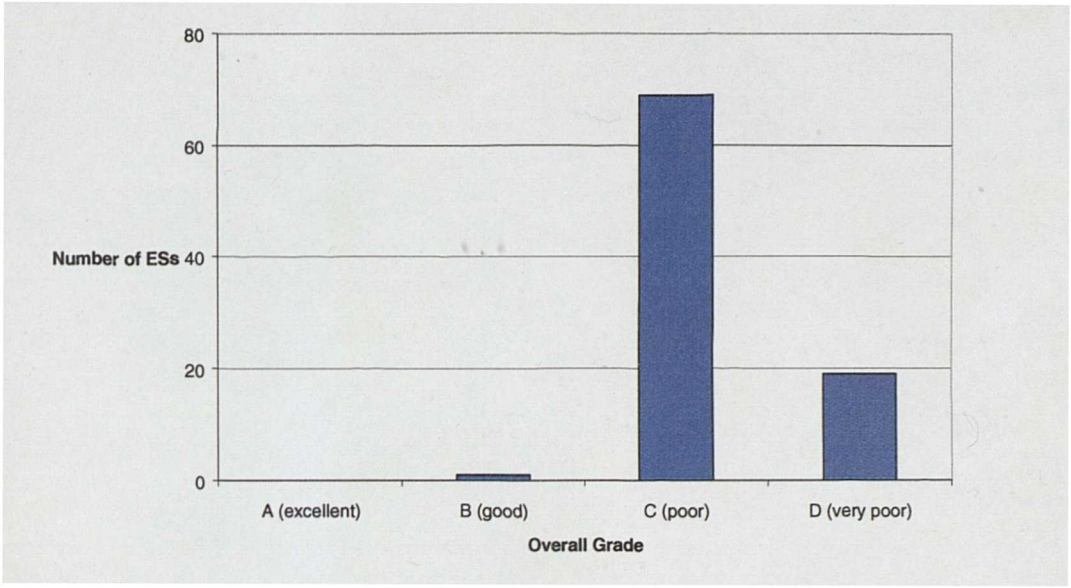


Figure 38. Overall environmental statement grades.

4.7 The Identification of Environmental Statement Authors

One of the criticisms which have been levelled at environmental impact assessment across all sectors is the fact that the assessment is carried out at the behest of the proponent. The fact that the proponent pays for and therefore may control to a certain extent the content of the assessment is seen as an area for potential conflict, where the impartiality of the assessment could be questioned. From the 89 environmental statements reviewed it was found that 11 were prepared 'in-house' by estate managers, factors and in one case, the proprietor. Environmental consultants from a variety of backgrounds, but essentially non-forestry completed 18 environmental statements. The majority of environmental statements, 60, were prepared by personnel from forestry management companies. Figure 39 illustrates this distribution.

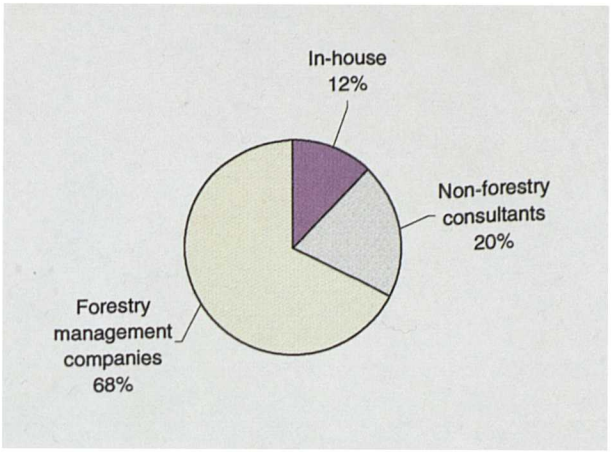


Figure 39. Categories of environmental statement authors.

Turning to the experience of people carrying out environmental impact assessments 27 (30%) of environmental statements were prepared by authors who have carried out only one assessment. A further 18 (20%) had been prepared by authors who have carried out between 2 and 6 assessments. The remaining 44 (49%) of environmental statements had been prepared by four authors who had completed 7 or more assessments (within this survey, the author can be considered to be an individual or an organisation).

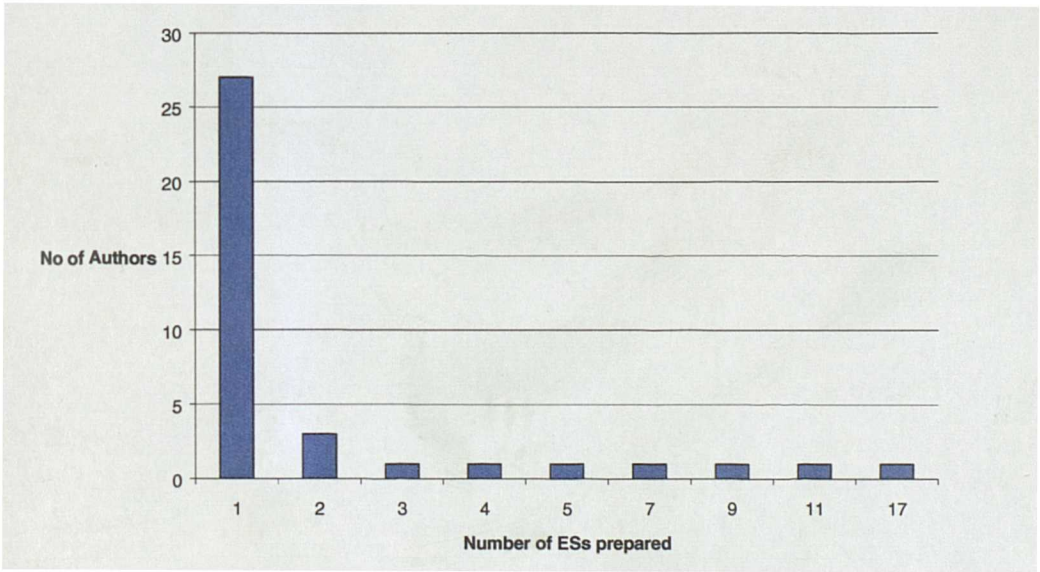


Figure 40. The number of environmental statements prepared by individual authors.

In a number of cases a management company was credited as being the author of the environmental statement rather than an individual person. The three major forest management companies Scottish Woodlands, TEF and Fountain Forestry accounted for 38% of the number of environmental statements prepared with Scottish Woodlands, having carried out (with the

assistance of a non-forestry consultant in 11 cases) 17 assessments, approximately 20% of the sample. An examination of the overall environmental statement grades and the number of environmental statements an author has produced, shows that there is little difference in relation to the experience of the environmental statement author. Of the 45 environmental statemens prepared by authors who have prepared between one and five environmental statements 36 are graded C and 9 graded D. Of the 44 environmental statemens prepared by authors who have prepared more than five environmental statements, one is graded B, 33 are graded C and 10 are graded D.

4.8 Chapter Summary

Despite the availability of widely accepted review methodologies and the acknowledgement of the benefits of including a review stage in the environmental impact assessment process there is no statutory requirement for environmental statement review in the UK. Within the forest sector the Forestry Commission has been slow to initiate the review of environmental statements and no systematic methodology has been developed by the Forestry Commission, however since 1997 an increasing number of environmental statements are being subject to third party review. Forestry Commission internal direction on the requirements of the quality of environmental statements is sparse and the publication of Forestry Commission guidance for the forest sector has been repeatedly delayed.

The Environmental Statement Review Package is widely accepted as the premier methodology for environmental statement review and was easily modified for use in the forest sector. The results from the review of environmental statements carried out in 1996 (Gray, 1996) show remarkable similarities with those carried out for this research and highlight the overall poor or very poor quality of environmental statements within the forest sector. Only one environmental statement achieved an overall grade which could be considered at an acceptable level, with 69 environmental statements achieving the second lowest and 19 environmental statements achieving the lowest quality grading. The review highlighted few sub-category scores in the top two grades and identified consistent and serious deficiencies within the assessment of individual impacts. Key issues resulting in the overall low grades were:

- Scoping absent or ineffective;
- Lack of quantified baseline data for key issues;
- Missing or inappropriate predictions of impact;
- Missing or inappropriate determination of impact significance;
- Lack of provision of post-initiation monitoring;
- Inadequately described mitigation methods and mitigation efficacy;

- Bias in support of the proposal.

The fundamental flaw within many environmental statements was the failure to adequately scope the assessment. This failure caused problems in subsequent elements of the assessment due to the fact that the key issues had not been adequately identified leading to unfocused treatment of potential impacts. The majority of the sample of environmental statements were prepared by personnel from one of the major forest management companies. While over 70% of environmental statement authors had carried out only one assessment, more than half of all environmental statements had been prepared by one of four authors who have completed between 7 and 17 environmental impact assessments in the forest sector.

The review also noted that very few environmental statements found that significant impacts would be likely as a result of project implementation following assessment. The poor standard of assessment typified by the lack of baseline data, adequate impact prediction and determination of impact significance was identified as casting doubt on the authority of the environmental statement's findings. The imprecise use of the term 'significant impact' within the environmental statements made it impossible in many cases to judge whether or not an assessment had actually identified an impact as being significant. While many environmental statements contained the term 'significant impact' in the text it is estimated that less than 10% of environmental statements has consciously determined that impacts resulting from their particular project were significant. However, it should be noted that even these determinations of impact significance were not the result of an open assessment process, rather a pronouncement made by the environmental statement author which was not supported by any evidence. This failure to follow even basic assessment protocol was a very common flaw throughout the environmental statements reviewed.

CHAPTER 5 THE ASSESSMENT PROCESS WITHIN THE FOREST SECTOR

5.1Introduction

In Chapter 4 it was noted that the overall quality of forest sector environmental impact assessments was generally poor, with very few environmental statements providing a reliable assessment of potential impacts. In Chapter 3 it was seen that the level of environmental impact assessment activity was high in the forest sector in comparison with other sectors in the UK accounting for approximately 3% of all UK assessments and 18% of Scottish assessments. An indication of the economic activity and hence activity within the different sectors is their percentage of Gross Domestic Product (GDP). With only 1.4% of Scottish GDP and 1% of UK GDP in forest, agriculture and fisheries sectors combined (Scottish Executive, 2000) the forest sector in Scotland has a high number of assessments relative to its level of economic activity. However despite this high number of assessments very few environmental statements identified significant impacts which would arise from project implementation. In addition, out of 101 environmental impact assessments to have completed the process only one had been rejected following assessment. Investigation into the quality of the assessment of impacts will be carried out in Chapter 6. This chapter seeks to explore possible reasons for the high numbers of environmental impact assessments called but low incidence of significant impacts in the forest sector through two main topics; the examination of the Forestry Commission screening process, and the gathering of information on key actors in the process.

The efficacy of the Forestry Commission screening process was examined through the development of a screening protocol which was then applied by Forestry Commission Conservancy staff and a second group of students with basic knowledge of environmental impact assessment. The screening protocol was used to screen four actual Woodland Grant Scheme applications. The results of the two groups were then compared.

A series of three questionnaires was used to collect information from the three key actors in the environmental impact assessment process, Forestry Commission staff, environmental statement authors and consultees. Details on experience of the assessment process, involvement in screening and scoping, use of recognised methodologies and tools and perceptions on the value of the process to the forest sector and the role of the Forestry Commission were obtained.

5.2Screening in the Forest Sector

5.2.1 The Role of Screening

The completion of the review of the forest sector environmental statements within this research

gave results with similarities to the 20% sample reviewed in 1996 (Gray, 1996, Gray and Edwards-Jones, 1999). As discussed in detail in section 2.7 screening is a key step in the administration of the environmental impact assessment process. The role of screening is to identify from all development projects those considered to contain potentially significant adverse impacts (DETR, 1998b). The screening process should quickly separate projects with low environmental impact and focus attention on those with the most important issues. If the process of screening is not adequately carried out the usefulness of the whole environmental impact assessment process is jeopardised (Jain *et al.*, 1977). If screening is inefficiently carried out and too many projects are called for environmental impact assessment this runs the risk of subjecting projects which actually present negligible impact on the environment to the additional cost and time implications of the assessment process. Within the forest sector the fact is that over 20% of projects are withdrawn from the Woodland Grant Scheme process on the decision that the project requires an environmental impact assessment. A screening process which does not focus attention on key projects efficiently may act as a barrier to projects which would result in little or no impact on the environment and would be implemented but for the imposition of the requirement of assessment and the proponent's unwillingness or inability to fund the process. The antithesis of this, a screening process which is overly lax, results in projects being allowed to proceed without environmental impact assessment which may well result in potentially significant adverse impacts. The role of environmental impact assessment as a means of environmental protection in this case is therefore limited.

Both situations result in a breakdown in the faith of those parties involved in the process of the usefulness of environmental impact assessment. Both scenarios result in the failure of environmental impact assessment as an effective means of environmental protection, although through different processes. In the former situation, proponents will see environmental impact assessment as an unnecessary burden on development with too many environmental impact assessments being called where they are not strictly necessary. In addition consultees are requested to become involved in assessments where the investigation of potential impacts and therefore their input is unnecessary. It may be that it is this very scenario which results in continuing low quality environmental impact assessment within the forest sector in Great Britain. Actors do not feel there is any real case to answer and therefore the standard of assessment is reduced. There is no drive from any party to expend resources on a process that is generally considered will ultimately result in a non-significant finding. With over 20% of all Scottish environmental impact assessment activity the Forestry Commission is one of the most active competent authorities. The potential effect of poor screening resulting in too many environmental impact assessments is that insufficient attention will be paid to individual assessments allowing the standard of assessment to fall. In these cases where assessment is

unnecessary this in itself is not a problem, the important point is that once the standard of assessment has been dropped it is later difficult to raise. Projects that are subsequently correctly screened for assessment are then assessed at the same low standard. A project may have been correctly screened, however through complacency the assessment of individual impacts is insufficiently robust.

In the situation, where too few environmental impact assessments are called for, actors other than the proponent may feel that they are unable to contribute to the discussion on projects which they consider to have potentially significant adverse impacts. Projects may be going ahead which result in levels of impact of such significance that the project would have been rejected outright or, projects may have impacts which could have been successfully and perhaps simply reduced to a level of non-significance by the introduction of mitigatory measures early in the design process. The importance of screening can therefore be seen. If environmental impact assessment is to be accepted by all actors as a useful process its application should be targeted towards those projects with potentially significant adverse impacts. Projects that are considered to have potential impacts but of a less serious nature must not be caught up in the assessment process as this has two undesirable effects which must be avoided. Proponents and consultees are subjected unnecessarily to the additional costs of assessment, and, where actors realise projects are unnecessarily being assessed the accepted standard of assessment is driven down.

5.2.2 Five Screening Scenarios

Considering the high numbers of environmental impact assessments called and the paucity of assessment findings where impact was considered to be significant the obvious question is whether or not screening is sufficiently robust within the forest sector. From the work in 1996 (Gray, 1996) and the additional results reported in Chapter 4 three possible hypotheses emerged (summarised in Table 10):

1. The Forestry Commission is correctly identifying projects with potentially significant adverse impacts, the resultant environmental impact assessments are correctly assessing these potential impacts as non-significant;
2. The Forestry Commission is correctly identifying projects with potentially significant adverse impacts, the resultant environmental impact assessments are incorrectly assessing these potential impacts as non-significant;
3. The Forestry Commission is incorrectly identifying projects with potentially significant adverse impacts, the resultant environmental impact assessments are correctly assessing these potential impacts as non-significant.

In theory a fourth situation is possible and should be considered in order to allow the full range

of possible situations to be discussed:

4. The Forestry Commission is incorrectly identifying projects with potentially significant adverse impacts, the resultant environmental impact assessments are incorrectly assessing these potential impacts as non-significant.

A fifth alternative was raised by Dr Syd House of the Forestry Commission during discussion of the 1996 review results.

5 The Forestry Commission is correctly identifying projects with potentially significant adverse impacts, the resultant environmental impact assessments are correctly assessing these potential impacts as non-significant following mitigation measures incorporated into the project following notice that an environmental impact assessment is required and resulting from discussion with interested consultees.

Table 10. The five screening and assessment outcome hypotheses.

Hypothesis	Performance of Forestry Commission	Performance of EIAs
1	Screening correctly	Assessing correctly
2	Screening correctly	Assessing incorrectly
3	Screening incorrectly	Assessing correctly
4	Screening incorrectly	Assessing incorrectly
5	Screening correctly	Assessing correctly amended project

5.2.3 Examination of the Screening Scenarios

5.2.3.1 The Iterative Environmental Impact Assessment

In the fifth situation the Forestry Commission has correctly identified a project having potentially significant adverse impacts. During the early stages of the resulting assessment, discussion between the proponent and interested consultees brings about alterations being made to the project design. Dr House's argument then follows that the potentially significant impacts are removed or mitigated and the subsequent environmental impact assessment correctly assesses these potential impacts as non-significant. This in fact is the archetypal set of circumstances one would expect within the project cycle, with changes to project design successfully mitigating impacts below levels of significance. However, in the classic environmental impact assessment this process of mitigation occurs in a verifiable manner following calibration of the original level of impact. In the assessments reviewed for this research the project description presented in the environmental statement may not be that of the original project but an amended project design resulting from discussion between the actors. This pre-environmental impact assessment mitigated project is effectively endorsed by

consultees; the ensuing assessment is a pointless exercise as there quite rightly are no potentially significant adverse impacts. In this case the Forestry Commission is incorrectly handling the screening of projects. Both the Forestry Commission and proponents are failing to make best use of the opportunity to improve project design at the earliest possible stage. The Forestry Commission should use the scoping process as an extension to the screening process to ascertain whether or not the project can be improved by simple design changes to reduce potential impacts.

If this is the case, the Forestry Commission should be re-screening the amended project for the requirement of assessment rather than allowing the environmental impact assessment process to continue merely because once started the process is believed to be required to result in the publication of an environmental statement regardless of developments. This is a failure to understand the iterative nature of environmental impact assessment and best practice on the part of the Forestry Commission. Similarly if proponents fully understood the environmental impact assessment process this chain of events would not be allowed to continue. Proponents accepting the benefits of using environmental impact assessment as a project-planning tool, rather than just a planning hurdle would use early consultation to avoid potential impacts at the first stages of project inception. This would avoid the initiation of the environmental impact assessment process in the first place, however the reticence of some consultees to become involved in early discussion is acknowledged. There are examples of consultees refusing to discuss projects before a firm Woodland Grant Scheme application had been submitted and the consultees officially approached by the Forestry Commission. In addition the Woodland Grant Scheme case files revealed a number of cases where consultees would reserve comment on project or assessment until they received the completed environmental statement. This is obviously wasteful of resources; the early interjection of additional information may have been sufficient to remove the need for assessment thereby removing the cost of assessment from the proponent. The other actors within the process are also freed from unnecessary involvement in the often time consuming environmental impact assessment process.

However, the number of cases in which the above process could be identified was very low. From the Woodland Grant Scheme files it was possible to compare the initial Woodland Grant Scheme application with the project design included in the environmental statement. None of the accompanying Woodland Grant Scheme case files made specific reference to the fact that the project design had been amended to reduce potential impacts prior to assessment. In those cases where the initial Woodland Grant Scheme proposals and those included in the environmental statement were different, the changes did not appreciably alter those elements of the project thought to give rise to potential adverse impact. It is therefore not considered a valid

argument that the fifth situation gives rise to the low incidence of impacts determined as significant.

5.2.3.2 The Forestry Commission Screens Correctly

The other two situations (1 and 2) in which the Forestry Commission correctly identifies projects with potentially significant adverse impacts are considered next. The results of the review of forest sector environmental statements in Chapter 4, would suggest that the standard of assessment is below that which could be considered to be adequate. Consequently the possibility exists that individual assessments may result in findings of non-significance where in reality impacts would be of a significant nature. One can therefore infer that while the Forestry Commission may correctly identify projects with potentially significant adverse impacts, the resultant assessments are not of sufficient quality to rely on their ability to unequivocally assess potential impacts. This alternative gains credence when one considers the results of the analysis of the environmental statements as given in Section 3.5.4. Here it is evident that the majority of proposals called for assessment had their area of afforestation reduced by greater than 10%. While the proposals contained in the Woodland Grant Scheme contracts were different to that initially proposed, and assessed, the point at which this alteration was made to the original project as proposed in the initial application and the subsequent environmental statement is unclear. The methods of mitigation provided in these environmental statements did not include reduction of the area afforested as seen in Section 3.5.4. In these cases it would appear that the Forestry Commission screens the project as having potentially significant adverse impacts. The environmental impact assessment is carried out on this proposal which suggests that there are no significant impacts. The subsequent environmental statement is accepted by the Forestry Commission, but then the project design is amended (usually including a reduction in the size of the afforestation scheme) before the Woodland Grant Scheme contract is prepared and agreed. It would appear that despite the Forestry Commission accepting the environmental statement including the determination of impacts as non-significant, the proposals are not acceptable to the Forestry Commission in their original form and require some form of mitigatory measures, typically material changes to the area of afforestation. The process of assessment is somewhat circumvented as the environmental impact assessment is called, prepared, accepted as a useful contribution to the decision making process and then ignored as changes (sometimes radical) are made to the afforestation proposals.

5.2.3.3 The Forestry Commission Screens Incorrectly

Turning to the remaining situations (3 and 4), that the environmental statements are of adequate quality, having found that very few cases determined that significant impacts would result from

project initiation it would be reasonable to assume that the Forestry Commission may be calling for environmental impact assessments in cases where assessment was not actually required. This would be against Government policy that environmental impact assessment should not subject development projects to the additional costs of assessment unnecessarily. However, bearing in mind the results of the review of environmental statements, the quality of assessment within forest sector environmental impact assessments is extremely low. The lack of adequate scoping raises the question of whether or not the assessments ever effectively identify the really important issues. One conclusion could be that the findings of non-significance are brought about by the fact that the environmental statements fail at the outset to focus on the potential adverse impacts. If this is the case, non-significant impacts may be being correctly assessed while the more crucial potentially significant impacts are omitted from assessment or assessed in a very superficial way.

5.2.3.4 Conclusions on the Efficacy of Forestry Commission Screening

From the review of forest sector environmental statements it can be seen that it is not appropriate to assume that the environmental impact assessments carried out are of sufficient quality to reliably and accurately assess the significance of potential impacts. It maybe therefore that either the Forestry Commission is correctly screening projects with potentially significant adverse impacts or their screening process is in some manner flawed. The quality of screening can be thought of as having two provisions, identifying projects with potentially significant adverse impacts and therefore including them in the environmental impact assessment process, and identifying projects without potentially significant adverse impacts and excluding them from the process. To correctly screen projects both of these elements must be attained. A screening approach which correctly identifies projects with potentially significant adverse impacts but fails to exclude projects without impacts may certainly ensure the most potentially damaging projects are assessed, but this is at the cost of unnecessarily burdening perfectly acceptable projects with the additional expense associated with environmental impact assessment. More worrying is a screening process which neither accurately identifies potentially damaging projects for inclusion nor excludes benign projects from assessment. This is the worst case scenario in which environmental impact assessment fails to perform as a method of environmental protection and places undue burden on development proposals.

One is therefore left with situations 1 and 2 that environmental impact assessments are not adequately assessing impacts and that the Forestry Commission may or may not be adequately screening projects. However given the examples of assessments being carried out despite consultees' endorsement of the projects the latter is considered to be more likely. The most direct manner to ascertain which of these is correct would be to conduct an audit of a sample of

assessments together with a sample of projects not subject to assessment. By investigating 'regular' Woodland Grant Scheme projects one could identify if significant adverse impacts were occurring. However this would be reliant on adequate baseline data. Considering the rarity of baseline data in the assessed cases the likelihood of adequate baseline data for non-assessed cases is very low. To pursue this method surveys would have to be initiated prior to project implementation.

By comparing predictions from assessments and actual outcomes it would however determine the extent to which the Forestry Commission's screening process had accurately identified projects with potentially significant adverse impacts. In addition it would further investigate the legitimacy of environmental statement findings of significance by assessing the actual effect of the project. However this investigation relies on the provision of adequate information within the environmental statements upon which to base a credible audit protocol. In common with the work of Lee & Colley (1992), the findings of the vast majority of environmental statements are not auditable due to a lack of adequate baseline data, open assessment methods and clear determination of significance. Without the capacity to audit full cases itis difficult to audit the effectiveness of the Forestry Commission screening process by this method, although the audit of the assessment of individual potential impacts could still be carried out. This truncated audit is described in Chapter 6.

In an effort to improve the investigation of the Forestry Commission's screening process in the absence of the ability to carry out full audits, a series of case studies were prepared which would be screened by Forestry Commission staff for assessment. Further information on the screening process and also the level of understanding of those involved in the assessment process within the forest sector, was obtained through the preparation of a series of three questionnaires sent to Forestry Commission conservancy staff, consultees and environmental impact assessment practitioners within the forest sector.

5.3 Examination of the Forestry Commission Screening Process

5.3.1 Methodology

This investigation sought to consider whether or not the Forestry Commission screening process identifies projects containing potentially significant adverse impacts and marks these projects for assessment while allowing projects which do not contain potentially significant adverse impacts to be handled by the normal non-assessment (Woodland Grant Scheme) process. As noted in Chapter 3, the Forestry Commission does not currently use any formalised screening methodology. There is no common method of screening, or guidance provided to staff on how screening should take place. There is therefore no existing systematic process which could be

audited at either conservancy, national or Great Britain level. This investigation therefore had to devise a screening protocol and then have this used under controlled conditions where the results could be analysed. Permission was obtained from the Forestry Commission to run a trial of the screening protocol using conservancy staff. Due to the limited time which could be sanctioned for this effort it was agreed that the trial should make as little time demand of conservancy staff as possible, this was further described as approximately one hour duration. The screening exercise was therefore limited to four case studies which individual conservancy staff were to screen. In simple terms, the investigation of the Forestry Commission screening process could be carried out by re-screening two case studies which had been called for assessment and two cases which were not called for an environmental impact assessment and proceeded through the normal Woodland Grant Scheme process.

5.3.2 Selection of Case Studies

During the course of the review of forest sector environmental statements a number of cases were noted as having issues on which consultees made explicit their concerns of potentially significant adverse impacts associated with the project. These concerns were repeated following submission of the environmental statement and during the ensuing Woodland Grant Scheme consultation process. The review found that for all but a very few individual elements within individual environmental statements, although a finding of non-significance was made the standard of assessment was below a quality thought to be acceptable raising doubts over the legitimacy of the assessment findings. In addition a number of this type of project were those that were amended post-assessment but prior to issue of a Woodland Grant Scheme contract. Hence, using the precautionary principle it would be reasonable to assume in these cases, utilising the guidance of the consultees, the potential for adverse impact remains. These cases have been taken to constitute 'true positive' screening decisions.

During the review of forest sector environmental statements, it was noted that in the majority of cases no significant adverse impacts were identified. Where the Woodland Grant Scheme case files were available for inspection it was noted that in several cases at the point in the assessment when consultees are initially contacted (when scoping should have been carried out), all consultees submitted comments to the Forestry Commission stating that with regard to their specialist field they had no concerns about potential significant adverse impacts associated with the project. Following submission of the environmental statement during the normal consultation period the same consultees again confirmed that in their view the project gave rise to no concerns about potential impact and saw no reason to object to the proposal. In a limited number of cases the general consensus of consultees was to support the project. Despite such endorsement of generally benign projects (such as expansion of existing woodland through

natural regeneration on sites with no designatory status or protected species), projects were still submitted to the environmental impact assessment process. If all consultees agreed that there is in effect no case to answer, one must question why the Forestry Commission continued to insist on an assessment. These cases suggest that the screening process had failed to screen out projects which pose no threat to the environment and should not have been subjected to environmental impact assessment. This has been taken to be a 'false positive' screening decision.

Following discussion with Forestry Commission staff it became clear that there were instances when cases may have been processed through the normal Woodland Grant Scheme procedure and not called for assessment, but may well have included potentially significant adverse impacts. With improved experience these cases were generally considered among local Forestry Commission staff to require assessment if the same project were to be re-submitted. However due to the fact no environmental monitoring or auditing has been carried out on these Woodland Grant Scheme projects it is impossible to verify the claims, as the baseline data does not exist to allow assessment. It was therefore decided to have two categories of Woodland Grant Scheme cases: 'true negative' cases where the need for environmental impact assessment was correctly rejected and 'false negative' cases where the case files presented sufficient information to ascertain that the screening decision may be incorrect in allowing the project to proceed without environmental impact assessment.

During the review of forest sector environmental statements four cases of false positive screening and seven cases of true positive screening decision were identified. From these one of each type was randomly selected for inclusion in the exercise. The Forestry Commission granted access to Woodland Grant Scheme case files for non-environmental impact assessment Woodland Grant Scheme projects from Strathclyde conservancy.

Table 11. The four case study screening outcomes and identification of the actual screening decisions.

Project	Description	Actual screening decision
A	Project called for EIA, no significant adverse impacts	False positive
B	Project called for EIA, potentially significant adverse impacts	True positive
C	Project not called for EIA, no significant adverse impacts	True negative
D	Project not called for EIA, potentially significant adverse impacts	False negative

Two cases each of false negative and true negative type were identified and one of each type randomly selected for inclusion in the exercise. For each case study information was collated on the project design, preliminary site description and consultees comments, together with a site

map. In each case care was taken to present only that information which would have been available to the screener at the time the screening decision was made. Any information which came to light at a later date either through the environmental impact assessment or later comments from consultees was withheld. In Highland conservancy the Forestry Commission had piloted the use of an initial briefing pack prepared by proponents for schemes which can be submitted to the Forestry Commission for a decision on whether or not a project was likely to require environmental impact assessment. This took the form of (and was limited to) approximately 500 words giving brief details of the project and the site, together with a map indicating the proposed forest design. The case studies were prepared in this format, together with summaries of consultees' comments available at the time of screening. The four case studies are given in Appendix 3.1.

5.3.3 Developing a Screening Protocol

The screening protocol consists of a series of steps which systemise screening practice, and maintains a record of the reasons on which the decision has been made through use of the screening case study results sheet (Appendix 3.2). The results sheet has four sections which are completed in sequence. The initial section is a matrix which has the environmental components as described in the Environmental Assessment (Forestry) Regulations (1998) on the y-axis and a series of blank columns on the x-axis in which the screener can note components of the project which are considered to impact on the environment. Screeners are asked to first read only the site description and the project details and use the symbol **O** to identify the intersection on the matrix where impacts are considered to occur. The screener is then asked to read the consultees comments and re-evaluate the impacts identified, using the symbol ● to identify which of those impacts initially identified are actually considered to be potentially significant or key impacts.

Section 2 of the protocol asks the screener to focus attention on potentially significant impacts and describe them in as clear terms as possible. The intention is to avoid screeners giving broad descriptors such as flora or hydrology by asking the screener to give a brief description of the effect that is considered to be the result of the impact and give the reasoning behind why this is considered to constitute a significant impact. This open process should prevent impacts attributed to projects through general beliefs or preconceptions about afforestation projects. The screener is required to explicitly state the specific environmental element and project component considered to be of special concern. The screener is therefore compelled to further focus on pertinent issues, with the intention of improving screening utility. The screener is then asked in Section 3 to decide whether the case may result in potentially significant adverse impacts and should be subjected to environmental impact assessment, or any associated impacts

are non-significant in nature and the project can proceed through the normal Woodland Grant Scheme process without the need for environmental impact assessment. Section 4 allows the screener to state any special conditions which he or she would include as part of the Woodland Grant Scheme contract. (The author of this PhD was involved in the use of this technique during scoping meetings in Highland conservancy where if possible efforts were made to mitigate potential impacts at an early stage in the process. In certain cases the introduction of a simple modification to project design such as specifying scarification rather than ploughing or stipulating control of regeneration around archaeological monuments or grazing in areas of high floral interest may be sufficient to remove or reduce the potential impact resulting in a more acceptable project).

5.3.4 Screening Case Study Participants

Case study packs were prepared containing the four case study information sheets and a separate results matrix sheet for each case study. A briefing paper outlining the aims and objectives of the trial and instructions on how to conduct screening using the protocol were also included. These packs were then mailed to the six Scottish Conservators for the exercise to be conducted *in situ*, and completed results sheets returned to the researcher. To allow comparison of screening between senior and junior staff it was requested that although the exercise could be completed anonymously the screener's experience of environmental impact assessment be stated. In addition it was made clear that all four case studies should be completed by a single screener. Despite five copies of packs being sent to each of the Scottish conservancies, and requests to the Conservators and the Management Support Officer at Forestry Commission Head Quarters a total of just 7 completed results matrix sheets were returned.

Table 12. Number of completed case studies by Scottish conservancies.

Conservancy	Completed returns
Grampian	0
Highland	0
Lothian	1
Perth	5
Strathclyde	1
South west	0

Unfortunately a sample size of only 7 with only one return from two of the conservancies and no returns from three conservancies was considered to be too small to carry out any analysis of screening decisions between conservancies. It was therefore decided to pool the Forestry Commission screening results and compare these with the screening decisions of a comparative sample. The sample chosen was the class of MSc students at the School of Agricultural and

Forest Sciences, University of Wales, Bangor in 1999 who were taking a module on environmental impact assessment. The class had completed an introductory course on environmental impact assessment and were therefore familiar with the principles and concepts of environmental impact assessment, although none of the class had had any formal participation within the assessment process before. As students within the School of Agricultural and Forest Sciences, all had an undergraduate qualification in a natural science and were aware of current themes of discussion within the forest sector. The students were given an introductory lecture by the researcher on the role of the Forestry Commission within the environmental assessment process and the requirement to screen afforestation projects which are submitted for entry to the Woodland Grant Scheme. The students were also briefed about the nature of the information they were about to use to screen the four afforestation proposals, and the forms which were to be used to record their screening decisions. A total of 20 students made screening decisions on all four of the case studies. The information presented to the students was exactly the same as that given to Forestry Commission staff.

5.3.5 Screening Case Study Results

5.3.5.1 Screening Decisions

The results of the screening decisions by Forestry Commission personnel and Bangor students are presented in Table 13. Full details are given in Appendix 3.3. It can be seen that there is general consensus in the overall screening decisions within the groups for all four case studies, and general consensus between the two sample groups for Case Studies A, B and C. In Case D the majority screening decisions of students and Forestry Commission staff are conflicting.

Table 13. Case study screening decisions by Forestry Commission staff and students.

Group	Original Forestry Commission Screening Decisions							
	Case A False positive [1]		Case B True positive [2]		Case C True negative [3]		Case D False negative [4]	
	Case Study Screening Decisions of Forestry Commission Staff and Students							
	EIA[5]	Non-EIA[6]	EIA	Non-EIA	EIA	Non-EIA	EIA	Non-EIA
Students	2	18	15	5	13	7	14	6
FC personnel	0	7	5	2	5	2	2	5

[1] - case incorrectly screened for environmental impact assessment
[2] - case correctly screened for environmental impact assessment
[3] - case correctly screened as not requiring environmental impact assessment
[4] - case incorrectly screened as not requiring environmental impact assessment
[5] - environmental impact assessment required
[6] - environmental impact assessment not required

A Chi-square test was used to discern whether there was a difference in the proportion of students and Forestry Commission staff who screened the four case studies as requiring or not requiring environmental impact assessment (Appendix 3.3.3). No significant difference in the

screening results of the two groups in any of the four case studies was found. A practical implication of this is that there is no difference in screening ability between those with practical experience but little formal training and those without practical experience but had undergone training. The majority decisions for both groups correctly screen Cases A and B. However only the majority decision of students correctly screen Case D as requiring assessment while the majority of Forestry Commission staff screened Case D as not requiring assessment, the opposite of the original Forestry Commission decision. The majority decisions for both groups incorrectly screened Case C as requiring assessment.

5.3.5.2 Results of the Forestry Commission Staff

It can be seen that while the Forestry Commission staff are unanimous in their screening decision for Case Study A, for the other three Case Studies a consistent minority of almost one third will give the alternative screening decision. In addition it should be noted that the dissenting decisions did not arise from the same individuals in every case, or from the same conservancy. There was no correlation found between individuals grade or experience and their ability to correctly screen the cases. This suggests that the screening results cannot be attributed to differences in experience in administering afforestation projects or the process of environmental impact assessment alone. While the sample size is restricted to only seven, this does represent approximately 10% of the Forestry Commission staff within the Scottish conservancies who would be normally involved with screening afforestation proposals for the requirement of environmental impact assessment. This suggests that there may be a certain degree of difference between screening decisions made in the different conservancies. However due to the small sample size caution should be used if transferring this result to the screening decisions of the Forestry Commission as a whole. It is worth noting that the Forestry Commission staff's majority decision reverses the original Forestry Commission screening decision in Case C and requests an environmental impact assessment for the 'true-negative' case study, but re-affirms the original decision not to call for an environmental impact assessment in Case D which is seen as a false-negative decision originally.

5.3.5.3 Decisions of the MSc Students

Looking at the screening results of the students, while there is no unanimous screening decision for any of the case studies, the contradictory screening results range from a 1:9 split decision for Case A to a 1:1.9 split decision for Case Study C which compares favourably with the 1:2.5 split amongst Forestry Commission staff. Comparing the results of the students' screening decisions with those of the Forestry Commission staff one can see that the majority decision by the students' correctly screened three of the four Case Studies. The Forestry Commission

majority screening decision correctly screened only the first two Case Studies. However in Case Study D the Forestry Commission staff's majority decision was to allow the project to proceed without environmental impact assessment, allowing a project considered to have potentially significant adverse impacts (by the researcher and the conservancy staff which handled the case originally) to go through the planning process as a Woodland Grant Scheme application alone. Those who completed the screening case studies were also asked to propose those issues which should be considered within the environmental assessment in the cases where they had screened projects as requiring assessment. The responses from both Forestry Commission staff and the students are presented in Table 14. The table illustrates the issues raised individually by each group and those issued by both groups. Full results are given in Appendix 3.3.

Table 14. Issues raised by Forestry Commission staff and students through screening the case studies.

Group	**Case A** **False Positive** **Impacts/Cause**	**Case B** **True Positive** **Impacts/Cause**	**Case C** **True Negative** **Impacts/Cause**	**Case D** **False Negative** **Impacts/Cause**
Students only	Water quality/ground preparation Flora/ pesticides	Soils/natural regeneration	Flora/drainage Flora/deer Flora/planting Flora/drainage Access/fencing Landscape/planting Water quality/planting Water quality/pesticides	
Students and FC personnel		Flora/deer Landscape/fencing Cultural site/grazing change Access/fencing Water quality/pesticides Flora/pesticides		Birds/habitat loss
FC personnel only		Birds/fencing Birds/regeneration	Soils/ground preparation Cultural site/planting Flora/ground preparation Landscape/ground preparation Water quality/ground preparation Water quality/fertiliser Land use balance/planting	Soils/planting

5.3.5.4 The Identification of Key Issues

It can be seen in Table 14 that in Cases B and D which should have been called for an assessment, the potentially significant issues identified as requiring investigation by both groups are generally comparable. While a small number of additional issues were identified separately by both groups, in particular with Case B, the majority of key issues are common to both groups. While close correlation could be expected in Case B where the majority decision of

both groups correctly screened the project, in Case D where the majority decisions are not in agreement the issues identified by both groups generally concur. The results from Case B suggest that where the majority decision of both groups screen projects as requiring assessment and there is general agreement on the issues which should be addressed the screening decision is correct. While the majority decision of the groups do not agree in Case D there are only two issues requiring assessment raised between the groups. All individuals from both groups raised the issue common to both groups. Following on, where the majority decision of both groups have screened projects as requiring assessment, but there are no, or few, issues identified for assessment that were common to both groups, the majority screening decision of both groups is incorrect.

The results show that a consistent screening decision was not given by either group. Except in one case a minority of respondents always gave the alternative screening decision. Comparison of the two groups suggests that the majority decision of the students gives a correct screening decision more often that the Forestry Commission staff. Additionally focusing on the Forestry Commission responses, the majority decision called for a false positive case and also failed to call a true positive case. The reliability of screening determinations by both groups can be questioned. However this should be tempered with the acknowledgement of the small sample size.

5.4 Perceptions of Environmental Impact Assessment in the Forest Sector

5.4.1 The Use of Questionnaires

In the absence of the researcher being able to directly interview more than a very limited number of Forestry Commission personnel on the subject of environmental impact assessment, it was considered appropriate to include a brief questionnaire with the screening case studies in order to gather further information on the experience of Forestry Commission staff involved in the environmental impact assessment process. The objective of this exercise was initially to allow the analysis of screening performance in relation to the experience of the operative in terms of familiarity with environmental impact assessment issues and the number of environmental impact assessments each screener had been involved with, together with experience of Forestry Commission internal procedures and the WGS process in general. However this was expanded to gain information on assessment practice among other actors within the sector. While the importance of the Forestry Commission staff being fully cognisant of the assessment process can be easily seen, without adequate understanding of the process among other actors, the process will never fulfil its potential (Lee and Wood, 1985, Lichfield, 1992a, Baah, 1995).

5.4.2 The Selection of Questionnaire Recipients

During the preparation of the questionnaire for Forestry Commission personnel, it was decided to widen the target of the questionnaire to other actors within the environmental impact assessment process within the forest sector, namely consultees and those responsible for carrying out assessments and preparing environmental statements. Within these groups the focus was not, however, on the screening of proposals as in the Forestry Commission questionnaire. Here, the focus was to gather information on the knowledge and understanding of the processes and techniques currently available within environmental impact assessment, and to gain opinion from those involved in the environmental impact assessment process. During the ten years since the introduction of environmental impact assessment to the forest sector, although consultative documents have been circulated by the Forestry Commission when changes to legislation was impending, no form of discussion of the merits and limitations of the environmental impact assessment process had been carried out. The researcher has been invited to give presentations on assessment procedures during a series of both internal Forestry Commission and open public seminars on environmental impact assessment. During these seminars it was evident that the level of understanding among the various actors involved, both as individuals and organisations, varied from almost no awareness to highly experienced, although very few in the latter case. Some individuals illustrated a high level of understanding of the role of environmental impact assessment within the decision making process and their responsibilities. Similarly through the presence of internal environmental impact assessment procedures certain organisations (such as the Royal Society for the Protection of Birds and Scottish Natural Heritage) had obviously began to have a corporate view on environmental impact assessment. However there was a pronounced general lack of understanding of environmental impact assessment and the processes and techniques which may be involved in assessment. Hence it was considered appropriate to devise a questionnaire, which could draw perspectives on the use of environmental impact assessment within the forest sector, from as wide a range of actors as possible. Therefore in order to accommodate the various groups three separate questionnaires were prepared for:

- Forestry Commission personnel involved in the environmental impact assessment process;
- Forest sector environmental impact assessment practitioners;
- Consultees involved in the environmental impact assessment process.

5.4.3 Questionnaire Design – a Review of Best Practice

The preparation of all three questionnaires followed the guidance outlined by Marquis (1972), Sudman and Bradburn (1982), Fink and Kosecoff (1998) and Sapsford (1999) and where the essential element of questionnaire design is to keep the questionnaire as a whole, and the

individual questions short and simple. Within the series of questionnaires this was considered imperative if an acceptably high return rate was to be achieved. With the questionnaire being carried out on a postal basis, the return rate is dependent on the goodwill of the respondents. Hence it was considered that the questionnaires should be limited to a maximum of two sides of A4. As discussed above, the experience of environmental impact assessment and the understanding of the processes involved among the respondents was considered to cover a wide range. Sudman and Bradburn (1988) suggest that unfamiliar terms should not be used or if comprehension is in doubt, any such terms should be included in a glossary within the questionnaire. Further, Sudman and Bradburn (1988) warn against the use of broad terms or descriptions which are open to interpretation. Also terms which could act as positive or negative stimuli should be avoided to prevent questionnaire bias to single questions or the questionnaire as a whole, where the respondent tries to give the answers she or he believes the questioner wishes to obtain. Therefore questions should be as targeted as possible and unambiguous. The placement of two or more elements within one question was to be avoided. Payne (1951) and Cantril (1944) stress the importance of making questionnaires easily understood. However within surveys prepared for particular professions, the use of technical terms in common usage can assist the clarity of the question as they can have single precise meaning unlike everyday terms which may be vague or ambiguous to professionals.

Sudman and Bradburn (1988), Hague (1993a and 1993b) and Fowler (1995) all suggest the use of closed rather than open questions to obtain specific quantifiable and standardised responses. In particular the use of forced choice questioning, where the respondent has the choice to agree or disagree with a statement is advocated to give an unambiguous response. Where a larger number of alternative responses are appropriate Converse (1986) suggests that the 'middle' alternative be omitted where possible as this safe option allows a refuge for the lazy or indecisive respondent. Finally as the questionnaires are self-conducted Fowler (1995) stresses the need to ensure the questionnaire is easy to read and advocates the vertical alignment of questions. Further Sudman and Bradburn (1982) advise that the series of questions should follow a recognisable pattern and that their content should be in line with the respondent's anticipated context. Thus the three separate questionnaires were designed within the above suggestions of best practice. The full questionnaires are included in Appendix 3.5.

5.4.4 Methodology

The questionnaire for Forestry Commission personnel was sent to the six Scottish conservancy offices. It was requested that each member of staff who completed the screening case study exercise complete a questionnaire. From the six conservancies a total of 6 completed questionnaires were returned. For the environmental impact assessment practitioners, where an

individual or organisation was named in the environmental statement as author, or in cases where the Woodland Grant Scheme files were made available during the review of forest sector environmental statements, the owner, agent or manager named in the Woodland Grant Scheme contract was sent a questionnaire. Questionnaires were sent to a total of 38 environmental impact assessment practitioners, of which 20 were completed and returned. Similarly, during the review of forest sector environmental statements a database was established of consultees, (as either individuals or organisations), identified in the environmental statements or named within those Woodland Grant Scheme case files made available. From this database a total of 40 questionnaires were sent to a range of consultees, of which 19 were completed and returned. The response rates are comparable with the indicative return rates given by Czaja and Blair (1996) and Gillham (2000). Of the 40 consultees identified within the environmental statements only 10 were not statutory consultees, and 5 of these were from the same organisation the RSPB. This supports the findings of the review of environmental statements in Chapter 4 which indicated the overall low level of open consultation and in particular the almost complete absence of public involvement. Questionnaire respondents are identified in Appendix 3.4. The number of questionnaires sent out and returned in each category is shown in Table 15.

Table 15. The number of questionnaires sent to and returned by Forestry Commission staff, EIA practitioners and consultees within the forest sector.

Category	Number sent	Number returned	Percentage returned
Forestry Commission	30	6	20
EIA practitioners	38	20	53
Consultees	40	19	48

Although 89 environmental statements were reviewed, very few statements actually included references to consultees. Thus, if these cases coincided with those for which the Woodland Grant Scheme case file was not obtained, no record of the consultees involved in that case could be made. Similarly 20% of environmental statements did not include an authors' name and/or contact details for which the WGS case files were not obtained. Hence it was not possible to send questionnaires to the authors of these environmental statements. Further, although 89 environmental statements were reviewed the total number of consultees involved is somewhat limited due to the fact that many of the organisations have appointed staff to handle environmental impact assessments and/or forestry projects. Thus, in separate conservancies it was found that the same selection of individuals were repeatedly consulted on all environmental statements. In the case of the Deer Commission for Scotland acting as a consultee, one individual is the main contact on projects called for environmental impact assessment or impacts associated with deer.

5.4.5 Responses Derived from the Questionnaires

5.4.5.1 Forestry Commission Staff

The questionnaire distributed among Forestry Commission conservancy staff was prepared following discussion with the Forestry Commission (Scotland). Although 30 questionnaire sheets were sent to the six Scottish conservancy offices along with details that additional copies could be made if required, only 6 completed questionnaires were returned. Of these four were from the Perth conservancy and two were from the Strathclyde conservancy. The experience or level of authority ranges from a junior Forest Officer III grade to one Conservator at Forest Officer I grade. The average compliment of staff for a conservancy who may be involved in the environmental impact assessment process is approximately eight to ten. This gives a total conservancy staff who may be involved in the assessment process in Scotland of around 50 to 60. The return rate for the questionnaires among all available staff is therefore 10%. With such a small sample size, caution must be used when interpreting the results and generalising on a Forestry Commission wide basis. Unfortunately despite requests that Forestry Commission staff who completed the screening case studies should also complete a questionnaire, not all questionnaire responses coincided with a completed case study pack. The reasons for the low return rate from Forestry Commission staff are unknown. The return rate may however indicate that while senior staff who sanctioned conservancy staff involvement are becoming aware of the need to develop the Forestry Commission's capacity, the majority of Forestry Commission conservancy staff regard environmental impact assessment as a low priority, or that there is little interest in improving environmental impact assessment within the sector. The poor quality of environmental statements which continue to be accepted by the conservancies as noted in the Chapter 4 supports this.

5.4.5.1.1 Experience of Environmental Impact Assessment and Screening

The responses for Question 1 indicated that experience of the environmental impact assessment process was greater among those senior officers, with the Forest Officer I and II grades having administered more projects than the Forest Officer III. However the most senior respondent commented that although he had administered a number of environmental impact assessments, his input had been limited in some cases to overseeing the process which is generally handled by the junior officers. The role of the senior officer is ratifying the decisions of junior staff on screening and the ultimate decision on the fate of the Woodland Grant Scheme application. The respondent also noted that the manner in which each conservancy operates is at the discretion of the Conservator and the *modus operandi* of the conservancies should not be assumed to be standardised.

Table 16. Forestry Commission questionnaire responses.

Question 1 How many environmental impact assessments have you prepared?	%
0-2	0
3-5	50
6-9	50
10+	0
Question 2 Are consultees involved in the screening process?	%
Never	0
Rarely	34
Frequently	66
Always	0
Comments: Now a formal procedure [F1] All consultees contacted, quality of response variable [F2, F6]	
Question 3 Do you believe the current screening process accurately identifies projects with potentially significant adverse impacts?	%
Never	0
Rarely	0
Frequently	50
Always	50
Question 4 Do you use any tools to aid screening (e.g. matrices, checklists)?	%
Yes	34
No	66
Comments: Use a combination of EU guidance and checklists [F1] FC constraints map [F5]	
Question 5 Are you involved in a formal scoping process for individual environmental impact assessments?	%
Never	0
Rarely	0
Frequently	17
Always	83
Question 6 Do you use any tools to aid scoping (e.g. matrices, checklists)?	%
Yes	17
No	83
Comments: FC constraints map [F5]	
Question 7 Are consultees involved in the scoping process?	%
Never	0
Rarely	0
Frequently	17
Always	83
Comments: Always invited but rarely turn up [F1, F2]	
Question 8 Do you believe the current scoping process accurately identifies potentially significant adverse impacts?	%
Never	0
Rarely	17
Frequently	83
Always	0

Comments: It can identify most impacts but often includes several that may not be truly significant [F2] Some consultees tend to hold back a point bringing it in later to 'trump' the ES [F1]	
Question 9 Do you believe ESs give factual, unbiased assessment of potential impacts?	%
Never	17
Rarely	17
Frequently	49
Always	17
Comments: I never believe what I read in an ES [F1] Mostly poor [F2] Early ones biased, recent ones more factual [F5] Only decent once drafts have been re-written [F4]	
Question 10 Do you believe ESs provide information that is useful in the decision making process?	%
Never	0
Rarely	34
Frequently	66
Always	0
Comments: Would only help decision if truly objective and compiled accurately – bias and subjectivity too often compromise the ES [F2] We often get the information during scoping – new information is very rare [F1]	
Question 11 How useful do you see environmental impact assessment as a method of environmental protection?	%
Not at all useful	0
Of limited use	17
Useful	66
Very useful	17
Comments: Could be better fails due to subjectivity [F1] Don't consider off-site impacts [F5] Not any better than a good WGS [F4]	
General Comments: We tend to be overcautious and need to be more confident in the normal WGS process [F3] Main weakness is the link with the public [F6] Long and expensive [F4] No public involvement [F4] Still treated as a hurdle by applicants who pay lip service to process and muddying the waters for decision makers [F1] Never seen an objective assessment [F1]	

[F] – Forestry Commission respondent number

The Forestry Commission is the competent authority for environmental impact assessment within the forest sector and as such has the responsibility for screening projects. The responses indicated that within the last two to three years the screening process has changed in format and rigour. In the past the Forestry Commission officers frequently screened projects without any or with only limited discussion externally with consultees. This response is interesting in the fact that the Forestry Commission is the Government department responsible for forestry and its main field of expertise and that of the majority of its professional field staff is forestry and woodland management. Forestry Commission staff should therefore be in an excellent position to screen projects for their impact on woodlands and forests.

However, afforestation projects however, do not, in general impact on existing woodlands and forests. Their impacts are typically located in non-forest environmental elements such as the flora and fauna of open moorland, water bodies, landscape and archaeological sites. It is generally accepted that the Forestry Commission and its personnel may not be leading authorities on the importance, fragility or function of many of these receiving elements. However, paradoxically the Forestry Commission is charged with deciding whether or not these elements will be impacted and if the impact can be expected to be significant or non-significant. One way of ensuring that appropriate screening decisions are made would be the inclusion of those bodies with appropriate experience into the decision making process at an early stage. Provision for this has been made within the various statutory instruments whereby the Forestry Commission can consult with statutory bodies. The Forestry Commission Woodland Grant Scheme files which accompanied the reviewed environmental statements contained little evidence that consultees were being fully involved in the screening process. Generally contact was limited to the statutory consultees such as SNH, local authorities, the Deer Commission Scotland and the Agricultural Departments, in line with the minimum legislative requirements. The responses often lacked local knowledge or even interest in the proposal site. In a number of cases the contents of the files suggested that rather than limit screening discussion to only the statutory consultees, the process would be eased if the Forestry Commission opened this process. This would not ask individuals and organisations whether the project requires an assessment, as this is the sole responsibility of the Forestry Commission, but ask for interested parties to submit relevant information which is already held and should be used within screening. The files also suggested in a number of cases that the Forestry Commission had already made a decision to call for an assessment, but still contacted consultees for supporting comments. The whole ethos of environmental assessment is to ensure that the best possible information is used in making decisions. If information is not being gathered by the Forestry Commission merely because it is not held by one of the statutory consultees, then the spirit of the process is not being upheld.

The reasons for screening being, until recently, largely internal within the Forestry Commission can be drawn out from the questionnaire responses from Forestry Commission staff, practitioners and consultees. The Forestry Commission is under considerable pressure from applicants to make a decision with the minimum of delay. The widening of screening would inevitably lengthen this process. In the vast majority of the 2000 projects received annually the Forestry Commission officers make a judgement without referral to a wider consultation process. The issue is what should trigger the widening of the process to external consultees. The Forestry Commission must ensure that where adequate knowledge or experience of a particular situation is not available within the Forestry Commission, expert advice should be

sought. This may or may not be from the statutory consultees. Discussion with consultees' field staff by the researcher found that in certain areas statutory consultees are unable to give adequate resources to this stage of assessments.

This was supported by a number of 'stock' responses by consultees held within the case files which made no commitment at that point but reserved the right to comment at a later stage in the process, and did nothing to assist the Forestry Commission screening decision. However in other areas certain consultees were very active and commented on all cases forwarded to them. Many of these were not specific comments about the proposal in question but general comments either supporting or opposing afforestation citing reasons of land use balance, acidification or landscape impacts without giving any specific information about the project in hand. The use of strategic plans on land use and afforestation in particular could be thought of as a useful mechanism through which consultees could also screen their interest in proposals. The creation and use of indicative forestry strategies has been detailed by Goodstadt (1990), and the use of strategic environmental assessment as a means of addressing potential impacts at a higher level are discussed by Lee and Walsh (1992), and Therivel, Wilson, Thompson, Heany and Pritchard (1992). However the use of indicative forestry strategies as a method of screening proposals does not appear to be particularly helpful as there were many cases where projects were situated within zones favoured for afforestation, but the local authorities voiced opposition to the projects in generalised, non-specific terms.

It should be remembered that this is the first and crucial step in ensuring an effective environmental impact assessment process. Too lenient screening may allow projects with potentially significant impacts to proceed without assessment. Screening carried out in too dogmatic a fashion may involve more projects in the process than is actually necessary imposing an undue burden on project proponents. The responses on whether screening accurately identifies those projects with potentially significant impacts follows on from this where only 50% consider that the process always identifies the correct projects. This suggests that Forestry Commission field staff feel that a proportion of cases are therefore false positive or false negative determinations. Most Forestry Commission staff were unaware of the range of tools available to assist screening. The fact that two respondents answered the question in the negative then provided a list of techniques which are commonly used screening tools suggests that the level of understanding of the process is generally low. Overall the use of tools is limited and where these are used, restricted to the most basic of checklists and overlays. The use of overlays has been a regularly used method in screening as all conservancies will have, and use, maps to determine the relation of the proposed site to areas covered by special designations such as SSSI, NSA, NNR, ESA and critical loading squares. The fact that two

thirds of respondents did not consider the use of maps, and interestingly geographical information systems, as screening tools suggests a less than comprehensive understanding of the basic techniques available to the decision maker and environmental impact assessment practitioner. It is also interesting to note that the systems used to maintain a record of the screening decision are not standardised between or within conservancies. In many cases files contain no documented record of whether a project has or has not been called for assessment and the information on which this decision has been made. The best examples were in conservancies which used forms to record key decisions, however, the information supporting the decision was rarely provided and in no conservancy could the system be thought of as representing best practice. The responses given here and the information provided within the Woodland Grant Scheme case files pre-date the 1999 assessment legislation which requires the maintenance of screening decision registers at all conservancies.

5.4.5.1.2 The Scoping Process

The responses to questions relating to scoping suggest that once the decision has been made that a project requires an environmental impact assessment the identification of important issues is carried out with much more certainty. However this would contrast with the results of the review of sector environmental statements where the failure to adequately scope the range of issues included in the assessment led to the majority of environmental statements being unfocused and attention misdirected. The responses on the use of tools for scoping suggests there is a greater use of tools within this process than used within screening, however the same limited suite of tools are commented on. As with the screening process, the process of scoping has altered dramatically in the last two to three years. This has been, in part, a result of the earlier work (Gray, 1996 and Gray and Edwards-Jones, 1999) in addition to Lee and Dancey's (1993) work on Irish environmental statements which highlighted the failure of forest sector environmental statements to adequately set the scope of the assessment. Until the late 1990s scoping was not considered by the Forestry Commission to be an area in which it had a large role to play. Once it had called for an assessment it was the Forestry Commission's view that it was the responsibility of the proponent to decide what was included in the assessment and what was finally presented in the environmental statement.

Until the late 1990s there were very few cases where scoping meetings were held to determine which issues were to be considered in the assessment. Scoping was usually carried out by the proponent alone deciding what was to be addressed, or using the issues mentioned in the Forestry Commissions' notice that an assessment was required, which were frequently described only in broad terms such as scale, land use balance or landscape impact. The result, as shown in the above works was misdirected assessments which did not provide the decision-

maker with additional, competent and relevant information. The review of sector environmental statements within this research has supported these earlier research works. In an effort to improve scoping the Forestry Commission employed the researcher to act as facilitator at a number of newly convened scoping meetings between Forestry Commission, proponent and statutory and non-statutory consultees during 1996 to 1998. The researcher also provided presentations to a number of internal Forestry Commission seminars and workshops on environmental impact assessment. This has resulted in an initiation of change of practice, which is not apparent in the environmental statements from the period 1988 to 1998 which were reviewed. The role of the Forestry Commission is now considered to be much more authoritative during scoping and conservancy staff are becoming aware of the importance of scoping, however the comments from consultees and proponents suggest that the role of the Forestry Commission is still not understood within the sector although this may be in part due to the fact that the different conservancies are moving at different speeds on the implementation of this new approach.

Two respondents noted that although their conservancy always convenes a scoping meeting and invites consultees, there is rarely attendance by the consultees. Whether this lack of participation was due to a definite decision that there were no issues of interest to those consultees, or that the consultees were absent due to reasons of resources was unclear. However, the result of participants of scoping meetings being absent only to return to the process once the assessment is underway has been stated earlier, but is apparently not uncommon. In conversation with the researcher, Forestry Commission staff and proponents gave examples of consultees' late additions to the assessment process despite initially not participating in the scoping process. Despite the advancements in recent years there still appears to be a lack of confidence among Forestry Commission staff to lead scoping and focus on only the most important issues. The inclusion of issues of which assessment is not actually required is apparently still a concern of Forestry Commission staff.

5.4.5.1.3 The Benefits of Environmental Impact Assessment

The final three questions presented to Forestry Commission staff were designed to gain their impression of the usefulness of the process as a whole and the use of its output for them during the decision making process. The responses indicated that within those for whom the process is primarily aimed, to provide them with the additional information they need to make a reasoned judgement there is at best reserved acceptance, and at worst open mistrust of the output from the process. The comments provided by the respondents suggest that the Forestry Commission staff themselves are fully aware of the shortcomings of many of the environmental statements with which they are presented. Problems such as bias, lack of factual information specific to

the site in question are all mentioned. Tempering the ready acceptance of the poor standard of many forest sector environmental statements by the competent authority's staff can be seen as the one of the first steps to improving the standard. However, if it was known that the standard was low why were these environmental statements accepted by the Forestry Commission as suitable for introduction to the decision making process?

The comments from respondents suggested that they themselves believed that the process was flawed due to bias and that there is very little new information brought out through the assessment and preparation of an environmental statement. One respondent noted that the process could be halted at the scoping stage, as most of what is important to them for making a decision is brought out then, what the environmental statement does is merely to cloud the issues through bias and subjectivity. Two respondents suggested that the Forestry Commission were being overcautious, and that a robust Woodland Grant Scheme application could serve as well if not better than the environmental impact assessment. These comments would support the view that too many projects are called for assessment. If environmental statements do not present the decision makers with additional information they feel they can safely use when coming to their decision, or allow the public to comment on afforestation proposals, the reason for calling these assessments could be questioned. The comments also give support to the argument that the environmental impact assessment process in the forest sector is caught in a downward spiral in terms of quality.

The competent authority's staff is wary of the output of assessments and feel they gain little of value from the process, however to avoid the risk of complaints and charges of lack of rigour the Forestry Commission appears to have called for assessments without a clear understanding of the underlying reasons. Robust screening and scoping which would dismiss unnecessary cases was not carried out with any authority and so the cases continue through the process. However, since the proponents believe there are few real questions to answer the standard of assessment is low and since the Forestry Commission's staff do not feel there is much to gain anyway from the process they do not intervene to ensure the project was properly scoped and the output objective. The result is quick, easy and relatively useless assessments, and because they are quick and easy (only one case from 101 has been rejected) it does not matter if many are called. Proponents are almost forced to go through with the process as their project will be stalled without it.

The number of projects called for assessment is far higher than what is really required but the standard of assessment falls as no-one is really interested in the output of the assessment, only that the process is seen to be carried out. The result is an undue burden on afforestation project proponents, in the case of false positive screening and poor assessment of potentially significant

impacts, in the case of true positive screening, both of which outcomes can have a deleterious effect on the forest sector.

5.4.5.2 Environmental Impact Assessment Practitioners

The responses on the experience of environmental impact assessment practitioners within the questionnaire sample correspond with the information gathered during the review of forest sector environmental statements.

5.4.5.2.1 Experience of Environmental Impact Assessment

Three quarters of environmental impact assessment practitioners have prepared up to five environmental statements, with 50% having experience of only one or two assessments. Also in common with the data gathered from the review of forest sector environmental statements is that there is a core group of individuals who have prepared more than 10 environmental statements. This is much more concentrated than the results given by Weston (1995) but corresponds with the results given in Section 4.7.

Table 17. Environmental impact assessment practitioner questionnaire responses.

Question 1 How many EIAs have you prepared?	%
0-2	50
3-5	25
6-9	5
10+	20
Question 2 How do you regard the guidance given by the Forestry Commission on how to conduct an EIA and prepare an ES?	%
Not at all useful	0
Of limited use	26
Useful	63
Very useful	11
Comments: Advice not specific or detailed enough [P4, P5, P6, P9, P10, P13, P20] A blueprint of what is expected in a competent assessment would be useful [P 16] The advice given during the course of a single assessment changes [P14, P19, P20] The advice given during the scoping exercise is vague [P9, P16, P20].	
Question 3 Do you consider EIA to be a useful process which can aid project planning?	%
Never	0
Rarely	35
Frequently	55
Always	10
Comments: Doesn't help grow trees - site classification is more important for establishment [P13] Allows changes to be made early in planning [P1, P2, P6] Mis-used by consultees [P4, P7, P9, P12, P18] Generally more of a negative effect than a positive one [P4] Useful if assessment streamlined to key issues [P4, P15, P20] Useful for larger projects, off-putting for smaller schemes [P3, P7, P9, P14] Depends on competence of [Forestry Commission] Woodland Officers [P20]	

Question 4 Have you ever withdrawn a project due to it being called for an EIA?	%
Yes	35
No	65
Question 5 Do you undertake a formal scoping process for individual EIAs?	%
Never	5
Rarely	0
Frequently	26
Always	69
Comments: The Forestry Commission organise scoping [P3, P4] The Forestry Commission carry out/assist scoping [P18, P19] Initial assessments did not include scoping now it is seen as an essential part of the process [P15, P17] The potential of scoping is not fully utilised [P9, P12, P15, P19]	
Question 6 Do you use any tools to aid scoping (e.g. matrices, checklists)?	%
Yes	47
No	53
Comments: We do not need any tools as the Forestry Commission do it for you [P19] Scoping doesn't identify key issues, the goal posts are moved anyway during the environmental impact assessment [P5, P7] Scoping is a waste of time as the consultees are not interested, so issues come to light later in the process [P19]	
Question 7 Which of the following do you normally involve in the scoping process?	%
Forestry Commission	100
Scottish Natural Heritage	100
Local Authorities	100
SEPA	58
Local groups	53
RSPB	79
SOAEFD	84
Others	68
Comments: No need to do this as the Forestry Commission draws up a list of consultees [P12, P18, P19]	
Question 8 How often do you use specialised consultants for predicting and assessing potential impacts?	%
Never	10
Rarely	15
Frequently	60
Always	15
Comments: Only for specialist's endorsement, otherwise all carried out in-house for reasons of cost [P2] Use specialists as little as possible, only for specialised work [P4, P5, P16] Experts used only when subject is critical for the project [P3] Experts used for vegetation and landscape surveys only [P9, P12, P17]	
Question 9 How would you rate your most recent ES as a mechanism for providing decision makers with specific, unbiased information on the potential adverse impacts of the project?	%
Not at all useful	5
Of limited use	15
Useful	45
Very useful	35
Comments: This was a small scheme, no changes resulted from the environmental statement, why was it called for environmental impact assessment? [P9]	

Useful for decision makers and consultees but not for the public [P1, P3, P11] The findings included in the environmental statement were not believed by the consultees [P7, P12] Our last environmental statement was returned five times for re-writes [P19]	
Question 10 What is the average cost of an EIA?	%
£0-5000	21
£6-10000	32
£11-20000	37
£20000 +	11
Question 11 How useful do you see EIA as a method of environmental protection?	%
Not at all useful	0
Of limited use	40
Useful	40
Very useful	20
Comments: The potential is there to make the process much more valuable [P4] All the mechanisms of safeguard are already in the Forestry Commission system [P7, P8, P18] Useful when appropriate, too many environmental impact assessments called in forestry [P9, P12, P18, P19] Useful if scoping done correctly [P12, P15, P17, P19]	
General Comments: Cost is off-putting [P3, P11, P12] Needs streamlining. No focus [P3, P4, P12, P15] Little more than a gauntlet-running exercise to justify proposal [P7, P12] Misused by consultees raising issues at last moment unchallenged by the Forestry Commission [P7, P13, P18] Painful process [P9] WGS should be sufficient in most cases [P4, P9] Forestry Commission just calling for environmental impact assessments to cover their backs [P9] Consultees use scatter-gun approach [P7, P12, P15] Little public involvement [P11] Much effort wasted on gathering unnecessary information [P15, P18, P19] Practical in the past – now less useful [P18] Lack guidance and stability from the Forestry Commission [P10, P15, P19]	

[P] – Environmental Impact Assessment Practitioner Number

5.4.5.2.2 Guidance From the Forestry Commission

The responses outline that almost three-quarters of all respondents consider the advice of the Forestry Commission to be useful or very useful. While no respondents classed the advice of the Forestry Commission as not at all useful, 26% classified the guidance as of limited use. In analysis it was noted that respondents awarding the poorest grading were those with the least experience in environmental impact assessment as recorded in Question 1. The main concerns of the respondents were that of what exactly the Forestry Commission wanted out of an assessment in terms of information requirements. The practitioners felt that the Forestry Commission did not fully understand what should be the output from the process. Details on the roles of the different people, how scoping should be carried out and what can be considered as a significant impact, are all examples of the type of information sought from the Forestry Commission by practitioners. This has already been proposed as a necessity in the scoping process in Section 4.4.2.1. The Forestry Commission as competent authority has a role in assisting those involved in carrying out assessments. However, many of the topics on which

information is being sought by practitioners is at a basic level which could be obtained from a range of introductory texts freely available or through a number of training courses which although not forest sector specific would provide generally applicable theories and techniques. While the Forestry Commission does have a role in ensuring the effective application of the process within the sector, whether the Forestry Commission should be responsible for providing for the basic education of the sector in the process of environmental impact assessment is debatable. While other government departments and agencies (Countryside Commission, 1987; the Department of Environment, 1987, 1988, 1989, 1994a, 1994b, 1996; the Scottish Development Department, 1988; the Scottish Office, 1990; the Department of Trade and Industry, 1992; the Department of Transport, 1994 and the Scottish Office Environment Department, 1994) have prepared guidelines on the assessment of impacts they have not undertaken to provide edification on the principles of environmental impact assessment.

5.4.5.2.3 The Use of Environmental Impact Assessment in Project Planning

While no respondents graded environmental impact assessment as never being a useful process within project planning, 35% of respondents considered that assessments rarely assisted the planning of an afforestation proposal. Almost two thirds of the respondents classified their experience in the top two grades. It is notable within the returns, respondents with greater experience of environmental impact assessment found the assessment process to be more useful as an aid to project planning. There was generally an acceptance that in the correct circumstances the environmental impact assessment process was a useful undertaking and did allow improvements to be made to projects at an early stage. Unfortunately only three of the respondents considered the process to be anything other than a planning hurdle. Only three respondents indicated that the inclusion of the ethos of assessment within their own planning cycle, was being carried out and the assessment process something which would be adopted internally at an informal level. All three of these respondents did remark however that adoption of the process did allow issues to be identified early on in the process and changes could therefore be made more easily. In the majority of respondents, however, the process is seen as an external procedure which is only carried out when imposed by and to satisfy the requests of the Forestry Commission.

5.4.5.2.4 The Cancellation of Proposals

To ascertain whether or not the assessment process is considered to be a barrier to progressing an afforestation proposal, practitioners were asked if they had ever withdrawn a proposal due to it being called for assessment. Over one third of all respondents noted that a project had been abandoned following notification that an environmental impact assessment was required. In those practitioners with experience of more than six environmental impact assessments, all but one confirmed that projects had been withdrawn. The remaining respondent from this group

noted that numerous schemes had never reached the application stage because of the potential threat of environmental impact assessment.

5.4.5.2.5 The Practice of Scoping

Focusing on the scoping process, again all of the respondents with experience of more than six environmental impact assessments confirmed that a formal scoping stage was frequently or always included. This figure conflicts with the results of the review of forest sector environmental statements where the absence of a rigorous scoping exercise was found to be a common failure. This variance could possibly be explained that although a scoping exercise had been carried out it was not documented in the environmental statement. Investigation of the accompanying Forestry Commission Woodland Grant Scheme case files highlighted that few provided documentary evidence of a scoping exercise, with scoping being limited to the statements within the initial Forestry Commission letter to the applicant informing of the requirement to conduct an environmental impact assessment. There was consensus among respondents that if key issues are identified at the earliest possible juncture the subsequent environmental impact assessment was carried out more effectively. Evidence supporting this opinion does not appear to be filtering through to the environmental statements. There was a general lack of understanding of what the scoping process was aimed at achieving and who should take the lead in the process. The recent advancements in the role of the Forestry Commission as described earlier may play some part in this confusion as many practitioners are engaged with more than one conservancy and therefore may see different techniques and procedures in operation. Two respondents claimed that scoping was no longer an issue of concern to them as scoping was completed by the Forestry Commission who then decided what to include in the assessment. As discussed earlier the role of the Forestry Commission during scoping has recently been augmented and most conservancies now convene and chair scoping meetings as a means of ensuring assessments are adequately scoped. The Forestry Commission does not as such make the decision as to what should or should not be addressed within the assessment. This should arise from the discussions held at the scoping meetings. Interestingly following on from Question 5, although 95% of all respondents claimed to frequently or always carry out a scoping exercise, over half used no tools to assist the scoping process. One respondent stated that tools are not required as the Forestry Commission carries out scoping on the proponents' behalf.

The lack of the use of scoping tools is partly due to the fact that until recently scoping was not being carried out as a definite step in the assessment process. However as discussed with the responses from Forestry Commission staff, there is a basic lack of understanding of the range of tools and techniques that are available to the environmental impact assessment practitioner.

The lack of the use of tools further supports the results of the review of forest sector environmental statements that forest sector assessments have been unfocused and have tended to be unguided in terms of what should be considered as key issues. Assessments have frequently been centred on the initial Forestry Commission letter advising of the requirement for assessment, effectively missing out of one of the basic elements of the environmental impact assessment process. A recurring issue was that of the futility of scoping in the way that consultees are not prepared to invest resources at an early stage of the process and later on introduce new issues that must be addressed thereby delaying the assessment and increasing its cost. This problem is an obvious and definite possibility where rigorous scoping is not carried out which sets out the key questions for the assessment to answer and the role of the competent authority as arbiter ensuring that key issues are covered without placing undue requests for information on proponents is not clearly defined.

The responses on which bodies are regularly involved within the scoping process indicate that the main statutory consultees, namely the Forestry Commission, local authorities and Scottish Natural Heritage are always consulted in the scoping process. This is much higher than Weston's (1995) results where the Nature Conservancy Council and local authorities claimed to be involved in 51% and 23% of cases respectively. This is also much higher than the levels of consultation identified within the environmental statements reviewed (Section 4.4.2.1). Interestingly, 53% of respondents claim to have included local groups, however the review of forest sector environmental statements highlighted the absence of local consultation in all but 7% of cases. In addition responses from Forestry Commission staff specifically included the lack of public involvement within the process. Consultees named within the *'Others'* category included Historic Scotland, the MacCaulay Land Use Research Institute and the Deer Commission Scotland. Interestingly three respondents noted that there was no need to be concerned with who should be involved in scoping as the Forestry Commission had the task of inviting consultees. Again this shows a lack of understanding of the process as it is implemented within the forest sector, and the underlying principles of environmental impact assessment as a whole. The fact that environmental impact assessment practitioners do not feel sufficiently empowered to involve additional consultees, or they cannot see the benefits of involving as wide a range of stakeholders as is required to fully scope the assessment, should be a cause for concern. The limitation of the scoping process to a restricted group does give rise to unfocused and poor assessments, and it suggests a lack of understanding of the process and lack of commitment to the ultimate aim of preparing the best possible afforestation proposals, which result in minimal adverse environmental impact. The involvement of local groups is noted as being low with just over half the respondents claiming that local groups are involved during scoping. The findings from the review of sector environmental statements and the

accompanying files suggest that this figure may be an optimistic estimate as evidence of input from local groups during scoping was very rare.

5.4.5.2.6 The Value and Cost of Environmental Impact Assessment

The review of sector environmental statements indicated that the level of use of specialist environmental impact assessment consultants within the process was low. While 75% of respondents gauged their use of consultants as frequent or always this must be considered with the attached comments in mind, suggesting that while specialised consultants may be engaged regularly, their application is to a limited range of topics where specialist knowledge in not available in-house. This use of specialists is common across sectors however the compartmentalisation of the specialists' input within the forest sector does give cause for concern. The results of the review of sector environmental statements indicated that where specialist consultants are used they are generally asked to carry out a survey and prepare a report on, for example, the flora or fauna of the area in question. The specialist will then carry out field work if required and prepare a report which generally took the form of a simple presentation of what was in existence and did not attempt to deal with potential impacts and impact significance. There were few cases where the specialist would actually become part of the assessment and use his or her knowledge in the identification and prediction of impacts. Generally the assessment co-ordinator simply took the specialists' report and would attempt to identify impacts and predict impact magnitude in isolation. This individualist style of working goes against best practice within environmental impact assessment where it is considered that best results stem from an integrated, multidisciplinary team in order to have sufficient knowledge to adequately identify and assess potential impacts (O'Riordan and Hey, 1976 and Morris and Therivel, 1995).

When asked to rate their most recent environmental statement 20% of respondents considered their last environmental statement to be not at all useful or of limited use for decision makers. This adds weight to the argument that environmental impact assessment within the sector is in a downward spiral if elements within both the competent authority and practitioners consider the process to be of little value for those planning the afforestation proposal and result in little information which is of use to the decision makers. The temptation will be to prepare low quality assessments if it is felt that there is no real justification of the need for assessment in the first place, and ultimately, the competent authority are not too concerned about the quality, merely that some form of assessment is seen to be carried out. It should be noted however that in common with the screening and scoping stages the Forestry Commission has initiated an increase in the scrutiny of environmental statements prior to them being accepted as a useful introduction to the decision making process. Since 1996 the researcher was contracted by the

Forestry Commission to carry out the review of submitted environmental statements following on from the earlier work (Gray, 1996 and Gray and Edwards-Jones, 1999). This was the first time that environmental statements were subject to third party review within the sector and has led to a number of environmental statements being returned to their authors for amendment before acceptance into the decision making process. None of the environmental statements reviewed for this research reported here were included in this contract review work.

Looking at the costs of environmental impact assessments Clark (1984), Hart (1984) and Wathern (1988) estimate that across all sectors the costs of conducting an assessment is in the region of 0.5% to 2% of project value, Coles, Fuller and Slater (1992) suggested a wider range of 0.000025% to 5% based on UK environmental statements. The World Bank (1989) suggests a range of 5 to 10%. Jones, Wood and Dipper (1998) provide a cost range of £10,000 to £100,000. Within the forest sector a quick method of estimating the value of a project is to calculate the sum of grant aid available. If one considers the average sized afforestation proposal called for assessment during the period 1988 to 1998, a scheme of some 413 ha in extent would attract Woodland Grant Scheme establishment grant aid in the region of £294,000 (using grant aid rates as of 1998) without any additional supplements for better land, community woodlands or locational challenge funds. Using Coles' *et al.* (1992) estimate of assessment costs this gives an upper limit of approximately £15,000 for the average scheme. The highest figure expressed by respondents for an individual assessment was £40,000. If one takes this as the top range and uses a weighted average of the median values expressed within Question 10 this gives a weighted average cost of approximately £12,000, or 4% of grant aid which falls within Coles' *et al.* (1992) estimate. This is approximately half the value of Weston's (1995) estimate of £28,880 but within the range of £10,000 to £250,000 and the range of Jones *et al.* (1998).

The final question within the practitioners' questionnaire asked how useful the process as a whole was considered as a method of environmental protection. There was a recurring comment that there are already sufficient safeguards within the regular Woodland Grant Scheme application procedures and that the Forestry Commission called too many projects for assessment without good reason. Where responses were given that the process was useful or very useful as a method of environmental protection, this was qualified by comments that it was only so in a very few cases and that in the main the process was generally a waste of effort for all parties involved and in many cases the assessment was carried out because it had to be seen to be carried out. Within the general comments respondents suggested that in highly contentious cases the process would be useful but the potential is more often than not lost as the project does not really require it in the first place and consultees misuse the process by

introducing new issues at a late stage in the process. Respondents also commented that the process could be useful if scoping was carried out properly and that effort was not wasted on collecting information which was not really required. These comments suggest that at least some proponents are aware of the value of scoping and the need to focus attention on only the most crucial of issues during the assessment. If this is the case it is a matter of concern that the review of sector environmental statements should highlight the general lack of scoping and the repeated coverage of unnecessary issues. If practitioners are aware of bad practice and understand the methods through which improvements can be achieved one may question why this has not been implemented. This may suggest that practitioners are unaware of their 'rights' as one of the key players within the process and are still willing to allow the Forestry Commission to take the lead (in theory) and suggest how the assessment should be conducted rather than drive the process forwards themselves. This may be due in part to the fact that very few of the practitioners have any experience of environmental impact assessment outwith the forest sector and are therefore unaware of the standards of best practice and procedures which are employed elsewhere. This shows similarities with Weston's (1995) questionnaire responses where 25% felt that than no or few improvements were gained in environmental protection.

5.4.5.3 Consultees

5.4.5.3.1 Experience of Environmental Impact Assessment

The results of the questionnaire show that the major consultees such as Scottish Natural Heritage, local authorities and the Scottish Environment Protection Agency have considerable environmental impact assessment experience in both the forest and non-forest sectors. In addition although while not a statutory consultee the Royal Society for the Protection of Birds has experience of many environmental impact assessments from a wide range of projects types. In the north of Scotland the RSPB was involved in at least 20 environmental impact assessments annually from a wide range of sectors.

Table 18. Consultee questionnaire responses.

Question 1 How many EIAs have you been involved with?	% Forest Sector	% Non forest sector
0-2	22	14
3-5	28	22
6-9	17	14
10+	33	50
Question 2 How frequently does the Forestry Commission consult you on the screening of projects?		%
Never		0
Rarely		17
Frequently		61
Always		22

Question 3 How frequently are you asked to participate in a scoping exercise?	%
Never	0
Rarely	22
Frequently	50
Always	28
Comments: Always consulted as far as I am aware [C3, C6] Frequently, but I don't know how many I have missed [C11] Scoping is the most important stage [C2, C4, C9, C11, C13, C16]	

Question 4 Do you use any tools to aid scoping (e.g. matrices, checklists)?	%
Yes	50
No	50

Question 5
How often are you asked to advise on the following?

	Baseline data requirements	Prediction and assessment of impacts	Thresholds of concern	Methods of mitigation
	%	%	%	%
Never	11	17	17	11
Rarely	17	22	11	17
Frequently	44	17	39	33
Always	28	44	33	39

Question 6 Do you consider that your specific concerns are included in assessment?	%
Never	0
Rarely	11
Frequently	61
Always	28
Comments: Most issues adequately treated but impacts on trophic levels ignored [C5, C6] Assessment only adequate due to DCS drafting sections of interest [C16] Most impacts treated very superficially or subjectively [C17, C18] Standard of impact assessment very variable but usually inadequate [C4, C7, C9]	

Question 7 Do you consider that ESs adequately assess those impacts you consider to be potentially significant?	%
Never	0
Rarely	17
Frequently	67
Always	17

Question 8 How useful do you see EIA as an aid to decision making?	%
Not at all useful	0
Of limited use	6
Useful	50
Very useful	44
Comments: If carried out well it could be an excellent aid [C2, C4, C11, C12] Often very poor in practice [C4, C6, C7, C9, C13, C16, C17]	

Question 9 How useful do you see EIA as a method of environmental protection?	%
Not at all useful	0
Of limited use	5
Useful	67
Very useful	28

Comments: If acted upon and not just treated as a bureaucratic process [C4] Appears to give sound level of protection [C5] Variable depending on the nature of the environmental interest [C1, C11, C12] A clear environmental impact assessment allows a holistic view to be taken [C8] A cumbersome process [C1] Assessments are not independent and therefore often biased [C7, C10, C18 Not enough environmental impact assessments called [C17] Too many environmental impact assessments called [C1, C14] Most environmental statements are merely a cursory run-through by un-qualified personnel [C18] Real assessment of impact is rare [C4, C9, C17, C18]	
Question 10 If you deal with EIAs from other sectors how do they compare with forest sector EIAs in terms of rigour of assessment?	%
Better	34
About the same	53
Worse	13
Comments: Usually better due to consultation, site understanding, more rigorous approach [C1, C7, C8, C18] Forestry environmental impact assessments have improved but still have a long way to go [C9] There is a lack of public involvement [C10]	
General Comments: One often encounters the playing down of impacts between the specialist's report and the environmental statement's text [C3] More training is required for forestry consultants and managers [C9]	

[C] – Consultee Number

5.4.5.3.2 Involvement in the Screening of Proposals

While 83% of respondents considered that they were frequently or always consulted by the Forestry Commission on the screening of projects, differences could be noted both between conservancies and individual consultees. For example the RSPB considered they were always or frequently consulted in all conservancies except for Grampian and Lothian. This situation was also noted with SEPA in Dumfries conservancy. The figures present a different division with those from the Forestry Commission staff, none of whom declared that consultees were always consulted during the screening of projects. As discussed earlier, with many of the UK's 2000 annual Woodland Grant Scheme applications, with an average size of approximately 7 ha the potential impacts from these proposals can often be readily assessed by the Forestry Commission field staff and referral to consultees would merely provide unnecessary bureaucracy and cause additional strain on the already stretched resources of both the Forestry Commission and the consultees. It is interesting that almost a quarter of consultees do believe that they are always consulted during the screening stage. While the responses from the Forestry Commission staff and the consultees display a degree of difference it should be minded that the sample size of the Forestry Commission staff was small and restricted to two conservancies. Responses were received from consultees who are engaged with all of the Scottish conservancies.

5.4.5.3.3 Involvement in the Scoping of Environmental Impact Assessments

A similar difference between the responses of Forestry Commission staff and the consultees exists within responses for participation within the scoping phase of assessments. While 17% of Forestry Commission staff responded that consultees were rarely included and 83% frequently included, none of the Forestry Commission responses suggested that consultees were always involved in scoping. However over one quarter of consultee respondents considered that they were always asked to participate with scoping. Interestingly within SNH there was considerable variability within different parts of Scotland returning always/frequently/rarely responses. In addition there was no set pattern among the statutory consultees for participation in scoping. While screening and scoping may be thought to be closely related it was noticed that within SNH, in the south west the respondent considered to be involved in screening frequently and scoping always. In the south east the SNH respondent considered to be consulted frequently within screening but rarely in scoping. Again while comparison of the figures from Forestry Commission staff and consultees suggests some difference in the way the two groups feel the process is being administered caution should be used during discussion due to the difference between the two sample sets. Comparing the figures from practitioners with those from consultees, while all practitioners claimed that SNH was always involved within scoping only one out of the five SNH responses felt they were always involved with the four others evenly divided between rarely and frequently involved. Similarly while 79% of practitioners claimed to involve the RSPB in the scoping phase two responses claimed to be rarely involved and three to be frequently involved within the scoping of assessments. While the uneven coverage of responses across Scotland may be the reason for part of this difference, there is some divergence of opinion between the three parties as to how often they are engaged within two of the most vital parts of a successful environmental impact assessment process, the screening and scoping of projects.

5.4.5.3.4 The Use of Tools

The use of tools to assist scoping followed a similar pattern to those responses from Forestry Commission staff and practitioners. While responses from consultees indicated the highest use of tools, there was an even break between those who used tools and those who did not. Similar to Forestry Commission staff and practitioners, the suite of tools described was limited to only the most basic. While the use of maps was commonplace none of the respondents mentioned the use of matrices. Respondents from SNH mentioned the use of internal guidance notes, however this was not uniformly confirmed throughout SNH. The use of the forest sector environmental impact assessment regulations was commonly noted as a scoping tool. The inclusion of this by respondents is interesting as the guidelines do not give any indication of how scoping should be carried out but merely provides a list of potential receiving

environmental elements. While such a list may be useful at a very basic level as an elementary checklist, the broad nature of the receiving environmental elements would limit the use of such a checklist on a site specific basis. Use of crude checklists would suggest that consultees are generally limiting their scoping to broad elements such as fauna or flora or water. If during scoping the practitioners are asked to carry out assessment on such broad elements such as these, it is easily seen why the resulting assessments and environmental statements are unfocused and lacking any depth of analysis. Although as discussed earlier the Forestry Commission has begun to initiate steps to improve the scoping phase, the results from the three questionnaires provide an insight to the reasons for the results of the review of sector environmental statements highlighting the repeated ineffectual scoping of assessments.

5.4.5.3.5 Provision of Information

In addition to identifying which issues should be focused upon during the assessment, a major role for the scoping phase can be to provide a forum through which the parties can discuss the practicalities of carrying out the assessment. Issues such as disagreements over baseline survey methods, techniques used for predicting impacts and the setting of thresholds of concern can generally be avoided if discussed at an early stage in the assessment. If all parties are aware of how the assessment is going to be carried out there will be reduced risk of the results of the assessment being contested due to perceived irregularities such as sampling methods for example. Within the assessment process in the forest sector many of the consultees involved are the accepted leading experts in their particular field. This is particularly the case of SNH, the RSPB and SEPA within Scotland. Both SNH and SEPA are statutory consultees and therefore have statutory requirements to assist in the assessment process. As the recognised experts who are already engaged in the scoping process it would be reasonable to assume that this body of expertise would be regularly used in an advisory capacity. For all of the four sections, baseline data, prediction and assessment of impacts, thresholds of concern and mitigation between 61% and 72% of respondents stated that they were asked to give advice frequently or always. The results of the review of forest sector environmental statements suggest that while baseline data was provided in some form and discussion of methods of mitigation were found to be included in the majority of cases, very few made specific reference to input from consultees on data requirements or potential methods of mitigation. While consultees may have been asked to advise on prediction and evaluation of impacts and thresholds of concern, the review of forest sector environmental statements highlighted the infrequency of attempts to make quantified predictions or state what threshold of concern was used to determine impact significance.

5.4.5.3.6 The Content and Quality of Environmental Impact Assessments

Questions 6 and 7 attempted to investigate whether or not those issues considered by the

consultees to warrant assessment, were actually included, and where they were included whether or not the assessment had been considered as satisfactory. The responses suggest that 89% considered their concerns to be frequently or always included, and 84% considered that the assessment was frequently or always adequate. This response offers a different perspective to that resulting from the review of forest sector environmental statements and responses from the other two questionnaire groups. Within the review it was noted that while most environmental statements included reference to a wide range of environmental elements the ensuing assessment was neither specific enough nor sufficiently rigorous to be considered adequate. In most cases no quantified assessment was undertaken. Hence two possible situations may exist, firstly that the consultees are not fully aware of the requirements of assessment. It would however be unusual for bodies which are dealing with large numbers of environmental impact assessments from a range of sectors such as SNH, SEPA or the RSPB to be lacking awareness of the requirements of assessment. The alternative scenario is that there was actually no potentially significant impact and the issue should have been screened or scoped out, however the decision to carry out the assessment had been made by the Forestry Commission and had to be completed, therefore a superficial attempt at assessment was sufficient with minimal input from the consultees.

The penultimate question within the questionnaire attempted to gauge consultees' view of the usefulness of the assessment process as a whole. While over 90% of respondents considered environmental impact assessment to be frequently or always useful as an aid to decision making this response should be viewed in conjunction with the range of comments supplied by respondents. There were a number of comments suggesting that although the process of environmental impact assessment has the potential to be useful in ideal circumstances, the reality is that the standard of assessment is rarely adequate and often biased in nature and therefore of little value. There were also two respondents who believed that the process was providing a sound level of environmental protection. There was also a divergence of opinion over the level of assessment activity where two respondents suggested that too many assessments were being called and one respondent suggested too few were being called. The latter respondent also commented that forest sector assessments are often found to be of very poor standard and that adequate assessment of impacts was rare within environmental statements.

The results from the review of sector environmental statements suggested that the number of assessments being called was indeed too high and that this high number is one of the causes of the poor standard of assessment. It is suggested that improvements in screening should focus attention on only those projects with potentially significant adverse impacts. The preparation of

many assessments where they are really not required has only led to the dilution of the role and function of environmental impact assessment within the forest sector. Rather than being a process which is implemented in a limited number of cases for special circumstances and there being some status attached to the standards of investigation within the assessment, the requirement for assessment is now all too often common in circumstances which do not merit this level of scrutiny. The fact that most of the parties involved are aware of this 'over assessment' therefore allow poor quality assessment to prevail. While the completion of assessments in cases of false positive screening force proponents to incur unnecessary costs, in the case of true positive screening cases, the now reduced acceptable standard of assessment may result in a reduction in the process' ability to act as an effective method of environmental protection.

The final question aimed to gain an understanding of how respondents gauged forest sector environmental impact assessments in comparison with assessments from other sectors. While over half of respondents suggested that the rigour of assessment was of similar quality, a third of respondents believed that forest sector assessments compared favourably with those from other sectors. It is however useful to note that these respondents also commented on the poor quality and superficial appraisal of impacts within the forest sector. Also it is useful to note that those respondents who considered forest sector environmental statements to be of higher quality that non-forest sector environmental statements were restricted to those who had experience of less than five non-forest sector environmental statements. Respondents with substantial experience of non-forest sector environmental statements considered forest sector assessments to be comparable or compared less favourably. This view concurs with the results of the review of forest sector environmental statements when compared with the results from review in other sectors (Wood *et al.*, 1991, Lee and Dancey, 1993, McGrath and Bond, 1997).

5.5 Chapter Summary

The Forestry Commission does not have a formalised or systematic process for screening projects for the need for environmental impact assessment. In addition the absence of the recording of the reasons for these determinations means that normal audit techniques are not applicable. While there are large numbers of assessments being called the number of impacts being determined as significant within the resulting environmental statements is very low, and the number of projects rejected following assessment remains at only one. However as discussed in Chapter 3 the majority of projects called for assessment are materially modified following assessment although the environmental statement may not identify any significant impacts. In these cases one must assume the projects did in fact contain significant impacts (otherwise the project could have proceeded unchanged), and that the Forestry Commission was

correct in its screening decision, but failed to adequately review the quality and content of the environmental statement. However there are also cases in which an assessment has been called by the Forestry Commission despite the statutory consultees raising no issues and openly supporting a project. Further, the environmental statements arising from these projects identify no significant issues. Examination of the five screening scenarios in light of the results of Chapters 3 and 4 suggests the ability of the Forestry Commission to accurately identify potentially damaging projects cannot be assumed to be wholly effective. While the Forestry Commission may be able to identify potentially damaging projects its ability to separate these from projects with similar project design characteristics but without potentially damaging effects is questionable. This results in an incidence of false positive screening determinations.

The results of the screening case studies, while necessarily modified from its original format due to the limited number of responses from Forestry Commission staff, provides an interesting insight into the screening of proposals by Forestry Commission staff. The Forestry Commission staff unanimously correctly screened the false positive case, which does not concur with the Forestry Commission making incorrect false positive screening determinations. A majority of over 70% correctly screened the true positive case. However the true negative and false negative cases were incorrectly screened by a majority of over 70% of Forestry Commission staff. This would suggest that the possibility exists that cases with potentially damaging impacts could proceed without assessment, and cases without potentially damaging impacts could be called for assessment unnecessarily. In comparison, while the MSc students were unable to make a unanimous screening decision, they were able to correctly screen three out of the four cases with majorities of up to 90%. There was no correlation between experience of the assessment process and screening results within the Forestry Commission staff. Although the sample size was small it does represent 10% of the Scottish conservancy staff handling environmental impact assessments. The overall results suggest that there is no difference in the ability of the two groups to correctly screen afforestation projects.

The questionnaires highlighted differences between the three parties in terms of involvement within the assessment process and its value. The value of scoping was questioned by almost one fifth of Forestry Commission staff, and the responsibility for carrying out scoping was confused with some practitioners suggesting that the Forestry Commission carry out scoping on their behalf. The knowledge of and use of tools was found to be low in all three groups, in particular in Forestry Commission staff where only a small minority of respondents claimed to make use of tools. The value of environmental impact assessment was seen differently by the three groups. While Forestry Commission staff and practitioners showed general mistrust or caution in using the assessment process, among consultees the assessment process was seen more

favourably with the majority believing that environmental impact assessment is a useful aid to decision makers and regarding the assessment process as a useful or very useful aid to environmental protection. Interestingly one fifth of practitioners claimed that their most recent environmental statement was not useful at all or of limited use in providing decision makers with information. Responses from practitioners indicated that over one third had withdrawn projects following it being called for assessment and that the average cost of carrying out an environmental impact assessment was £12,000. While the questionnaire responses include some positive aspects the overall impression is of a process which is mistrusted or misunderstood by two of the three main actor groups.

CHAPTER 6 STANDARDS OF ASSESSMENT

6.1 Introduction

The review of forest sector environmental statements in Chapter 4 highlighted the general poor quality of assessment throughout the sample of 89 environmental statements reviewed. A series of common failures were found to be almost universally present resulting in the low review grading of the environmental statements. In particular, the chain of information collection, analysis and interpretation was very poor. Since this process lies at the heart of assessment the usefulness of the resultant environmental impact assessment as a meaningful and trustworthy introduction to the decision making process may be in doubt. The wariness of Forestry Commission staff and consultees noted in Chapter 5 over accepting the results of forest sector environmental impact assessments strengthens this argument. Without adequate and acceptable handling of information the environmental impact assessment is likely to fail to perform adequately as an aid to decision-making or as a means of environmental protection.

As stated in Chapter 5, it was originally planned to investigate both the adequacy of the Forestry Commission's screening process and the accuracy of the ensuing environmental impact assessment through the audit of a sample of projects. This comparison of predictions made in the assessment with actual outcomes, would allow investigation of whether or not screening had successfully identified projects containing potentially significant adverse impacts, and whether or not the predictions and claims of the assessment were correct. However, the paucity of baseline data, open methods of prediction and definitive statements on impact significance for all but a very few individual environmental elements has meant that this approach was impossible. It was therefore necessary to split the investigation of the effectiveness of screening and the adequacy of assessment into two separate tasks. The investigation of screening was contained in Chapter 5.

Within this chapter the assessments carried out in five environmental statements on two environmental elements, landscape and employment, are critically examined. This examination focuses on the adequacy of the three-part assessment process; baseline information, impact prediction and determination of significance. The results and methods used within the environmental statements are then used to complete an audit of the assessment findings, in particular, focusing on determination of impact significance. Due to the shortcomings of the original assessments contained in the environmental assessments, parallel assessments are carried out using the original baseline data. This includes the results of two surveys on public attitudes to potential impacts on landscape and employment due to afforestation projects.

6.2 The Assessment of Impacts in Forest Sector Environmental Impact Assessments

6.2.1 The Need to Examine the Standard of Assessment in Individual Environmental Impact Assessments

The review of environmental statements in Chapter 4 found that only a very small number of potential impacts were considered to have been assessed in a manner which incorporated sufficient baseline data, and used verifiable methods of impact prediction and determination of impact significance. It was therefore felt appropriate to use these individual elements of assessment as the basis for an investigation into the satiety of assessment. The majority of reviewed environmental statements contained insufficient quality or quantity of baseline data to permit auditing. In these cases there is therefore no possibility of re-assessing the impact and determining whether or not the original assessment finding was correct. The review of environmental statements identified only two elements for which the assessment process was considered to be approaching an acceptable standard in a small number of individual assessments. These elements were the potential impact on employment and landscape. It should be remembered however that in the majority of cases the standard of assessment for these elements was also considered to be below an acceptable standard, in common with the remainder of the customary suite of environmental elements investigated.

The investigation into the adequacy of assessment can be considered as having two parts. The first is the straightforward audit of the end statements and whether the actual impact agrees with the prediction. If the actual recorded impact concurs with the prediction contained within the environmental statement then the assessment can be considered to have been correct. However, the shortcoming of using this approach alone does not account for the possibility that one could reach the 'correct' assessment outcome, but through an incorrect or unreliable method. The second part of the audit therefore considers the mechanism or the component parts of the assessment. Where an adequate assessment has originally been carried out this involves the re-measurement of the environmental element and the comparison of this level with the threshold of concern initially used and the findings included in the original environmental statement. In theory one can then easily state whether or not the actual impact of the project is significant or non-significant and identify the magnitude of the difference between the predicted and actual impacts. If the predicted and actual outcomes are different one can then attempt to identify where the cause of the anomaly lies. This could be within one of three areas in the assessment; inaccurate baseline data, unsuitable predictive methods, or inappropriate determination of significance. Auditing studies such as Beanlands and Duinker (1983), Berkes (1988), Buckley (1991), Mills (1992), Arts (1998), Mwalyosi and Hughes (1998) Dipper, Jones and Wood (1998), Chadwick and Glasson (1999), Wood, Dipper and Jones (2000) and Wood (2000) have repeatedly found weaknesses in the precision and accuracy of predictions in environmental

impact assessments.

The review in Chapter 4, highlighted the fact that only in occasional cases was information included in the environmental statements on the methods of data collection, the models used and assumptions made during prediction of future environmental element levels, or the mechanism through which significance or non-significance of impacts was determined. Unfortunately, cases which provided such data did not coincide with those containing auditable results. Where it is not possible to compare actual effect against the original threshold of concern it is therefore necessary to re-assess the potential element using the existing baseline data and a verifiable assessment technique in a parallel assessment. It is impossible to obtain new baseline data since in these cases the baseline would have been altered by the project. One is therefore obliged to use these data but one should be aware of the limitations of use where no verification of the accuracy of the data can be obtained.

6.3 Methodology

Of major importance in an acceptable environmental statement is the presence of three elements within the assessment process, namely the provision of baseline data, the prediction of future environmental parameters in an open manner, and the explicit determination of impact significance together with the manner through which the determination has been made. The review of sector environmental statements highlighted the low frequency of environmental statements in which the assessment of impacts contained these three process elements at a standard which was considered adequate. In the majority of cases reviewed, it was found that none of the environmental elements purportedly assessed could be considered to have this three-part process adequately carried out. Within the minority of cases which included the three-part process, one or more of the component parts was found to be inadequately completed. Further, the review found that only a very limited number of individual elements (rather than whole environmental statements) contained sufficient baseline data, information on predictions and methodologies, or definitive and open determination of significance of a standard which would be acceptable to make subsequent audit of the process possible.

Throughout this part of the research the methods developed by Wilson (1998) have been adopted. Rather than carrying out a scientific audit of impact predictions, the 'predictions-forward' audit, which is seen as over complex and too demanding in light of the results of the review; it will merely focus on whether predictions match outcomes. The implementation of 'predictions-forward' audits is not the main objective of this research. The audit is therefore based on readily made observations, rather than the setting up of complex experimental

protocols. During the review process a record was maintained of those environmental statements within which at least one of the three components of assessment had been adequately presented for one or more environmental elements. The initial methodology was to carry out the audit of a sample of entire environmental statements. Due to the paucity and general poor standard of information provided in the environmental statements reviewed, the audit was amended to be focused onto the small number of individual elements which contained sufficient information to allow audit to take place. The environmental elements for which the largest number of environmental statements contained auditable information were landscape and employment. For each of these elements it was decided to audit three cases. A list of nine environmental statements with auditable information for the two environmental elements was collated, from which five environmental statements were selected for auditing. The list of selected environmental statements is given in Table 19.

While the provision of baseline data was frequent for elements such as flora and fauna, this was often of limited use in the assessment process. Merely noting that a number of individuals of a species of bird were seen on a particular site visit is of little use as an aid to decision making or for the purposes of this research, the assessment should then have translated this raw bird count into an estimate of the total population affected by the proposed afforestation scheme. None of the environmental statements reviewed contained adequate coverage of the second and third components of the assessment process for flora or fauna environmental elements.

Table 19. Environmental statements included in the audit procedure.

Scheme/ Environmental Statement	Conservancy	Landscape	Employment
Beinn Leamhain	Highland		✓
Cornharrow Partial Afforestation Scheme	South west	✓	✓
Forest Farm Estate	Highland	✓	
Hill of Foudland	Grampian	✓	
Mitchellslacks & Locherben Afforestation Proposal	South west		✓

For each of the above environmental statements an extract of the information presented for each of the relevant environmental elements has been prepared and is appended in Appendix 4.1. From the extracts it is then possible to isolate the baseline data, the prediction offuture element levels and the approach to the determination of significance. The analysis of the assessment techniques used has four distinct phases:

- For each element the assessment approach is critically reviewed;
- Where the techniques used in the original assessment are considered to be inadequate, a

parallel assessment is conducted utilising the available baseline information using verifiable methodologies and techniques;

- Measurement of the actual effects of the project to allow comparison with the original assessment findings;
- The assessment of significance in both the original environmental statement (the parallel assessment) and the actual measured outcomes.

6.4 Examination of the Original Assessments

The adequacy of the assessment presented for potential impact on each of the environmental elements within the sub-sample of environmental statements is critically reviewed below. This review focuses on the adequacy of the three-part assessment process; the adequacy of baseline information, the prediction of levels of effect and the determination of impact significance.

6.4.1 Critique of the Assessment of Impact on Landscape in Three Forest Sector Assessments

Looking firstly at provision of baseline data the Hill of Foudland (Appendix 4.1.1), Forest Farms Estate (Appendix 4.1.3) and Cornharrow Partial Afforestation Scheme (Appendix 4.1.2), all environmental statements provided background information on landform and presented details of local land use, albeit in general terms. The Cornharrow environmental statement, for example, stated that the area was part of an ESA but gave little information on what restrictions this may present to landscape issues. All three environmental statements provided information on the project, however the main operations and work practices were dealt with in general terms rather than focusing attention on the pertinent issues in a landscape sense. Thus, in the Cornharrow environmental statement it was noted that ground preparation methods were selected to suit soil conditions. No mention was made later in the environmental statement about possible deviation from this prescription due to attempts to lessen impact in certain areas.

In all three environmental statements the three part assessment process was somewhat truncated, with none of the three cases satisfactorily completing the process. All three provided visual baseline data in the form of photomontages. In the Cornharrow environmental statement these were appended within a twenty-page landscape assessment, the Hill of Foudland environmental statement contained twenty photomontages and sketches and the Forest Farms Estate environmental statement had a second volume devoted solely to photomontages. The Cornharrow and Forest Farms environmental statements then presented future impressions of the views selected using hand drawn overlays. The Hill of Foudland environmental statement had a series of artist's impressions showing future views. It should be noted that all three presented future impressions of mature woodland. None of the environmental statements gave

any consideration to landscape impact in the short to medium term, where impact from ground preparation techniques is going to be most obvious.

However, none of the environmental statements made any attempt to carry out an open determination of the significance of the impact on landscape. In all three environmental statements the determination of significance was presumably the judgement of the environmental statement author alone, there being no evidence of anyone else being involved in the process. With no methodology provided in any of the cases, verification of the validity of the judgement was therefore impossible. Given that all three environmental statement authors in their respective cases were also main actors in the formulation of the afforestation proposal and the Woodland Grant Scheme and its design, their impartiality in reaching a conclusion that the forest design is of high standard and presents minimal impact on the landscape may be open to question. Statements such as "the woodland boundaries chosen present the optimum compromise to enable the proposals to contribute successfully to their surroundings" within the Hill of Foudland environmental statement suggested that there is no reasonable alternative and that the design in question had been proven to be the one of choice.

However the absence of alternative designs and the non-disclosure of the methodologies through which the suitability of the design had been measured, leaves claims such as the above without foundation. Further, none of the environmental statement authors professed any formal qualification, training or specialised experience in landscape design. The interpretation of landscape and impacts on landscape of proposals is a highly specialised skill. It goes against the ethos of environmental impact assessment for a lone individual to carry out an assessment particularly without details of the method of evaluation. Best practice suggests that experts should be used where possible to provide specialised knowledge within their sphere of excellence. Hence, although the *ex-ante* and *ex-post* visual representations have been presented, the reader was not furnished with the methodology through which the determination of impact significance had been made. The reader was therefore unable to verify whether or not this methodology was acceptable. The determination of the significance of the impact on landscape was somewhat nebulous, perhaps due to the fact that indeed no methodology had been used and it was purely one individual's subjective decision. The Cornharrow environmental statement gave very little detail in the main text, directing the reader to the appended landscape assessment which identified viewpoints and factors affecting landscape design and gave broad methods for incorporating these into the design. However the landscape assessment itself did not make any determination of impact significance. It merely described the factors that were taken into consideration when the original Woodland Grant Scheme was drawn up. The main text of the Cornharrow environmental statement did not provide a clear

determination on impact significance, referring the reader again to the landscape assessment. The final conclusion of the Cornharrow environmental statement stated that "landscape and conservation embrace the most significant effects of the proposal. These headings require consideration of the impacts of the proposal" and later "the forest would be highly visible to walkers from vantage points on or near the Southern Upland Way and has been designed to reflect the landform of the property and tie in with adjacent forest areas". It was therefore somewhat unclear whether or not a significant impact has actually been determined.

The language used in the Hill of Foudland and Forest Farm Estate environmental statements is similarly indistinct, and the crucial term, 'significant impact', loosely applied. Within the section titled "Significant Environmental Effects of the Proposals Plus Mitigation Measures Adopted", the Hill of Foudland environmental statement stated that "the negative impact of the new woodland ...the 'plantation effect' is unavoidable" but followed on to say "design plans resolve to minimise this adverse impact as much as possible." It was thus unclear whether the environmental statement had found the resulting impact to be significant or non-significant. Similarly, within the section titled "Potentially Significant Environmental Effects" the Forest Farm Estate environmental statement stated "the most significant effect on the landscape in the longer term will be the growth of the woodland. This impact will be positively beneficial in the longer term." This was merely the opinion of the environmental statement author and was not supported by corroborating evidence.

The inclusion of methods of mitigation in the Hill of Foudland and Forest Farm Estate environmental statements suggested that the impacts identified were indeed considered as significant, as it would be unnecessary to mitigate impacts which were not considered to be significant. The effect of the proposal would be already acceptable or tolerable. However in the Hill of Foudland and Forest Farm Estate environmental statements the methods of mitigation were presented without any evidence corroborating their efficacy, for example, a post-mitigation reworking of the viewpoint photomontages or sketches. One is therefore unable to assess whether or not these methods would indeed perform satisfactorily. Also, none of the environmental statements made any reference to the level of residual impact, merely implying that all contentious issues would be adequately covered by the incorporation of the unverified mitigation methods.

The methods of mitigation proposed in the Hill of Foudland and Forest Farm Estate environmental statements are themselves somewhat unusual and show similarities with the basic project design information previously discussed in the environmental statement. Methods

of mitigation are generally considered to be specific changes or additions to project design or work methods introduced following determination of a significant impact. The mitigation methods in the Hill of Foudland and Forest Farm Estate environmental statements were not additional works or changes but the re-statement of techniques already given in the original design methodology. Thus the Hill of Foudland environmental statement included "sensitive woodland design and retention of open space", unaltered from the section on project description, as a method of mitigation. The Forest Farm Estate environmental statement included general terms such as limiting drainage and ground preparation, choosing fence lines, varying planting spacing and "having due regard for the existing landform" as methods of mitigation despite these being previously described within the "Description of the Afforestation Project". None of the three environmental statements contained pre-mitigation and post-mitigation maps or photomontages. It was therefore impossible to identify what if anything had changed through the employment of mitigation methods. If these methods of mitigation do not alter the project design in any form, one must therefore question their efficacy and need. It could be asked whether or not there actually was a significant impact which required mitigating. Again, this uncertainty was directly attributable to the incomplete treatment of the three-part assessment process.

6.4.2 Critique of the Assessment of Impact on Employment in Three Forest Sector Assessments

The assessment of potential impact on employment due to afforestation proposals was examined within the environmental statements for the Mitchellslacks & Locherben Afforestation Proposal (Appendix 4.1.5), Beinn Leamhain (Appendix 4.1.1) and the Cornharrow Partial Afforestation Scheme (Appendix 4.1.2). All three of the environmental statements presented information on current without-project employment levels although the Mitchellslacks & Locherben environmental statement failed to quantify and incorporate employment details of "extra help during busy handling times". In addition all three of the environmental statements provided predictions of the future with-project employment levels. The three environmental statements provided basic information on the afforestation proposal from which it was possible to make estimates of the employment patterns of the proposals for the ensuing 40 to 50 years. In particular the Mitchellslacks & Locherben and Cornharrow environmental statements provided detailed breakdown of predicted employment arising from the proposals over one rotation of the timber crop. The Beinn Leamhain environmental statement provided less detailed information, restricted to the initial ten-year period. However the method through which these employment predictions had been calculated is not disclosed within the Mitchellslacks & Locherben and Beinn Leamhain environmental statements, while the Cornharrow predictions were "worked up from principles using the writer's experience of outputs for various operations".

The reader had no method of quickly verifying the appropriateness of the figures presented. It should be borne in mind that in this respect existing baseline and future employment predictions included in the Cornharrow and Mitchellslacks & Locherben environmental statements were perhaps the clearest and most complete evaluations of the without-project and with-project conditions for any element found in any of the 89 environmental statements reviewed within this research. Despite this provision of quantified (albeit uncorroborated) information the assessment of potential impact on employment by the proposals was far from complete in all three environmental statements. Each of the environmental statements compared existing employment with future predictions. However no allowance was made in any of the three environmental statements that much of the afforestation derived labour will be temporary and episodic in nature. Hence full time existing employment in agriculture was not directly comparable with periodic part time employment derived from the afforestation proposal. Further, although the Cornharrow and Mitchellslacks & Locherben figures suggested harvesting will be carried out by motor-manual methods it is likely that given the trend towards mechanised harvesting seen in recent years first thinning in particular and subsequent felling operations would be carried out using mechanised methods. This would not only result in altered employment levels for harvesting operations but also where such contract staff can be sourced. Given that all three of the proposals were relatively small, harvesting work on these sites would constitute only a small part of the annual work programme for a mechanised harvester/forwarder team. Contract staff are transient and therefore may not be residents of the immediate locality. Although research has shown that 60% of contractors work within 20 miles of their residence (FIC, 1998), the need for the use of specialised equipment often requires harvesting contractors to work over a much wider range. This is distinct from the existing situation where all those employed in the agricultural enterprises resided on-site.

The Beinn Leamhain environmental statement stated that "employment will be somewhat enhanced" but did not make a definite determination of impact significance. Similarly the Mitchellslacks & Locherben and Cornharrow environmental statements failed to give a clear determination of impact significance. However, both included the effect within sections of the environmental statements concerned with significant impacts. This failure to make it clear whether the potential impact had been assessed as significant or non-significant was due to the incomplete assessment protocol. In addition the mechanism through which the (incomplete) determination of impact significance had been made was not included in any of the three environmental statements. In particular the setting of a threshold of concern was absent in all three cases. One was therefore unable to verify whether this determination of significance was satisfactory. In all three cases this determination would appear to be the subjective judgement of the environmental statement author alone.

Hence in the case of the Cornharrow environmental statement employment was predicted to rise from one permanent position to an average of two over one crop rotation, although the environmental statement did not make any distinction between permanent employment and full time equivalents (FTE). Taken at a simplistic level this does equate to a 100% increase in employment. Within the assessment of other elements, changes in baseline levels of this magnitude may well be correctly determined to be significant impacts. However the simple comparison of full time and FTE positions does not evaluate similar entities. Also the comparison of with-project and without-project figures in the determination of impact significance (albeit in the absence of a stated threshold of concern) must be made within context. Hence, focusing on the change in employment restricted to the project site gives a somewhat limited perspective. A much more complete determination of significance would be obtained by the setting of threshold of concerns in relation to the size of the local working population and the levels of unemployment in the local areas. Viewed in the restricted context of the project site a 100% increase in employment may well exceed a threshold of concern and therefore be regarded as a significant impact. However, when viewed in a realistic perspective the creation of a single additional FTE position within an available workforce of many hundreds is a very different situation.

6.5 Re-examination of Impacts – The Parallel Assessment

6.5.1 The Need to Carry Out a Parallel Assessment

As discussed earlier the original intention with this part of the research was to carry out an audit of a number of environmental statements, comparing predictions made within the assessments with actual outcomes. During the course of the review of forest sector environmental statements it became clear that major deficiencies in the presentation of information and the assessment of impacts would render the audit of whole environmental statements impossible. In most cases the lack of baseline data, the omission of assumptions and methods of working and the failure to describe the method by which impact significance is assessed rendered the assessment unauditable. Further, the review of forest sector environmental statements highlighted that it was impossible to find one environmental statement which could be audited in its entirety. The failings described above were so widespread that very few of the individual elements assessed within the 89 environmental statements reviewed were in a state which could be audited.

From Section 6.4, it can be seen that none of the five environmental statements had presented all three of the elements required for a complete assessment. Although widely varying in adequacy, baseline data was presented in every case. The subsequent prediction and evaluation

of impact was poorly carried out or entirely omitted in all cases, resulting in assessment of impact which cannot be considered as full or acceptable, and results in difficulties when audit is attempted. It is worth remembering that the five cases included in this part of the research were seen as those containing the fullest, or best assessments. In reality, no auditable assessments of potential impact were found. While accepted as not perfect they were closest to being auditable in their present state.

This section of the research attempts to audit the potential impacts described in the environmental statements against the actual outcomes. Due to the omission of essential elements of the assessment process from the original environmental statements, in order to carry out the audit it is necessary to perform a parallel assessment based on the original baseline data. For each of the elements the information presented in the original assessment is re-stated, and the components omitted during the original assessment identified and estimated through the parallel assessment. These data are then used to audit against actual readings and values collected from fieldwork for this research.

6.5.2 Parallel Assessment of Impact on Landscape

6.5.2.1 Available Assessment Methods

The topic of landscape in relation to forestry has seen considerable coverage over a long period of time. Two of the most detailed and well known works are by Lucas (1991) and Bell (1993), both of whom have had considerable influence on the practice of landscape planning in the forest sector through their work with the Forestry Commission. Outwith the forest sector the work of Nicholas and Sclater (1993) and Nelson (1993) look at methods of evaluating landscapes in particular through a structured procedure. The Department of Transport, a regular contributor to the topic of impacts due to road building, makes specific reference to landscape assessment in its 1994 design manual. Perhaps the main bulk of work in the UK has come from the former Countryside Commission which has had a major influence on the methods used in landscape assessments within environmental impact assessments (Countryside Commission 1987, 1988, 1991, 1993).

Despite the volume of work, landscape assessment remains one of the most subjective assessments within environmental impact assessment (Turner, 1998) . The importance of visual impact assessment methods are highlighted by Sullivan, Kuo and Prabhu (1997). Goodey (1995), Fieldhouse (1993), Priestnall *et al.* (1993) and Mills (1992) highlight the fact that while experts such as landscape architects can describe the features of a landscape, illustrate the potential visual impact of a project and present a view on whether or not the landscape has been

effected, the quantification of this impact has remained an illusive goal. At the same time, however, the topic of impact on landscape is one which the layperson without formal training can give 'expert' opinion. Most people are perfectly aware of whether they like or dislike a landscape, using their experience of viewing many landscapes throughout a lifetime. However the channelling of this experience into a structured form suitable for assessment purposes requires additional guidance. It is this structured approach to the evaluation of impacts which is missing in the three environmental statements, preventing the open determination of impact significance being made in all three cases.

Within the three environmental statements, Cornharrow, Forest Farm Estate and Foudland Hill, the assessment is restricted to a brief and generally non-specialist written description of the existing landscape. This is then followed by a series of photomontages of the existing landscape together with annotated photomontages and/or artists' sketches of predicted future landscape views. While the low-tech approach is quite acceptable up to this point in the environmental statements, what follows in each of the three cases falls far short of an acceptable standard of assessment. None of the environmental statements gives an open determination of significance. The results of the review suggest lower quality assessment than that encountered by Mills (1992). Indeed, none of the cases specify whether anyone other than the environmental statement author had been involved in the determination of impact significance. In the cases of two other proposals included in the review of forest sector environmental statements, Ardchattan and Ballindalloch, the discussion on, and evaluation of the effects of the projects on the landscape, are partisan and barely disguised advocates of the proposal. In these cases the environmental statements affirm that the lay out of the proposal is already the optimum design which rather than causing adverse impact on the landscape will endow unequivocal benefit. Clearly the dependence on such prejudiced and un-verifiable treatment of impact has no place in open, competent assessment.

Within the UK and Ireland a number of researchers have proposed methodologies for assessing landscape impact. Willis and Garrod (1993) give four categories of landscape assessment intuitive assessment, database surveys of landscape features, subjective scoring of landscape features by the general public and public preference techniques such as landscape ranking. McCormack and O'Leary (1993) developed a systematic procedure for landscape analysis based on landscape sensitivity in Ireland. Therivel (2001) provides a description of the main methodologies used for evaluating landscape quality:

- Professional judgement – intuitive and analytical methods evaluating landscape elements. This method while still seen as a useful part of the process fell into disrepute as it was seen

as subjective as the non-quantitative methods;

- Landscape preferences of the public – through direct methods such as measuring preferences of different landscapes in photographs or sketches or indirect methods such as behaviour studies;
- Criteria based analysis of importance – using a series of landscape criteria to allow comparison of landscapes:
    - Rarity or value of the landscape in local, regional or nationals terms;
    - Scenic quality – pleasing patterns and features;
    - Unspoilt character – lack of industrial or urban development;
    - Sense of place – distinctive and common character;
    - Conservation interest – historic, wildlife;
    - Consensus of opinion – both public and professional;
- Strength of character and condition – how closely a landscape matches the optimum profile of its particular landscape type (for example the Chilterns) in terms of typical features. Condition describes how far removed a landscape is from its optimum visual and health states;
- Sensitivity and capacity – relates to the potential visual impact of a development on the landscape and the ability of it to absorb development without impacts.

Therivel (2001) describes landscape impacts as objective changes in the fabric and quality of the landscape, while visual impacts are the more subjective changes in available views of the landscape and the effect of these changes on people. Both Hankinson (1999) and Therivel (2001) describe visual impacts as a subset of landscape impacts that deals with impacts on views, the viewers and visual amenity. Therefore landscape impact assessment can be seen as assessing the physical effects of development on overall patterns, while visual impact assessment concentrates on the direct impacts on views and the reaction of those who may view them.

The Institute of Environmental Assessment has prepared guidelines on the assessment of landscape impacts (IEA 1994), and the Countryside Commission's (1993) manual of landscape assessment outline possible general practices. There are many descriptions of what form assessment should take, there are however two main schools of thought. The difference lies in the scope of the analysis of landscape. The Countryside Commission (1991) suggests that assessment should be a holistic study of the landscape using a multitude of methods over the physical, human, aesthetic and social association elements that can be considered to make up the landscape. Nicholls and Sclater (1993) however suggest that rather than this all encompassing methodology, a more useful technique is to limit the scope of the analysis to

specific elements of the landscape, in effect assessing the visual change in the landscape rather than the former more subjective assessment including the anthropological elements that can be thought of as making up the landscape. Stamps (1997) developed a technique to characterise the amplitude of landscape impact using an eight-point preference rating scale. Stamps suggests significance to be taken as 0.2 standard mean differences of preference ratings of before and after scenes. Goodey (1995) suggests that useful landscape impact assessment should have:

- Clear objectives;
- Comprehensive evaluation of the full range of landscape elements;
- Utilisation of an accepted methodology;
- Presentation of the results in a medium which can be accessed by the widest possible population.

The most obvious failure of the three forest sector environmental impact assessments was their lack of open evaluation of potential impacts and verifiable determination of impact significance. All three environmental statements followed the manner of Nicholls and Sclater (1993), concentrating on one element of the landscape, perceived impact, through visual impact assessment, despite being described in all three cases as landscape assessment. Landscape assessment such as described by Hankinson (1999) and Therivel (2001) was not carried out. Within this research, the reliance on baseline data included in the original assessments limits the extent of any parallel assessment that can be carried out. In all three environmental statements the assessment was limited to the presentation of rudimentary baseline data in the form of photomontages and brief accompanying description of landform. This was followed by a closed evaluation of impact and a statement, composed solely by the environmental statement author that the proposal would enhance the existing landscape. The necessity to adhere to the core objectives of the research prohibits the broad-spectrum approach to landscape impact assessment. The research reported in this Chapter concentrates on the application of environmental impact assessment in the forest sector rather than the handling of landscape assessment alone. The research will therefore focus on assessing the potential impact of the proposals on specific views of the landscape as perceived by a sample of the public, rather than an assessment of impact through description of the alteration of visual envelopes, the foreshortening of views or changes in landscape character types.

The initial step is the provision of adequate baseline data. Nelson (1993), stresses that this information should be sufficiently broad based to give an overview of the project site, however with adequate detail to allow subsequent assessment of specific items. Nelson (1993) also

highlights the necessity that, at this stage, the information provided must be restricted to the *ex-ante* situation. The introduction of details of project design or how the project layout or the landscape can be ultimately improved has no place at this point. Unfortunately this was found during the review of sector environmental statements to be a common inclusion in forest sector assessments.

6.5.2.2 Methodology Used in the Parallel Assessment of Impact on Landscape

The initial methodology proposed for the parallel assessment was to utilise the baseline photographs and photomontages and sketches of predicted future landscape presented within the original environmental statements. To allow assessment of the actual impact a third scene was introduced of the afforestation site as at 1998. Using the information within the original assessments the positions from which the original photographs were taken re-located and a repeat series of photographs were taken for each of the three sites. The methodology to be used was to incorporate the DoE (1994), technique of asking people to assess the difference between baseline and predicted, and baseline and actual views through the use of a five-point scale of scoring their perception of the changed views and therefore any impact the afforestation project may have had on the landscape. Thus interviewees were to be shown three scenes:

Scene 1- the baseline situation, using the images included within the original assessment.
Scene 2 - the predicted post-project scene taken from the original assessment.
Scene 3 - the actual existing scene photographed in 1998 for this research.

Interviewees would therefore be shown firstly Scenes 1 and 2 and asked to score their perception of any impact the project would have on the landscape. Interviewees would then be shown Scenes 1 and 3 and asked to score their perception of any impact there has been on the landscape following implementation of the project. The scoring scale used in shown in Table 20.

Table 20. Original landscape assessment scoring scale.

	Large adverse impact	**Slight adverse impact**	**No change**	**Slight beneficial impact**	**Large beneficial impact**
Difference between Scene 1 and 2 Scene 1 and 3	- 2	- 1	0	+ 1	+ 2

However a pilot study on a sample size of 20, highlighted the shortcomings of using the baseline photographs and the photomontages and sketches of the predicted views. The

photographs were described by the interviewees as out of focus, or too over-exposed or under-exposed to allow the baseline situation to be easily appreciated. Similarly the photomontages, which incorporated simple overlay of acetate film with broad bands of shading to represent the future woodland were found to obliterate the overlain photograph to such an extent that land form was lost. Other interviewees commented that the overlays having been prepared with large shaded blocks of uniform colour (solid red, green or black) that they gave no impression of what the future landscape would look like. A further comment was that it was difficult to compare the baseline photographs and the predicted future impressions. This was due to different media being used. In particular the interviewees commented that when given the choice between a poorly taken baseline photograph which was not clearly focused and underexposed to give a dark view, and a bright well drawn artists' sketch which was pleasant to look at and easy to interpret, it was very difficult focus on the impact on landscape and not to let the quality of the medium influence the assessment. The pilot study also highlighted the perceived difficulties of interviewees in using the DoE 5-point scale commenting that without discussing how much they liked or disliked the original scene, it was felt impossible to express any change in how much the second scene was liked or disliked. It was therefore decided that both the medium used for displaying the pre- and post-project views and the method by which interviewees indicated their perception of any impact would have to be changed.

Standardisation of the baseline, predicted future and actual current views was achieved through having all images re-drawn in a standard format to allow equable comparison of landscape impact rather than quality of medium. A landscape artist was employed by the researcher to sketch in monochrome the baseline photomontages and predicted view photomontages which were included in the original assessments. These sketches are included in Appendix 4.2). In the case of Foudland Hill within the original assessment the predicted views were in the form of colour artists impressions. The artist was asked to reproduce these in the same standard monochrome format. Using the photographs and subsequent field visits carried out in 1998 the artist was then asked to prepare new sketches of the actual views in the same format. With the images standardised bias due to differences in the quality of the medium should be minimised and impact due to the effect of the project alone be the subject of the assessment. In order to improve the method through which interviewees expressed their perception of the effect of the afforestation proposals on the landscape rather than score any perceived impact, interviewees were simply asked to view the three redrawn scenes for each of the three cases and score how much they liked or disliked each one. Interviewees were asked to score each scene using a five-point scale. The questionnaire used is included in Appendix 4.3.

Table 21. Revised landscape assessment scoring scale.

Scene No.	Strongly like	Like	Neither like or dislike	Dislike	Strongly dislike
	+2	+1	0	-1	-2
Scene 1					
Scene 2					
Scene 3					

From this data changes in interviewees' opinion between the original and post-project views (both predicted and actual) could be related to an interpretation of the impact through analysing interviewees' changes in scoring between the three scenes. In addition interviewees were also asked to rank the three scenes in order of preference.

6.5.2.3 Results of the Interviews

The landscape assessment information was presented in the form of a questionnaire to a sample of 200 individuals. The sample was recruited from members of the public attending a series of meetings being held as part of the Woodland Trust's Woods On Your Doorstep project in Cambridgeshire, Bedfordshire and Northamptonshire in 1998. Attendees at subsequent meetings were invited to take part in the research for this PhD until the total of 200 was attained. The responses from interviewees are presented in Tables 22 and 23. Full details of the responses are appended (Appendix 4.4.1).

Table 22. The number of respondents scoring each of the three scenes for the three cases using the five-point scoring scheme.

Case	Scene No	Score				
		Strongly like	Like	Neither like or dislike	Dislike	Strongly dislike
		+2	+1	0	-1	-2
Cornharrow	Scene 1	0	77	67	26	30
	Scene 2	64	97	29	10	0
	Scene 3	38	61	30	60	11
Foudland Hill	Scene 1	11	69	83	37	0
	Scene 2	45	34	71	50	0
	Scene 3	43	79	52	26	0
Forest Farms	Scene 1	40	104	39	17	0
	Scene 2	0	56	49	85	10
	Scene 3	18	40	54	80	8

Scene 1: pre-project view
Scene 2: 1998 view
Scene 3: post-project view

The raw data are difficult to interpret in this format however even basic analysis at a rudimentary level can identify patterns within the responses. Looking at the ranking of scenes, within Cornharrow there is a strong tendency where Scene 2 receives 66% of all first preference ranks, and Scene 3 receives 50% of all third preference ranks. One can therefore conclude that among the interviewees there was a preference for Scene 2 over Scene 3. Similarly the results for Forest Farms suggest a preference for Scene 1 over Scene 3 with the additional scene in both cases being ranked between the two. However in cases such as Forest Farms where the ranking was less divergent the formation of an overall appraisal is much more difficult to achieve. A chi-square test was used to discern whether there was a difference in the distribution of preference rankings given to each of the three scenes in each of the three cases (Appendix 4.4.1). A significant difference in the ranking of Scenes 1 and 3, Scenes 1 and 2, and Scenes 2 and 3 was found in each of the three cases. This shows that there was a significant difference in the preference ranking and that the results could not be attributed to random or systematic allocation.

Table 23. The number of respondents ranking each of the three scenes for the three cases in order of preference.

Case	Scene	Rank		
	No	1st	2nd	3rd
Cornharrow	Scene 1	19	102	79
	Scene 2	132	47	21
	Scene 3	49	51	100
Foudland Hill	Scene 1	70	72	58
	Scene 2	55	78	67
	Scene 3	75	50	75
Forest Farms	Scene 1	138	24	38
	Scene 2	27	113	60
	Scene 3	35	63	102

Scene 1: pre-project view
Scene 2: 1998 view
Scene 3: post-project view

Returning to the grading of the scenes using the five point scale, Table 24 presents the differences in grading between Scene 1 and Scene 3, the pre-project view and the predicted post-project view as presented in the original assessment. Table 25 presents the differences in grading between Scene 1 and Scene 2, the pre-project view and the actual view in 1998. In both tables the figures show the numbers of respondents who's grading changed by a certain number of levels. Thus an original grading for Scene 1 of 0 and subsequent grading for Scene 3 of +2 would result in a grade shift of +2 or a moderately beneficial impact. Similarly an original grading for Scene 1 of +2 and a subsequent grading for Scene 3 of +2 would result in a grade

shift of 0 or No change. A chi-square test was used to discern whether there was a difference in the distribution of scores between the five categories for each of the three scenes in each of the three cases (Appendix 4.4.1). A significant difference in the scoring of all nine scenes was found. This shows that there was a significant difference in the preference ranking and that the results could not be attributed to random or systematic allocation. Pearson's chi-square test was used (Appendix 4.4.1) to discern whether there was any difference in the distribution of scores between Scenes 1 and 3, Scenes 1 and 2, and Scenes 2 and 3 in each of the three cases. A significant difference in the scores given to Scenes 1 and 3, Scenes 1 and 2, and Scenes 2 and 3 was found in each of the three cases.

Table 24. Grade shift in respondents' scoring when comparing Scene 1 and Scene 3.

	Beneficial impact				**Adverse impact**		
Case	**+3**	**+2**	**+1**	**No**	**-1**	**-2**	**-3**
	Substantial	**Moderate**	**Slight**	**change**	**Slight**	**Moderate**	**Substantial**
Cornharrow	18	12	61	49	30	19	11
	(9%)	(6%)	(30%)	(25%)	(15%)	(10%)	(5%)
Foudland Hill	9	41	30	69	51	0	0
	(5%)	(20%)	(15%)	(34%)	(26%)	(0%)	(0%)
Forest Farms	10	9	23	12	57	55	34
	(5%)	(4%)	(12%)	(6%)	(29%)	(27%)	(17%)

Table 25. Grade shift in respondents' scoring when comparing Scene 1 and Scene 2.

	Beneficial impact				**Adverse impact**		
Case	**+3**	**+2**	**+1**	**No**	**-1**	**-2**	**-3**
	Substantial	**Moderate**	**Slight**	**change**	**Slight**	**Moderate**	**Substantial**
Cornharrow	11	54	91	34	0	0	10
	(6%)	(27%)	(45%)	(17%)	(0%)	(0%)	(5%)
Foudland Hill	10	42	48	30	51	19	0
	(5%)	(21%)	(24%)	(15%)	(25%)	(10%)	(0%)
Forest Farms	0	25	35	0	37	82	21
	(0%)	(12%)	(17%)	(0%)	(19%)	(41%)	(11%)

6.5.2.4 Parallel Determination of the Significance of Impact on Landscape

In order to make an assessment of the significance of the effect of the afforestation proposals on the landscape and any potential impact between Scene 1 and Scene 3 and the actual impact between Scene 1 and Scene 2 a threshold of concern must be set. As there was no information provided on the methods through which the findings were made in the original assessments it

was necessary to determine a threshold of concern for the purposes of this research. In order to do this two variables had to be determined:

- The magnitude of grade-shift which should be considered as constituting a significant impact;
- The number or percentage of respondents from the sample which would have to present this magnitude of grade-shift.

Initially the two issues were to be presented to the sample of 200 interviewees. However in the pilot sample of 20 the concepts of thresholds of concern and in particular the setting of two related thresholds were not readily understood by interviewees. The interviewees had no prior experience in the subject and the considerable time required for explanation proved to be a deterrent to potential interviewees completing the questionnaire. It was therefore considered appropriate to use a focus group of four individuals with previous experience in landscape appraisal and the assessment process, chaired by the researcher to establish the thresholds. While the use of a small group to determine thresholds of concern could be criticised as being less open than using a larger sample of the general public it is felt that this is a pragmatic approach which makes best use of the limited resources available to this research project. The focus group determined that a significant grade-shift could be considered to have occurred when the change of grade was of two or more levels. Therefore a grade-shift from Dislike to Strongly Dislike can be considered as a non-significant change, while a grade-shift from Like to Dislike would be regarded as a significant change. The focus group also determined that where 40 or more responses (20%) presented a grade-shift of two or more levels this was considered to represent the identification of a significant impact.

The results of the analysis of the grade-shifts between the pre-project baseline and the predicted post-project view from the original assessment (Scene 1 and Scene 3) using the above thresholds of concern are shown in Table 26.

Table 26. Determination of impact significance through parallel assessment (Scene 1 and Scene 3).

Scheme	Impact	Beneficial/Adverse
Cornharrow	Non-significant	Beneficial
Foudland Hill	Significant	Beneficial
Forest Farms	Significant	Adverse

Hence the results of the parallel assessment support the findings of the Cornharrow and Foudland Hill environmental statements in that there is no significant adverse impact, although as discussed earlier neither of the two environmental statements made a clear pronouncement of

the final findings. However in the case of Forest Farms the results of the parallel assessment do not concur with the original assessment findings and suggest that there is a potential significant adverse impact which should have been addressed through the process of mitigation in the original assessment. Although not specifically asked for in the survey reported here, a number of respondents provided comments on the reasons for allocating their scores and ranks. The most common comment was regarding the negative effect of ground preparation techniques when discussing Scene 2 together with the loss of wilderness or open space and the perceived closing effect of woodlands in otherwise open landscapes. Contrary comments were also given, however many fewer, noting that the addition of trees enhanced the landscape which was felt to be barren or empty. Consideration of these comments illustrates the shortcomings of restricting the assessment of landscape impacts to a limited number of people as noted within the review of environmental statements in Chapter 4.

6.5.2.5 Comparison of Predicted and Actual impacts

It was not possible to use the results of the analysis of the actual impact (comparison of Scene 1 and Scene 2) in Table 25 and apply the same thresholds of concern as the situations being viewed here are not directly comparable. The actual post-project views are all within a decade of establishment and not directly comparable with the predicted post-project views in the original assessments, which were all of mature woodland. It is interesting to note that significant beneficial impacts on landscape were determined for both Cornharrow and Foudland Hill. However a significant adverse impact was determined for Forest Farms. This suggests that the assessment also failed to identify the potential for short term impact on the landscape due to ground preparation and establishment work. The absence of a robust scoping phase is considered to be one of the reasons for this omission. It is worth noting however that none of the three environmental impact assessments provided any analysis of short-term impacts on the landscape and focused only on the impact of the mature crop, some 40 to 50 years in the future.

6.5.3 Parallel Assessment of Impact on Employment

6.5.3.1 Available Assessment Methods

While often seen as an issue of secondary importance in impact assessment, social impact assessment and its inclusion in the decision making process can be critical when the trade-off between adverse and beneficial impacts is considered during decision making. The inclusion of social issues in environmental assessment was an integral part of both NEPA and the later European legislation. However Glasson and Heaney (1993) suggest that it is infrequently considered and very rarely adequately treated within assessments. Glasson (1995) outlines a process through which direct and indirect socio-economic impacts can be addressed. The effect

on employment of Cornharrow, Beinn Leamhain and Mitchellslacks & Locherben are now investigated. While it is possible to carry out a parallel assessment for all three schemes, it has not been possible to obtain figures for the actual levels of employment on Mitchellslacks & Locherben. The audit of predicted versus actual impacts is therefore restricted to Cornharrow and Beinn Leamhain.

6.5.3.2 Additional Information Required to Complete the Parallel Assessment

All three environmental statements present baseline information on the existing employment levels through agricultural activity. The environmental statements follow on to present predicted levels of employment expected throughout a full rotation of the plantation in the case of Cornharrow and Mitchellslacks & Locherben, and over the first ten years of the rotation in the case of Beinn Leamhain. However none of the environmental statements follow on to give any indication of the means through which impact significance had been determined. The environmental statements do not make any clear determination on the significance of the impact of the project on employment although all stress the importance of their respective proposals for future employment opportunities. As discussed in Section 6.3.2, taking the change in employment within the boundaries of the proposal itself is too limited a scope for analysis, as the schemes do not exist in isolation. In particular as all of the work within small woodlands such as these is of a peripatetic, seasonal and/or of contract nature one must view the change in employment levels relative to the surrounding environment. In order to obtain a more holistic determination of impact significance one can look at the changes in employment relative to the local population. The levels of unemployment within the unitary authority areas of Dumfries & Galloway, in which Cornharrow and Mitchellslacks & Locherben schemes are located and Highland in the case of Beinn Leamhain, are presented in Table 27.

Table 27. Estimates of total workforce and number of people unemployed in Dumfries & Galloway and Highland regions during the period 1994 to 1998 (Scottish Office, 1995, 1996, 1997, 1999).

	Dumfries & Galloway			Highland		
Year	**Total workforce**	**Number unemployed [1]**	**Percentage unemployed [2]**	**Total workforce**	**Number unemployed [1]**	**Percentage unemployed [2]**
1994	69880	5800	8.3	107800	11000	10.2
1995	65517	5700	8.7	97900	9600	9.8
1996	65476	5500	8.4	97900	9300	9.5
1997	67901	5500	8.1	98900	9300	9.4
1998	67692	4400	6.5	98700	7500	7.6

[1] The number of unemployed persons claiming benefit at unemployed offices.
[2] The official 'unemployment rates' are calculated by expressing the number of claimant unemployed as a percentage of the estimated total workforce at mid year.

These figures are based on the International Labour Organisation (ILO) recommended and internationally agreed definition of unemployment. This definition was adopted for use by the UK in 1984. Under ILO guidelines all people aged 16 and over can be classified into one of three states: employed, unemployed or economically inactive. In general anyone who carries out at least one hour of paid work in a week or is temporarily away from work (for example on holiday) is employed. Unemployed people, as defined by the ILO are, out of work, have actively sought work in the past month and are able to start work in the next two weeks, or are out of work but have found a job and are waiting to start work in the next two weeks. Those who are out of work but do not meet the criteria for ILO unemployment are classified as economically inactive.

The pre-project baseline employment levels as presented within the original assessments are presented in Table 28. The levels of employment predicted within the original environmental statements are presented in Figures 41, 42 and 43.

Table 28. Baseline employment levels at Cornharrow, Mitchellslacks & Locherben and Beinn Leamhain afforestation schemes.

Scheme	Baseline employment level (years)
Cornharrow	1.0
Mitchellslacks & Locherben	5.0
Beinn Leamhain	1.0

Figure 41. Estimated with-project employment levels at Cornharrow taken from the original environmental statement.

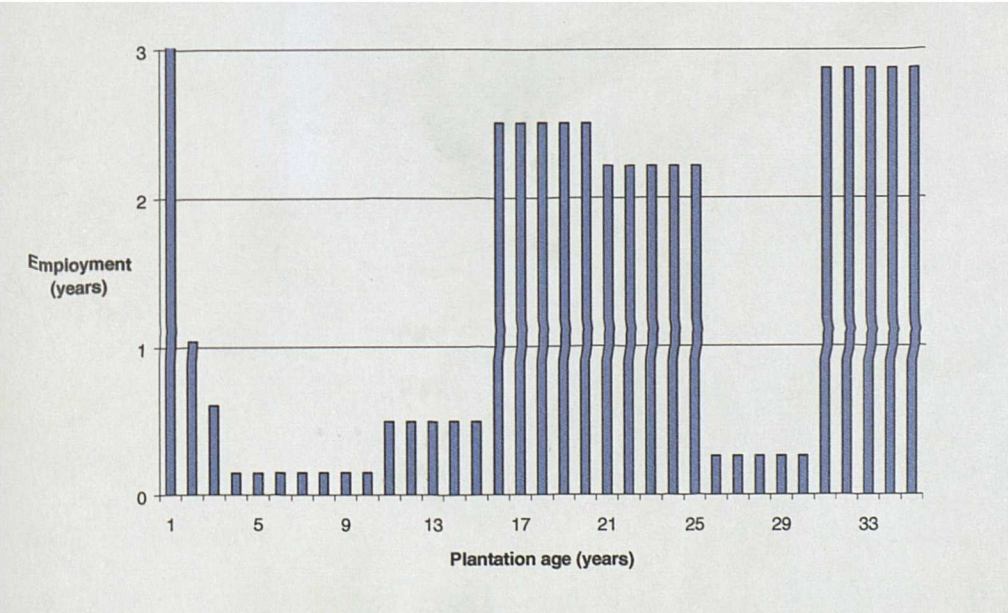


Figure 42. Estimated with-project employment levels at Beinn Leamhain taken from the original environmental statement.

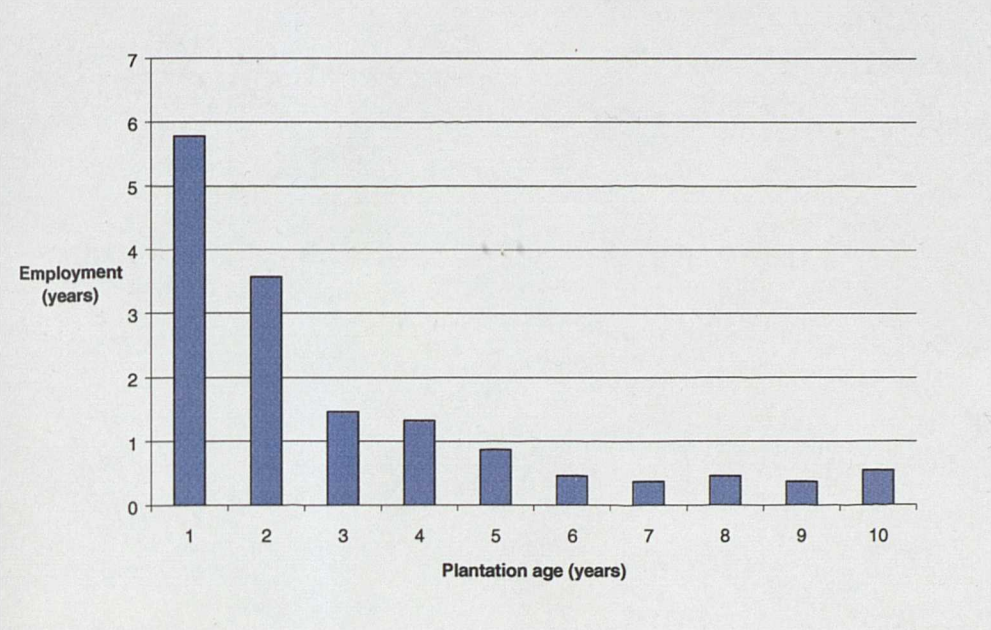
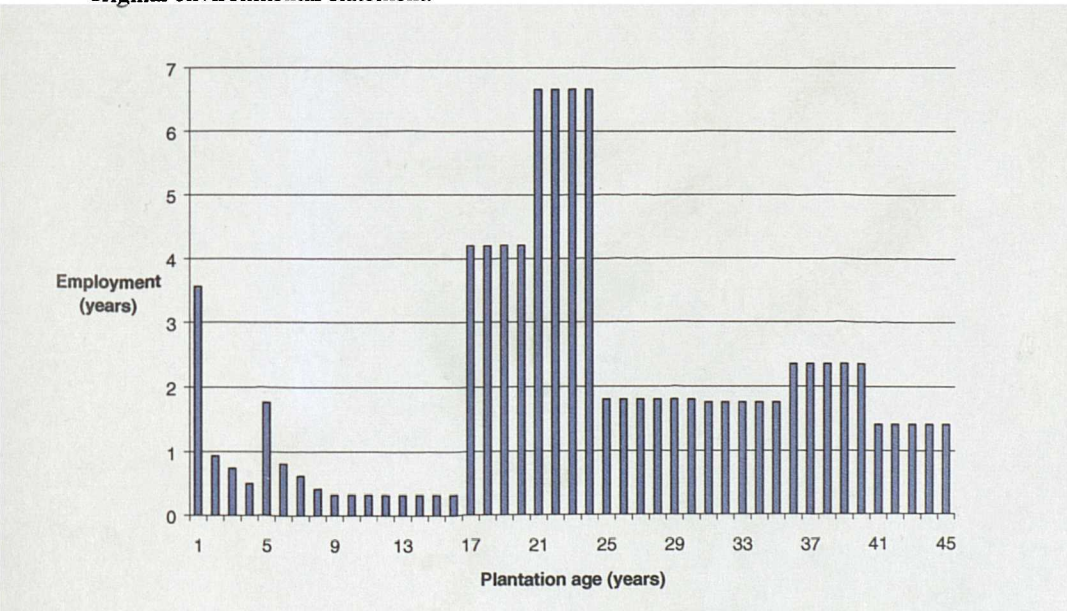


Figure 43. Estimated with-project employment levels at Mitchellslacks & Locherben taken from the original environmental statement.



6.5.3.3 Predicting the With- and Without-Project Changes in Employment

The scoping of the impact boundary to a regional (unitary authority) level is considered to be

realistic due to the fact that the afforestation work was planned and carried out by one of the major forest management companies. The work was to be carried out on a contract basis. Recent work in the UK (SGS, 1999) has indicated that forestry contractors rarely operate in a restricted geographical range. Harvesting contractors in particular, due to the high productivity rates achievable and the financial requirements of maintaining mechanised harvesting equipment, are frequently working on a regional or even multi-regional basis.

In the case of Cornharrow, comparing the figures on the number of people unemployed from Table 27 with the predicted levels of employment arising from the afforestation scheme, the average employment across the rotation length of the plantation is 2.2 years employment, compared to a single years employment through the existing agricultural operation. This represents a 1.2 year employment increase on the existing employment level. When viewed at the scale of the proposed development site this represents a 120% increase in employment. However taking a wider viewpoint from Table 27 using the year of initiation to be the year in which the environmental statement was produced, a 1.2 year increase equates to 0.0002% of the number of people unemployed regionally.

The Mitchellslacks & Locherben environmental statement gave a baseline level of employment of two on Mitchellslacks and three on Locherben involved in agriculture. Due to the afforestation proposals one job is to be lost at Mitchellslacks while no change is expected within the agricultural operation on Locherben. Over a full rotation of the afforestation scheme the environmental statement predicts an average rate of employment of 2.52 years in addition to the four posts remaining within the agricultural operations. Taking a regional perspective as discussed above this equates to 0.00026% of the number of people unemployed within the region.

The Beinn Leamhain environmental statement follows a slightly different method of impact prediction by utilising figures estimating the total number of jobs per hectare of woodland including downstream employment from processing. This is estimated to be one full time equivalent post for every 110 ha of woodland. Thus with a total area of 675 ha, 6 full time equivalent posts could be expected, but it must be remembered that the context of this figure is sector-wide and thus would have to be discussed in relation to national levels of unemployment. It should also be remembered that the sector-wide figures relate to all productive woodland in the country, in which operations relating to all stages of the rotation are being carried out. This is radically different from the situation which would be in existence at Beinn Leamhain, where the site would have to pass through stages of establishment, thinning and clearfell. Even with

the adoption of an extreme programme of normalisation there would remain considerable fluctuation in employment requirements. In addition because the figures presented in the environmental statement are on a sector wide perspective, they will heavily reflect employment requirements arising from commercial conifer plantation forestry, which constitutes over 60% of forests in Great Britain (FIC, 1998). This type of forest is fundamentally different from that proposed within the Beinn Leamhain project and therefore employment characteristics will be different. Differences include natural regeneration with slower establishment, lower yields and longer rotations rather than direct planting, and the associated high yielding commercial species with shorter rotations.

The validity of applying figures drawn from sector wide analysis in the prediction of employment levels to a project dissimilar to the majority of those from which the estimates are drawn on a limited area of 675 ha is questionable. In relation to the sector totals of 10255 jobs and 1.131 million ha referred to in the environmental statement it is likely that a 0.0006% increase in forest area could be, in part, dealt with using existing employment levels rather than as suggested, one additional post is established with every additional 110 ha. The environmental statement does not make an estimation of employment levels over the full rotation, but limits this to a theoretical estimation over 25 years and a calculated level over the initial ten years of the project life. Over the initial ten years the environmental statement predicts a reduction of 0.2 years employment within the agricultural operation due to the scheme which would be off-set by an annual requirement of 1.52 years over the first 10 year period of the afforestation project. This leaves a 1.32 year increase in employment due to the scheme (over the initial ten-year period). This equates to 0.0001% of the regionally unemployed total.

6.5.3.4 Parallel Determination of the Significance of Impact on Employment

Given the low levels of change indicated in all three of the schemes it is not considered necessary to discuss the wider economic effects of the schemes through the introduction of multipliers as discussed by McNicholl (1981), Lewis (1988) and Glasson (1992). However in order to complete the assessment the determination of impact significance must still be carried out through the setting of a threshold of concern and its comparison with the predicted impact of the proposal. There are, however, no recognised standards or levels which may be used as thresholds of concern. Glasson (1995) suggests that one may be able to identify changes in employment levels which would create boom or bust conditions, or initiate high levels of leakage which may be considered as thresholds of concern. However it must be recognised that the setting of thresholds of concern for many socio-economic impacts will be somewhat

arbitrary. In these cases the process of triangulation, ,using varied sources of information, theories and methods simultaneously can be a useful approach. The approach used within this research was to conduct a survey which asked how many newly created jobs would constitute a significant change in the number of unemployed given regional unemployment figures. The same sample of 200 people as discussed in section 6.5.2.3 were presented with figures on the levels of population and numbers of people unemployed within the unitary authority areas within which each of the three afforestation projects were located. The questionnaire used is included in Appendix 4.5. The interviewees were asked to state what they considered to be a significant increase in employment given the total population and level of unemployment. The results of this questionnaire are presented in Table 29.

Table 29. Threshold of concern derived from sample questionnaire, predicted increase in employment levels from original environmental statements and determination of significance through parallel assessment.

Location	Scheme	Threshold of Concern (years)	Confidence Limits (95%)[1]	Predicted increase in employment (years) from ES	Determination of significance
Dumfries & Galloway	Cornharrow	182	+/- 14	1.2	Non-significant
Dumfries & Galloway	Mitchellslacks & Locherben	182	+/- 14	1.52	Non-significant
Highland	Beinn Leamhain	229	+/- 26	5	Non-significant

[1] See Appendix 4.6

The results show that none of the schemes can be considered to have a significant effect on levels of employment within the area of the unitary authorities in which the three afforestation proposals are located. As discussed earlier due to poor presentation of information within the original assessments none of the environmental statements included an unambiguous determination of impact significance. However in all cases the implication was that the schemes would result in increases in employment levels which could be considered to be significant. Despite provision of good baseline data none of the assessments attempted an open appraisal of effects or explained the methods through which impact significance would be determined.

6.5.3.5 Comparison of Predicted and Actual Impacts

As discussed earlier while it was possible to obtain data on actual employment levels from the projects managed by one of the country's largest forest management companies in the case of Cornharrow and Beinn Leamhain, the managers of Mitchellslacks & Locherben were not able

to provide this information. All works had been carried out on contract on a fixed fee basis on Mitchellslacks & Locherben and therefore the managers did not collate details of actual employment levels. In the absence of this information for Mitchellslacks & Locherben the comparison of actual and predicted levels of employment is limited to Cornharrow and Beinn Leamhain alone. The analysis of actual and estimated levels of employment is presented in Tables 30 and 31 for Cornharrow and Beinn Leamhain respectively.

Table 30. Comparison of estimated and post-project implementation employment figures for Cornharrow scheme.

Year	Estimated Employment Figures		Actual Employment Figures	
	Days	**Years**	**Days**	**Years**
1	1097	4.77	1028	4.47
2	239	1.04	249	1.08
3	140	0.61	54	0.23
4	35	0.15	46	0.20
		6.57		5.98

Table 31. Comparison of estimated and post-project implementation employment figures for Beinn Leamhain scheme.

Year	Estimated Employment Figures		Actual Employment Figures	
	Days	**Years**	**Days**	**Years**
1	1330	5.78	1005	4.37
2	822	3.57	58	0.25
3	335	1.46	239	1.04
4	305	1.33	151	0.66
5	200	0.87	12	0.05
		13.01		6.37

In the case of Cornharrow over the first four years the actual figures correspond closely with those predicted within the original environmental statement. The actual total number of years employment for the first four years is within 0.59 years or 9% of the estimate given in the original assessment. Carrying out a similar comparison between estimated and actual levels of employment for Beinn Leamhain, there is a marked difference between predicted and actual employment levels. Actual levels of employment are 6.64 years less than or 49% of the level predicted within the original assessment. Referring to the thresholds of concern stated earlier in Table 29 it can be seen that the actual effect of the projects on employment levels have not broken the threshold of concern and therefore can be considered as non-significant in the cases of Cornharrow and Beinn Leamhain.

6.6 Chapter Summary

In common with the results of the review of forest sector environmental statements in Chapter 4, the detailed examination of the five environmental statements highlights the fundamental lack of the essential three part assessment process; provision of baseline information, prediction of impacts and determination of impact significance. However it should be noted that the five environmental statements and the two elements examined were the best examples within the 89 environmental statements reviewed. Throughout the 89 environmental statements reviewed the almost universal failure to adequately complete the three-part assessment process should not be overlooked. In addition the lack of readily auditable assessments of individual elements (rather than whole assessments), while similar to that found in other studies such as Bird (1996) should give cause for concern.

None of the five assessments carried out an open and verifiable assessment of impact. While baseline data was available this was not fully utilised in any of the cases. The parallel assessment was necessary as there were no details of the mechanisms through which impacts had been predicted and significance determined. The methodologies used within the parallel assessment, while employed in other sectors, are not to be found in any of the 89 environmental statements reviewed in this research. The fact that this is the first verifiable assessment of landscape impact in 89 environmental impact assessments is a reflection of the quality of assessment in the forest sector. None of the techniques used are innovative or complex but do not appear to have been previously used in forest sector environmental impacts assessments. The results from the parallel assessment suggest that while some environmental impact assessments have been able to reach an appropriate determination of impact significance, the means by which this has been achieved is not verifiable. These same uncertain methods are however also capable of providing false negative results in the case of adverse impacts and false positive results in the case of beneficial impacts. This level of uncertainty cannot be considered to be a satisfactory basis on which to base decisions and should be identified and dealt with through a review process. The results also provide supporting evidence for the findings in Chapter 4. The quality of assessment within forest sector environmental impact assessments has been found to be low. In the environmental statements examined here, at least, this is not due to the lack of baseline data, methods of predicting impacts or means of determining impact significance. The shortcomings of the environmental impact assessments result from the failure of the practitioners within the sector to apply readily available tools, and the Forestry Commission to adequately review environmental statements before their introduction to the decision making process.

CHAPTER 7 CONCLUSIONS AND IMPLICATIONS

7.1 Introduction

As an introduction to the final chapter of this research it is useful to revisit the situation within which this research was commenced in 1996. At that time the number of environmental impact assessments being called annually within the forest sector had doubled from 15 in 1989 to 30 in 1996. Through this period there was continuing general disquiet among forest owners and forest managers concerning the application of environmental impact assessment to projects that appeared not to warrant such investigation. There was also comment from within some Forestry Commission conservancies in Scotland over the amount of resources being tied up administering a large number of environmental impact assessments, the output from which provided little new information for decision making. However, there had been no large-scale investigation of the application and effectiveness of environmental impact assessment within the forest sector. Further, the continuing challenges from both the pro- and anti-forestry lobbies that environmental impact assessment did little to improve afforestation projects had been left largely unanswered.

The work carried out by Gray (1996) was the first application of independent review procedures for environmental impact assessment within the forest sector in Great Britain and also the first time the assessment process within the forest sector as a whole had been subjected to formalised research. The work suggested that the overall standard of assessment within the forest sector was poor and stressed the major limitations on the efficacy of the process through inappropriate scoping, inadequate baseline data and evaluation of impacts and the lack of adequate monitoring programmes included within the resulting projects. The work discussed the problems associated with the lack of an effective environmental statement review process and the low levels of public participation within the process as a whole. The 1996 work also suggested that the standard of environmental impact assessment within the forest sector appeared to be improving as all actors involved within the process gained experience. Since 1996 the environmental impact assessment regulations within the forestry sector have been twice revised and practice has been developed through initiation of third party environmental statement reviews and formalisation of the scoping process within some of the Scottish conservancies.

This chapter summarises the main findings of the research and details the conclusions which can be drawn from it. The chapter ends with a discussion of the implications for environmental impact assessment practice within the forest sector together with the identification of the limitations of this research and the opportunities for further research work.

7.2 The Level of Afforestation and Environmental Impact Assessment Activity

The practice of environmental impact assessment within the forest sector in Great Britain is moving into its second decade. Although it is now a well-established procedure with 101 environmental statements completed between 1988 and 1998, it continues to receive a mixed reception. The pro-forestry lobby continues to claim that environmental impact assessment is an additional level of planning control which is unnecessary due to the environmental protection already afforded through existing measures. Environmentalists and other stakeholders claim that the environmental impact assessment process is failing to adequately identify and where appropriate mitigate possible adverse effects of afforestation projects. Similar polarised views have been noted in other sectors subject to environmental impact assessment legislation. However, little has been done to refine the assessment process, utilising the experience gained by the Forestry Commission and others to ensure that environmental impact assessment continues to develop into an expedient mechanism providing adequate protection against adverse effects and assisting the creation of balanced projects.

Over the period 1988 to 1998 a total of 159,736 ha of new private afforestation in 22,077 schemes were completed in Great Britain. A further 20,400 ha of afforestation has been carried out by Forest Enterprise. Of the 211 proposals deemed to require assessment during this period, 101 have passed through the environmental impact assessment process, resulting in 26,658 ha of new planting under the auspices of the Woodland Grant Scheme. This constitutes 16% by area and 0.5% by number of all Woodland Grant Scheme afforestation projects completed within the period 1988 to 1998. However the focus of this activity has been firmly within the private sector and within Scotland. While accounting for over 11% of the total area afforested, only 2 Forest Enterprise projects totalling 288 ha have been subject to assessment. However it should be noted that the contribution to annual afforestation rates by the Forest Enterprise has declined markedly over the past decade. Although Forest Enterprise afforestation accounted for up to one third of all afforestation projects within the first five year period, by 1998 Forest Enterprise afforestation accounted for only 0.6% to the total area planted in England, Wales and Scotland. Of the 101 completed assessments only three were located outside Scotland and of the 211 environmental impact assessments called 205 were within Scottish conservancies.

7.3 The Legislative Framework

As a member of the European Union the legislative foundation for environmental impact assessment of afforestation projects in the United Kingdom was Directive 85/337/EEC and its subsequent revision through Directive 97/11/EC. Afforestation projects are classified within the Agriculture sub-category of Annex II of the Directive. After an inauspicious start the acceptance of and confidence in environmental impact assessment across all sectors has

improved as public and private organisations have built up an understanding of, and trust in, the process. Within the European Commission there has been a rapid acceptance of environmental impact assessment as an important part of the planning cycle. The current United Kingdom legislation for the forest sector came into force on 6 September 1999 and built on the changes brought about by the 1998 legislation. However, while both changes in legislation were enacted after the period from which the review of forest sector environmental statements were drawn and therefore changes in practice resulting from them will not be evident, their potential effect is worthy of discussion.

One of the main features of the 1999 legislation is the quantity of information on administrative procedures and timetables and the relative absence of direction on the practice of environmental impact assessment. The legislation provides lengthy description of the steps that may be taken by the competent authority and proponent, in the determination of the relevancy of projects, the request for assessment and the various routes to appeal, together with provision for the coverage of transboundary effects. However while the framework for the process in terms of responsibilities and timescales is detailed, there is very little direction as to how the process should be applied in practice. This omission could be acceptable were adequate guidelines and manuals available on the application of environmental impact assessment. However, as will be discussed in section 7.2.2, over a decade since the introduction of the first legislation the forest sector is still awaiting the publication of detailed guidelines on the application of environmental impact assessment within the forest sector.

There has been a considerable volume of environmental impact assessment activity within the forestry sector since the introduction of environmental impact assessment legislation in 1988 (Wood, 2000). Compared with other sectors within the UK and other countries the number of afforestation projects determined by the Forestry Commission to require environmental assessment is high. In Section 2.5 reference was made to competent authority screening processes and how new lower thresholds may precipitate a greater number of assessments. However it would appear that an additional factor might be influencing the number of assessments carried out. In Canada the initiation of an environmental impact assessment is restricted quite firmly to those projects with the greatest potential environmental impact. An average of only three full environmental impact assessments are carried out annually. A much larger number of projects with potentially smaller environmental impact are subjected to a less intensive form of assessment. Comparing the full environmental impact assessments from other sectors and countries (CEC 1993; Lee *et al.*, 1994; Jones and Wood, 1995; Wood, 1995; Sadler, 1996) with those submitted within the forest sector shows those environmental statements produced to assist the Forestry Commission decision making process are of distinctly inferior

quality and subject to a far less intensive assessment process and have more in common with the lower level investigation such as the initial environmental examination. While comparison of individual pieces of legislation from different countries can be misleading without concurrent consideration of supporting legislation and the frameworks within which they operate, one can identify elements which may afford additional capability or thoroughness within the environmental impact assessment process. One of the major limitations of the British system is that the initiation of the formal assessment process has been an unnecessarily rigid procedure. A reason for this is that while the Woodland Grant Scheme process does provide the facility for the Forestry Commission to request further information on a proposal there is no formal system to initiate or regulate this. Although the involvement of the Regional Advisory Committee formalises the utilisation of information, the capture and presentation of additional details is not systemised. The burden of obtaining further information has therefore fallen to the environmental impact assessment process. While in some cases this may be necessary, in many cases a much less rigorous procedure may be sufficient. Such cases are dealt with in other legislative frameworks through the use of a two-tier environmental impact assessment system, the less rigorous of which provides the formal structure for data collection and information presentation but does not subject the project to the expense or time delay of a full environmental impact assessment. Through this process countries such as Canada, the USA and Australia maintain the provision of information for the decision making process but restrict the application of full environmental impact assessment to only the most potentially damaging projects.

The 1999 legislation provides no provision for the review of environmental statements despite the general acceptance of the benefits of the review process when used by proponents, competent authorities and consultees to improve the resulting assessments. Review is formalised within the Dutch and Canadian processes and is further strengthened through the establishment of independent review bodies. In addition, despite findings(Shopley and Fuggle, 1984, World Bank, 1991, Lee and Dancey, 1993, EC, 1995b, CEAA, 1997) suggesting that the scoping phase is one of the most important elements within the whole environmental impact assessment process, the 1999 legislation does not include the requirement for a mandatory scoping phase. Procedures in a number of other European countries such as Belgium and the Netherlands and internationally in the USA, Canada and Australia include discrete scoping exercises.

The new legislation fulfils the requirements of Directive 97/11/EC to include thresholds for identification of projects likely to have significant effects on the environment in order to improve the targeting of environmental impact assessment through improved screening. The

new legislation amends the crude 1988 threshold of 100 ha, above which projects would receive particular consideration of the need for assessment. The new legislation reduces this threshold and suggests that without exceptional circumstances afforestation projects smaller than 2 ha in sensitive areas and smaller than 5 ha in non-sensitive areas are to be treated as not likely to have substantial effects on the environment. Taking the higher of the thresholds on non-sensitive areas, within Scotland the average area of an afforestation project between 1988 and 1998 was 16.40 ha. Additionally, within Scotland between 1988 and 1998 projects smaller than 5 ha constituted 69% of all proposals but only 7% of the total area afforested. Looking at the numbers of environmental impact assessments called during this period it is evident that the approach taken by the Forestry Commission from the 1988 legislation to treat each project on its merits with the use of a 100 ha minimum threshold did not result in many small afforestation projects being called for assessment. Out of the 211 afforestation projects called for assessment only 11 were less than 50 ha in extent and only one project was less than 5 ha which was subsequently withdrawn by the applicant. Within the 101 projects which have passed through the assessment process and been approved, only 2 projects were smaller than 50 ha and none were smaller than 5 ha in extent. The value of applying such small thresholds is therefore questionable and their impact on the application of environmental impact assessment process in terms of focusing attention on key projects is negligible. The probable outcome will be an increase in the number of assessments called. The argument put forward by those opposing the application of environmental impact assessment within the forest sector was not that too many small scale projects were being caught in the process, rather, the previous indicative threshold of 100 ha was a reasonable starting point for cases where the site was not sensitive but that the screening of projects larger than 100 ha was not being carried out rigorously enough. The legislation as it stands, in the absence of further guidelines does not appear to fully address this point. Therefore it can be seen that while the UK Government has implemented new legislation to comply with Directive 97/11/EC there has been little practical implementation in those areas identified in 1993 (CEC, 1993) as requiring improvement.

The main conclusions on how the legislative framework has shaped the use of environmental impact assessment in the British forest sector are:

- The legislation in its current format includes limited detail on the requirements for the practice of environmental impact assessment and is considered to be inadequate without supporting guidance on best practice;
- The legislation retains the single tier system which restricts the application of the assessment process to full environmental impact assessments, and does not allow the techniques of assessment to be utilised at an appropriate level for projects for which full environmental impact assessment is unnecessary, but would benefit from a formalised

procedure for presentation of further information;

- The current legislation fails to require basic elements of the assessment process which are considered as essential to the sound performance of environmental impact assessment and therefore leaves inherent weaknesses within the legislative framework in the following areas:
    - Scoping;
    - Consultation;
    - Review;
    - Monitoring.

7.4 Application of the Environmental Impact Assessment Process

7.4.1 Involvement of the Forestry Commission

The multiple roles of the Forestry Commission were discussed in Section 3.2. The Forestry Commission acts as the promoter of forestry activity through financial assistance and provision of advice, and as the regulator through administration of the Woodland Grant Scheme. Within the environmental impact assessment process the Forestry Commission also has multiple roles. As competent authority the Forestry Commission administers the environmental impact assessment process, calls for the assessment, decides on the acceptability of the environmental statement for the decision making process and finally deliberates on the proposal's admission into the Woodland Grant Scheme. However, in a number of the cases which were included in this study, the Forestry Commission played an additional role which could be thought of as compromising the Forestry Commission's impartiality in both the judgement to accept the environmental statement into the decision making process and the ruling as to whether the proposal should be approved or rejected.

The files accompanying a number of the environmental statements indicated that local Forestry Commission officers were heavily involved in the production of the environmental statement. In one case, a sequence of sections were forwarded as drafts to the local Forestry Commission office for correction and redrafting before their inclusion in the final environmental statement. Two points arise from this. Primarily, although the Forestry Commission as competent authority is obliged to assist in the production of the environmental statement and advise on technical forestry matters, there must be some limit to the involvement of Forestry Commission personnel, if only to ensure evenness of assistance across the country. It would be unfair on applicants outwith these conservancies if they were to produce environmental statements without a similar input from the local Forestry Commission personnel. In addition, this involvement goes against the current Government policy of delegating financial responsibility to the proponent. The number of environmental statements requested each year suggests this

additional involvement could constitute a considerable burden on the Forestry Commission. Secondly, if Forestry Commission staff have been instrumental in the drafting and redrafting of the environmental statement the impartially of the decision to accept the environmental statement into the decision making process may be questioned. It is doubtful if one who is heavily involved in the production of a body of work would then reject it when called to deliberate on its quality and thoroughness. Further guidelines appear to be necessary to strengthen this area.

Afforestation projects are included within Annex II of Directive 85/337/EEC, and therefore the application of the environmental impact assessment process is discretionary. Following on from the EC's review of performance (CEC, 1993), the Commission's guidance on screening (EC, 1995a) contains a framework around which a useful sequence for ensuring screening is carried out appropriately, this includes the use of screening checklists and the recording of the screening process and the final decision. The guidance follows on to suggest that dialogue between the proponent and the competent authority on potential issues, consultation with other environmental agencies and the public to determine the level of concern about the project and specialist advice from appropriate experts can all assist in the screening process. From the case files examined during the review of forest sector environmental statements it was noted that while the Forestry Commission may consult statutory consultees on screening decisions, this was not done universally. Many screening decisions were made without reference to any outside parties.

7.4.2 Identifying Potentially Damaging Projects

Although data were not available to give a complete breakdown of afforestation applications for the period 1988 to 1998 across the whole of the United Kingdom, those figures obtained for Scottish conservancies can give some insight to the distribution by location and scheme size. Generally conservancies with a greater area approved for planting also have a higher number of schemes subjected to assessment. Without complete statistics it is difficult to draw any conclusion as to whether or not there is variation between the conservancies in their application of the existing guidelines for requesting assessment. The compilation of these data from conservancy archives should be made a priority for future monitoring purposes. On an international level, Wood (1995) noted that the Netherlands EA Commission reviewed 68 environmental impact assessments in 1993; Glasson *et al.* (1994) estimated that only 3 full environmental statements are prepared annually in Canada, and 30 in Australia; while approximately 600 environmental statements are prepared annually in the US. Although the above countries have tiered environmental impact assessment systems, the number of environmental statements requested by the Forestry Commission can be seen as high. By

comparison, of the 101 environmental impact assessments that have completed the process within the forest sector only one has been rejected following the assessment due to its potential adverse impact. It may therefore be the case that rather than calling for too few assessments the Forestry Commission may be calling for too many assessments. This view is supported through investigation of Woodland Grant Scheme files during the review of forest sector environmental statements. Within a number of cases statutory consultees responded to the Forestry Commission that there were no issues of concern or only minor issues which could be easily resolved through small amendments to the proposals. These projects were however subjected to environmental impact assessment of the issues the consultees had previously cleared. Justification for requiring assessment due to public concerns or other reasons was not mentioned within the files. On this basis the Forestry Commission screening process could be questioned. Of the sample of 89 environmental statements reviewed for this research, few of the assessments concluded that their particular proposed afforestation project would have a significant adverse impact on any constituent part of the environment. Any impacts remaining following explicit mitigation measures or implied mitigation through a broadbrush commitment to follow the various forestry guidelines, were classified as minimal or non-significant. None of the reviewed environmental statements therefore suggested that significant adverse environmental impact would result from project implementation. With only one project rejected and the majority of environmental statements not finding any significant impacts it would appear that the Forestry Commission's screening process is unable to always differentiate between projects with potentially significant and non-significant impacts.

7.4.3 The Efficacy of the Forestry Commission Screening Process

The investigation of the five possible screening situations detailed in Chapter 5 through the audit of afforestation projects had to be amended due to the lack of auditable data within the environmental statements reviewed for this research. The alternative method using audits of individual elements of assessments and the screening case studies was also hampered by the limited data within the environmental statements and the low completion rate of the case studies by Forestry Commission staff. However a number of conclusions can still be drawn from the work. Firstly as will be discussed in Section 7.4.4 the overall quality of environmental impact assessment was found to be below an acceptable level. Also from the limited audit of assessments the reliability of the determination of impact significance cannot be assumed to be correct in all cases. Bearing in mind the low number of assessments which identified significant impacts it is therefore considered appropriate to discount the scenarios which suggested that assessments were correctly determining potential impacts as non-significant.

This leaves two possible situations that the Forestry Commission either correctly or incorrectly

screens projects. Firstly considering that the Forestry Commission is incorrectly screening projects by requesting too many assessments and is failing to adequately focus attention on the most potentially damaging projects; or requesting too few assessments and allowing potentially damaging projects to pass through without assessment. In either case the Forestry Commission screening process requires some tightening to ensure there is no undue burden placed on proponents, without the risk of allowing potentially damaging projects to proceed unmitigated. Alternatively, one can assume the Forestry Commission screening process is correctly identifying potentially damaging projects and is adequately 'flagging' potential adverse impacts. Taking into consideration the results of the review of forest sector environmental statements the Forestry Commission's review process requires re-appraisal, and further guidance offered to proponents and Forestry Commission officials on the required content and precision of assessment.

The dénouement of this is extremely difficult due to the wide variation in the quality of the environmental statements sampled and the lack of any record of the process through which Forestry Commission staff reached their screening determination. However, it is important to consider the high number of assessments called in comparison with other sectors, in conjunction with the results of the screening case studies and the review of environmental statements. It could be justified that the Forestry Commission screening process is overzealous and is calling for a larger number of assessments than is necessary. However this could be tempered with the knowledge that more than 50% of all Woodland Grant Scheme projects between 1988 and 1998 greater than 500 ha were not subjected to the environmental impact assessment process. In summation it is therefore only possible to conclude that the Forestry Commission screening process requires strengthening and that the information collated during this research suggests that the assessment process is being initiated in cases which full environmental impact assessment is not required. The 20% drop out rate of projects screened for assessment and the fact that one third of practitioners had cancelled projects due to the possibility of requiring an assessment suggests that the assessment process has effects on the forest sector other than those felt directly by those carrying out assessments.

The investigation into screening within this research highlighted the weaknesses in the current system. While the number of respondents from the Forestry Commission was limited, they along with the responses from proponents and consultees did highlight that there were differences between the conservancies in the manner in which screening was carried out. Responses from consultees suggested a range of depth of liaison between themselves and the Forestry Commission conservancy offices. While 22% of consultees considered themselves to be always consulted on the screening of projects none of the Forestry Commission staff

suggested that consultees would always be consulted, and 34% of Forestry Commission staff suggested contact with consultees on screening would be rare. As stated in Chapter 5 it would be impractical and costly for consultees to be consulted on every afforestation proposal, however there appears to be differences in the interpretation of the present system between the Forestry Commission and consultees and some degree of misunderstanding as to when consultees should become part of the screening process.

One of the main areas of weakness within the Forestry Commission's screening process is that it is not carried out in a systematic, recorded manner. Weston (2000) suggests that the likelihood of legal challenge has increased following the implementation of the 1999 legislation. Weston (2000) follows on to suggest that competent authorities must adopt a more robust and systematic approach if they are not to be exposed to undue risk. In general Woodland Grant Scheme applications are handled on a hierarchical system through which junior officers are assigned projects on a geographical basis, referring to senior staff as and when necessary for guidance. Responses to the questionnaire from Forestry Commission staff in Chapter 5 illustrated that two thirds of respondents used no tools to aid the screening process such as matrices of checklists. The files which accompanied the environmental statements included in the review displayed limited use of systems for recording the cases' path through the series of deadlines for processes such as responses to initial application, the screening decision and notification of consultees. However while most of the case files contained evidence of procedural compliance in the form of copies of letters, very few contained any form of record of the reasons why a project should or should not be considered as having potentially significant adverse effects. In most cases the only reference was the standard template letter sent to the proponent informing that an assessment was required. Interestingly one respondent from the Forestry Commission staff suggested that screening was now a formal procedure. However other than individual conservancy initiated documents which noted basic details such as project area and site sensitivities there are no formal screening procedures in use across the Forestry Commission. It is important for the Forestry Commission to have some system to ensure that all applications are handled in the same manner regardless of which conservancy the project site happens to be in. It is also important for monitoring and reviewing reasons to have this system documented to enable verification of the process through auditing. Without this stage the development of environmental impact assessment within the sector has been stifled and improvements have not been forthcoming. Additionally the systemisation of the screening process would also serve as a mechanism through which the opening of the screening process to consultees could be formalised and recorded. The initiation of a more refined screening process which examines initial afforestation proposals in greater detail would focus attention more definitely on only those proposals with potential significant impacts and move away from a

system which relies on broad brush categories such as the size of project.

A principal method of improving the quality of assessments and environmental statements, and one in which the Forestry Commission has already made some progress, is the production of additional guidelines on the form and detail of investigation required in assessment and the content and depth of information required in the environmental statement. The documents currently being drafted by the Forestry Commission include a mock-up environmental statement of the form sought by the Forestry Commission and emphasises the role of the environmental statement as an aid to the decision making process. However this guidance has yet to be published and has seen several drafts over the past four years. Since the only sector specific guidance is contained within the 1993 booklet (Forestry Authority, 1993) the publication of new guidance should be seen as a priority.

The screening case studies provided to Forestry Commission staff and university students provided an insight into their ability to screen afforestation projects based only on the information available to Forestry Commission conservancy staff when the actual screening decision was made. The original intention was to compare the screening decisions of the various conservancies, however due to the limited number of returns from the Forestry Commission an additional group was enlisted. Therefore in addition to allowing the accuracy of the Forestry Commission staff's screening decisions to be observed (on a smaller sample than had been expected), the case studies provided the opportunity to compare the Forestry Commission staff's performance against another group. The selection of the sample of students allowed a comparison of screening between a group with a range of experience in forestry and environmental impact assessment but with no training in assessment and a group with limited practical experience in forestry and assessment but who had recently completed an introductory course on environmental impact assessment. The results showed that neither group were successful in correctly screening the four case studies. The majority of students incorrectly screened a false-positive case therefore potentially subjecting a project to assessment where this was not actually required. The Forestry Commission staff majority decision incorrectly screened a false-positive, and a true-negative case therefore requiring an assessment where one was not actually required, but also allowing a project with potentially significant adverse impacts to proceed without assessment.

7.4.4 The Forestry Commission and Environmental Statement Review

The decision making process on Woodland Grant Scheme applications is devolved to conservancy level, with arbitration provided by the Regional Advisory Committees, and the lines between the Forestry Commission and proponent are clearly drawn. The review of environmental statements is also handled at conservancy level. Two comments can be made:

firstly the devolution of the review process. At present the review of environmental statements submitted to the Forestry Commission appears to be done on an individual basis with the local officer deciding whether or not the environmental statement is acceptable although a number of environmental statements have been subjected to review since 1996. At present there appears to be no guidelines as to how this review should be carried out. Without such procedures it may be difficult to ensure even treatment across the country and ensure the standard of assessment is maintained countrywide. The review schedule prepared for this work could form the basis of a Forestry Commission review procedure, using the local knowledge of the conservancy staff to tailor the review to the particular situation, and assessing the items on the checklist as of a standard acceptable for inclusion in the decision making process or requiring additional information to reach that standard, using an approach similar to that proposed by Colley and Raymond (1994). Secondly, with the level of input from some Forestry Commission personnel in the preparation of the environmental statement it would appear prudent to install a system which removes the review of the environmental statement away from the personnel who may initially help to prepare the environmental statement and ultimately adjudicate on the WGS application. One option would be to merely initiate an exchange system where the environmental statement is reviewed by another conservancy. However this would have to involve local personnel to avoid the loss of the local expertise. Another option could be to set up an environmental impact assessment review committee which could sit on a regional or national basis. A variation on this could be to open membership of the committee to invited individuals or organisations outwith the Forestry Commission to sit on a conservancy (or national) environmental impact assessment review committee.

In common with other works (Jones and Wood, 1995, Wood, 2000) the results of the environmental impact assessment questionnaires indicate that the main actors, (the Forestry Commission, statutory consultees and environmental statement authors) felt that the assessment at best did little to assist the decision making process or at worst was a volume of work that could not be trusted. Additionally actors commented that the assessment provided no additional information that a competent forest manager should not already have and rarely provided any additional information that was not brought out and acted on during the newly adopted scoping phase. The reluctance of Forestry Commission personnel to accept the findings of environmental statements should be of concern to the Forestry Commission and the forest sector as a whole. If Forestry Commission staff believe environmental statements to be untrustworthy the system which also allows the same Forestry Commission staff to accept the quality of the environmental statements in the first place must be reviewed.

Although the Woodland Grant Scheme Grants & Licence Division Code stipulates that a copy

of each environmental statement accepted by the Forestry Commission be sent to Private Woodlands Branch at HQ for monitoring purposes, this does not appear to be carried out. The environmental statements reviewed for this work were collected individually from the conservancies within which they were prepared. Without a centralised repository for these volumes it is unclear as to how monitoring of the overall effectiveness of the environmental impact assessment process can be accomplished. The question of ensuring even application of the environmental impact assessment legislation throughout the country by the various conservancies is also raised if centralised monitoring or audit is not carried out. A central repository would also allow easy access for individuals and organisations outwith the Forestry Commission. In addition to allowing access for academic work such as this, those involved in preparing environmental statements would be able to gain from the experience of previous environmental statement authors, and would hopefully in the long term result in an improvement in the quality of environmental statements.

The main conclusions on the application of the environmental impact assessment process in the British forest sector are:

- The Forestry Commission screening process is insufficiently precise, the results of the review of forest sector environmental statements indicate that projects are being called for assessment where assessment may not be necessary. The results of the screening case studies indicate that there may be instances where false negative and false positive screening decisions are being made;
- The number of false-positive assessments being screened as requiring assessment, and producing an environmental statement, is restricting the development of best practice as the low quality accepted for these cases is then transferred to projects where much more rigorous assessment is necessary;
- While the administration of the assessment process in terms of legislative requirements for notification and deadlines is documented, the management of assessments in terms of screening, scoping, and review is not carried out in a systematic manner by the Forestry Commission and therefore projects could be subject to different treatment depending in which conservancy they are located;
- The lack of guidance on environmental impact assessment available both internally to Forestry Commission staff and externally to practitioners within the forest sector is restricting the development of environmental impact assessment as a useful management tool and the achievement of best practice;
- The failure of the Forestry Commission to initiate a programme of monitoring and auditing of the environmental impact assessment process within the forest sector has meant that the

sector has failed to learn from experience despite the large number of assessments called.

7.5 Environmental Impact Assessments and Environmental Statements

In comparison with other sectors included within the Agricultural sub-category of Annex II of Directive 97/11/EC the forest sector is characterised by a high level of environmental impact assessment activity. When considered at a UK level this constitutes approximately 3% of all environmental impact assessments submitted. However when focusing on the main area of environmental impact assessment activity, Scotland, this becomes 18% of Scottish environmental statements.

7.5.1 Results from the Review of Forest Sector Environmental Statements

The review of environmental statements highlighted the overall poor quality of environmental impact assessment within the forest sector. Of the 89 environmental statements reviewed only one achieved an acceptable grading, all others being below or well below an acceptable standard. The results of the review indicated that forest sector assessments were generally of an inferior quality to those of other sectors and countries Dancey and Lee (1993), McMahon (1996), McGrath and Bond (1997), Hickie and Wade (1998) and Barker and Wood (1999). The review results suggest that similar to Barker and Wood (1999) and Byron, Treweek, Sheate and Thompson (2000) there has been an improvement in quality over time. However the review identified the same general findings of the above works:

Review Area 1
- Baseline data is poor and has failed to explain trends;
- Insufficient coverage of all stages of the project;
- Concentration on too narrow a definition of the area potentially effected.

Review Area 2
- Limited provision of scoping information and little use of tools;
- Methods of prediction and evaluation of impacts not detailed;
- Limited explanation of the methods used to determine impact significance.

Review Area 3
- Lack of detailed coverage of alternatives;
- Lack of monitoring requirements;
- Mitigation methods not described and their efficacy not openly evaluated.

Review Area 4
- Consultation levels low especially public consultation;
- Non-technical summaries poor.

7.5.2 Scoping

Forest sector environmental statements are scoring much lower grades over the four review areas than other UK and European sectors (Barker and Wood, 1999). One of the main reasons for this prevalent low standard was the almost universal failure to adequately scope the

assessment. Until very recently formalised scoping was a process stage rarely regarded as useful or required by Forestry Commission conservancies. This lack of scoping has led to assessments being unfocused. Resources and attention are spread across a wide range of topics rather than only the key issues. Rather than in-depth assessment of a limited number of key issues, environmental statements within the forest sector tend to be superficial treatment of a much larger number of unnecessary ones. The quality and thoroughness of the environmental statements produced was highly variable. Due to the nature of an assessment drawing together information on a wide range of topics, an assessment can cover certain topics well and others less well. This indeed was the case with the sample of environmental statements. Generally however, the environmental statements sampled were poorly prepared and many appeared to be more of a narrative supporting the Woodland Grant Scheme application than information on specific areas of interest that could be used to make a decision. In most cases scoping was restricted to the Forestry Commission standard letter informing a proponent that an assessment would be required for their project. Although most of the reviewed environmental statements acknowledged the concerns of the appropriate bodies contacted by the Forestry Commission these generally appeared to be through written correspondence, none included an open, formalised scoping stage. The general consensus in environmental impact assessment literature is that round-table discussion and direct meetings form the best way to focus on only the most pertinent issues through exchange of views and information (Westman, 1985, Glasson *et al.*, 1994, EC, 2000c). Without a rigorous scoping phase a number of the sampled environmental statements wasted effort on items that were found to be not necessary for the assessment. Providing (or attempting to provide) base line data for elements of the environment that are thought not to be impacted upon by the project is obviously wasteful, but was a surprisingly common trait.

Given the important role of scoping it is therefore not surprising that the review of environmental statements highlighted serious deficiencies in subsequent elements of the assessment process within forest sector environmental statements. With resources being stretched across many elements the provision of data was frequently inadequate. Very few environmental statements contained any quantified information upon which a satisfactory assessment could be based. Subsequent prediction of impacts and determination of impact significance in an open verifiable manner was therefore difficult or impossible in the majority of cases. This weakness was highlighted in Chapter 6 where in order to carry out the partial audit of environmental statements it was first necessary to complete a parallel assessment using the original baseline data. The methodologies through which impacts had been predicted and evaluated and the level of significance determined were not presented in all but a very small minority of environmental statements. The results of the audit demonstrated that although it

had not been carried out in an open and easily verifiable manner some environmental statements had correctly determined impacts as non-significant. Others had failed to identify potentially significant impacts.

7.5.3 Completing the Assessment

The standard of baseline data presented within the environmental statements sampled was generally of poor quality and of little assistance to the assessment process. This situation is similar to that found in those reviewed by Hickie and Wade (1998). While the review noted an improvement in the standard within recent years, in general the environmental statements reviewed did not constitute best practice. Quantified data on the present environmental levels, importance and durability of the environmental elements in question remain the exception rather than the rule. The inclusion of adequate baseline data should allow an improvement in the estimation of the effects of the project and evaluation of the impacts, including estimation of confidence and probability of predictions. While a number of the environmental statements had gathered information this was often of little use to the assessment process or the decision-maker. Exhaustive species lists of flora and fauna were frequently included, some numerated for the project area. Two environmental statements contained close-up photographs of species of *Sphagnum* and *Molinia* which are clearly inappropriate inclusions in an environmental statement. This suggests the author of the environmental statement is unaware of the real purpose of environmental impact assessment and the subsequent environmental statement. As discussed in Chapter 4 the lack of adequate baseline data made subsequent examination and prediction of impact magnitude extremely difficult. In only a very few cases which contained quantified baseline data was any methodical attempt made to evaluate the expected impact, outlining the basis on which the prediction has been made.

The description of the proposed afforestation project should allow the decision maker to obtain quickly an overall view of the work involved, why the project is being carried out, input requirements and possible residues or emissions. Most of the reviewed environmental statements provided adequate descriptions of the project objectives, the forest design and work methods of the proposal. This may be attributed to the fact that this information is required for the Woodland Grant Scheme application and was generally copied directly from the Woodland Grant Scheme application form. Less well covered were the issues of inputs and residues. Although reference was made to planting stock provenances, fertilisers and pesticides were referred to by generic name no attempt was made to account for possible effects from the use of these. Unfortunately the phrase "*guidelines will be adhered to*" was used in a large number of environmental statements when case specific details of how aspects particular to the case in question would have presented a clearer picture to the decision maker of the potential areas of

concern and how the proposals intend to work around these.

A similarity with the work of Barker and Wood (1999) was that the focus of attention in the reviewed environmental statements was firmly in the short term. Discussion was generally restricted to the establishment phase, although in the aspect of landscape and visual effect, projections into the future have been made. However only one environmental statement made any reference to future operations such as thinning or clearfelling and their possible impacts on the area.

The inclusion of alternatives in the environmental statement should allow the decision-maker to judge whether the adoption of one of the options available to the proponent would result in an improved or less harmful overall project. While it is accepted that in many cases the appraisal of alternative sites was not an option, the coverage of alternative uses of the site, methods of working and the reasons for selecting the chosen proposal were in general very inadequate. Almost half of the environmental statements reviewed completely failed to mention alternatives.

The coverage of methods of mitigation was also mixed but generally very poor. While a number of environmental statements provided good descriptions of methods to avoid or reduce impacts just under half the environmental statements in each case made no discrete mentionof mitigation methods, despite their inclusion being mandatory under the environmental impact assessment legislation. Those environmental statements that did were generally rather vague. Only three environmental statements made reference to the existence of post-mitigation residual impacts, and only one of these quantified the residual effect.

In common with the results given by Hickie and Wade (1998) the range of tasks which was most poorly covered was monitoring. This is an important aspect of environmental impact assessment and the only way through which the efficacy of the environmental impact assessment process can ultimately be evaluated (Bissett and Tomlinson, 1988, Sadler, 1988). On a project specific basis, monitoring can also verify that impacts occur as estimated and that proposed mitigation methods are adequate. This will allow initiation of remedial action if deviation from the expected values is encountered. However, very few auditable predictions were identified during the review of forest sector environmental statements, which is in line with the results of Bird's (1996) work in other UK sectors.

On a wider scale an audit of the environmental impact assessment mechanism can ascertain whether or not objectives are being achieved. The importance of a central repository for environmental statements and readily available statistics is central to the success of this process

management. Monitoring allows comparison between predictions and actual outcomes of the project, the impacts and the effects. Within the Woodland Grant Scheme the Forestry Commission pays grant assistance in instalments, prior to each of which a site inspection is made. However this is generally confined to the silvicultural and contract compliance of the proposal for example the completion of ground preparation, planting and aftercare. The Forestry Commission would not monitor, as a matter of routine, elements such as changes in flora or fauna. While the local water authority may monitor water quality in some cases by coincidence, generally no investigation would be made to check if the predicted impacts occurred at the levels described and that the methods of mitigation were adequately coping with these, or if unidentified impacts had occurred. Very few environmental statements included consideration of the impacts or environmental elements which should be monitored, and identified the party responsible for this. Also few environmental statements referred to the frequency or duration of monitoring, the course of action to be followed in event of deviation from the predicted outcome, or made provision for an audit of the environmental impact assessment process. Proponents of afforestation projects may have little to gain individually from an audit of the process, especially if they only ever submit one proposal. However, the larger forestry management companies, the Forestry Commission and the public stand to gain improved assessments and ultimately better afforestation projects, with fewer impacts, if auditing is included in the assessment process.

The form or structure of the sampled environmental statements was very varied. While a limited number allowed pertinent information to be extracted quickly the majority were rather awkwardly written. One objective of the environmental statement is to collect the important information and then present it in an easily understood format. The majority of environmental statements unfortunately held little factual information within the main text, and continually referred the reader to appended figures and details. These were in the main photocopied comments from interested parties or complete reports commissioned for the assessment. The function of the environmental statement is to distill all this information to just the pertinent points and present these in a way easily picked up from the text. For completeness reports and comments may be appended, but the environmental statement author is failing if continual reference to these is necessary to locate basic information. Reports appeared to be commissioned as compartmentalised surveys and not as part of an assessment with the findings presented in the most effective manner for impact assessment. The specialists undertaking these works were rarely used within the impact prediction and determination of impact significance stages. While the inclusion of maps and diagrams were universal these were often of such poor quality reproduction or inappropriate scale to limit their utility. Another aspect in which the environmental statement authors did not account for the backgrounds of the decision-

makers was the inclusion of glossaries or summaries. At present the decision makers are likely to have a forestry background (being Forestry Commission personnel), hence although highly professional these individuals cannot be expected to be expert in all fields and explanations of certain terms and practices may be beneficial.

The basic tenet of an assessment and its environmental statement is that it should be fairly balanced and unbiased. The environmental statement should neither support nor oppose the proposal. The role of the author is to present all the important information, both positive and negative. Within the sampled environmental statements many claims had no foundation other than the authors' own beliefs and were stepping into the realm of the decision making process. It should always be remembered by environmental statement authors that they are providing information with which a decision shall be made; they are not providing evidence in the role of prosecution or defence of the proposal.

The average time taken for a proposal to pass through the environmental impact assessment process, from initial request for assessment to final decision was 60 weeks. However there was considerable variation across Scotland, with the most rapid processing in Lothian requiring on average 45 weeks and the most protracted in Highland which required almost 2 years. The cost of carrying out an assessment was found to be similar to those in other sectors (EC, 1996b) as a percentage of overall costs.

The main conclusions on environmental impact assessments and environmental statements produced within the British forest sector are:

- Despite the large number of assessments called annually the general standard of environmental impact assessment within the forest sector is poor;
- The environmental impact assessments reviewed did not perform adequate, verifiable appraisal of potential impacts in the majority of cases. In most cases the methods through which predictions had been made were not clearly stated;
- Central to the low standard was the recurring failure to adequately address the following issues:
  - Scoping of the assessment;
  - Provision of baseline data including existing trends and referenced information sources;
  - Prediction and evaluation of potential impacts;
  - Determination of impact significance;
  - Mitigation of significant impacts;
  - Consideration of a monitoring programme;
- There is a lack of guidance on the performance of environmental impact assessments and

the preparation of environmental statements in the forest sector;

- The results of the research indicate that projects have been implemented that did contain potentially significant adverse impacts that were not identified within their assessments or mitigated.

7.6 Perceptions of Environmental Impact Assessment

7.6.1 Practitioners, Consultees and Stakeholders

The actors within the environmental impact assessment process can be considered to constitute the Forestry Commission, the proponent and/or environmental statement author, statutory consultees and other stakeholders. The conclusions on the performance of the Forestry Commission were presented in section 7.2.2. However, with 101 environmental impact assessments having completed the process within the forest sector, the Forestry Commission could be considered to be one of the most active and therefore experienced of competent authorities within the UK. The distribution of assessments is such that 97% of assessments are located within Scotland, and almost 50% of these are within one conservancy. Given that assessments are handled at a conservancy level and the absence of any formal mechanism within the Forestry Commission to exchange information on environmental impact assessment practice, there is little opportunity for experience to be shared outwith informal paths. There have been few seminars or training events for Forestry Commission staff on environmental impact assessment and the role of the Forestry Commission as competent authority. Of the 89 environmental statements reviewed almost 70% were prepared under the auspices of one of the three major forest management companies in the UK. However, all of the companies have passed through stages of carrying out all assessments in-house or alternatively employing contract consultants. At present the companies appear to be using a mix of in-house and external staff depending on the complexities of the cases. This has resulted in 50% of environmental statements reviewed being prepared by only four authors. There were however, 28 authors who had completed only one or two environmental statements. This means that there is a wide range of experience of those preparing environmental statements. However the results of the review identified that while the environmental statements prepared by experienced authors were among the highest graded, they were still below what was considered to be an adequate standard in all but one case. The quality of assessments suggests that additional training is required across the range of environmental statement authors. The large number of statements prepared by a small number of individuals implies that considerable improvements to the quality of assessments could be brought about by targeted training programmes. The other group of environmental statement authors with less experience is a much more disparate group which would require careful selection of extension methods to achieve improvement of environmental statements. While the number of college and university courses offering

modules on environmental impact assessment is increasing, there has been a distinct lack of forest sector specific training for existing professionals including Forestry Commission staff. The lack of central provision of training for planning officers was highlighted by Leu, Williams and Bark (1996). Unfortunately this provision within the forest sector has not increased in line with other sectors.

7.6.2 Guidance from the Forestry Commission

The results of the environmental statement questionnaires highlighted the requirements for additional guidance for environmental statement authors. Respondents commented on the need for additional general guidance on environmental impact assessment requirements. Further, the same group identified the need for improved guidance on project specific issues from Forestry Commission staff. While authors were generally supportive of the benefits of scoping there was a level of confusion over who's responsibility it was to carry out the scoping exercise. The results of the review suggest that very few authors were in control of the scoping of their assessment. In general authors allowed the Forestry Commission with input from statutory consultees to dictate the course of the assessment. While the Forestry Commission has a role to play in ensuring projects are adequately scoped the quality of environmental statements reviewed suggests that the Forestry Commission's handling of the scoping of assessments was less that judicious in the majority of cases. The need for environmental statement authors to take an active lead in this process is evident. The lack of the use of tools to assist the process by all groups of actors and the realisation that the potential of scoping is not fully utilised strengthens the findings that scoping is one of the main deficiencies within the system.

7.6.3 The Benefits of Environmental Impact Assessment

In general while most environmental statement authors understood the reasons for, and potential benefits of, environmental impact assessment their experience of current practice suggested continuing unease with the process. In particular environmental statement authors claimed that too many assessments were being requested and much effort was wasted collecting information that was not really required. 40% of respondents considered the resulting environmental statements to be of limited use and that the Forestry Commission was failing to adequately referee the process and were allowing statutory consultees to request elements to be scoped into assessments without adequate justification, often late in the assessment process.

7.6.4 Involving the Public

One of the initial hopes for environmental impact assessment was that it should offer a means by which the general public could have a larger say in the authorisation of development projects. At the same time assessments can supply decision makers with as much information as possible on the proposal and its consequences, so that the decision making process became a

more open system. The environmental statements sampled for this work showed an almost complete absence of the general public from the development of the afforestation proposals. If the public does not hear of the proposal and assessment until the mandatory notice in the press, apart from the possibility of ill-feeling towards the project, a useful resource of information and views is being wasted and the assessment process is not being carried out in the spirit in which it was intended. The Forestry Commission has done little to promote an increased level of public participation within proposals requiring assessment. At present public participation in the assessment process of afforestation projects is minimal. Of the 89 environmental statements reviewed only one made reference to any form of communication with the general public. In this instance the information supplied in the environmental statement was merely the date and location of a meeting with the local community council. No details of the comments made by the general public or their concerns over the afforestation proposals were provided.

The main conclusions on the application of environmental impact assessment in the British forest sector are:

- Environmental impact assessment practitioners, statutory and non-statutory consultees have a range of experience levels, mainly restricted to assessment within the forest sector except for larger bodies with cross-sectoral responsibilities. While a small number of practitioners are experienced in assessment the majority have limited experience of the assessment process;
- Understanding of the principles and practice of environmental impact assessment is generally low as a result of actors' limited exposure to best practice from other sectors;
- The use of tools during scoping or identification of impacts is low among all actors;
- Environmental impact assessment in the forest sector is characterised by very low levels of public involvement and minimal effort by practitioners to identify and consult stakeholders especially during scoping;
- There is generally a degree of mistrust between practitioners and statutory consultees which is restricting the manner in which assessments are carried out and information exchanged during the assessment.

7.7 Implications

7.7.1 Implications for Practice

One of the objectives of this research was to provide examples of good practice which could improve the application of environmental impact assessment within the forest sector. The following sections build on the conclusions and discuss the implications of these on environmental impact assessment practice in the forest sector. However it should be noted that the research identified that it can take 2 years for cases to complete the assessment process.

Therefore while improving action can be initiated immediately it may take many months before the benefits are realised as it would be unrealistic and unfair for assessments already underway to be required to meet any new standards of practice.

7.7.2 Legislative Framework

It can be seen from the previous discussion that a connection can be made between some of the major issues resulting in the poor quality of environmental impact assessment within the forest sector. This link is the sector-wide failure to follow what is now considered to be best practice among practitioners in other sectors. The Forestry Commission's reluctance to ensure full utilisation of scoping and until recently, the absence of independent review of environmental statements together with assessment practitioners' failure to fully scope their assessments, are major limitations on the development of the process, and the preparation of quality environmental statements. With adequate scoping and review ensured by the Forestry Commission the initial and final stages of the process would be closely scrutinised. Therefore the content of assessments and environmental statements could be controlled and through time enhanced. The easiest mechanism for bringing about this change would be to amend current UK environmental impact assessment legislation to include mandatory scoping and review of assessments. However, realistically, the likelihood of revision of legislation is low considering the recent revisions due to Directive 97/11/EC and devolution in Great Britain. Further the UK Government has resolutely held on to the basic format of assessment from the 1988 legislation and withheld from introducing mandatory scoping and review despite repeated wide acceptance that these stages constitute best practice. In addition it would be unlikely for only forestry legislation to be amended and the strength of lobby against the introduction of mandatory scoping and review from other sectors could be considerable. Therefore if changes are to be made to the forest sector process to include scoping and review these will have to be introduced unilaterally by the Forestry Commission in the form of internal and sectoral guidance. This could ensure that environmental statement authors are strongly advised to carry out adequate scoping and are assisted (at least in the short term) to do this. In addition the Forestry Commission's internal procedures would have to be developed to ensure that systems to control scoping and review were implemented.

7.7.3 Screening

The research highlighted a number of issues regarding the screening process which was seen to require strengthening as instances of false positive and false negative screening were found. In addition the research concluded that Forestry Commission screening is requiring too many assessments to be undertaken. One of the main criticisms of the Forestry Commission screening process is that it is generally left to the discretion of the conservancy and ultimately

the individual officer. There is currently no systematic method through which proposals can be screened. At present therefore no official records are maintained of the reasons for screening decisions. The subsequent audit of the validity of the Forestry Commission's screening decision is therefore difficult and the opportunity to improve the process through experiential learning is lost. In addition without a systematic and documented procedure through which the decision can be verified the Forestry Commission is open to challenge that the screening decision was not appropriately carried out. The matrices used within the screening case studies could act as the basis for a systemised screening process. However provision of additional guidance on screening seems necessary in order to ensure all conservancies screen with equal rigour as discrepancies in screening decisions between conservancies and staff were noted during the research.

7.7.4 Scoping

The discussion in Section 7.3.1.1 suggested that the Forestry Commission should ensure that assessments are adequately scoped. Since legislative changes are unlikely, action by the Forestry Commission is essential. The simplest part of this would be the issuance of internal guidance for officers requiring that adequate scoping must be carried out for all assessments. This process could follow that initiated by Highland conservancy where round-table scoping meetings have been used on a regular basis since 1997. In order to ensure a consistent approach further guidance and training is required for staff on the role of the Forestry Commission as 'referee' within the process ensuring adequate scoping but without placing undue burden on projects. This training should include the introduction of tools such as checklists, matrices and networks to assist the scoping process. However to ensure that best practice is being implemented the Forestry Commission must advocate that scoping goes beyond merely identifying those issues that should be included within the assessment. The Forestry Commission should encourage the use of the scoping meeting to set the allowable parameters of the assessment. Hence scoping should be utilised to provide advice and direction on suitable survey methods, impact prediction models and thresholds of significance. If the key actors within the process can agree on the minimum requirements of the assessment in terms of baseline data and the analytical methods to be employed the quality of the resulting assessments should improve.

The responsibility for carrying out the task of scoping remains with the proponent. The Forestry Commission must therefore provide some form of extension or capacity building for environmental statement authors which provides training on the means through which the Forestry Commission's requirements for scoping can be achieved. It is believed to be essential that the Forestry Commission adopts a pro-active approach to this issue, perhaps taking a high

profile stance initially to raise awareness amongst all actors that existing practice and performance of scoping must be improved and leading these actors through the requirements of the new process. It should be remembered that the majority of actors within the forest sector have little or no experience of environmental impact assessment in other sectors. The forest sector model is therefore the only one known and improvements in performance will only be achieved through the injection of new techniques and ideas. Once practice has been improved the Forestry Commission can lessen its input and resume the normal role of competent authority. Considering the fact that the majority of assessments are carried out by the three main forest management companies or their consultants the re-education of the main actors should not be difficult. The extension to statutory consultees may be more problematic due to the geographical spread of bodies such as Scottish Natural Heritage or English Nature and the number of individual staff involved across the UK. However this should not be insurmountable with strategic and tactical briefings and the inclusion of staff within Forestry Commission chaired scoping meetings.

7.7.5 Environmental Statement Review

In tandem with appropriate scoping the inclusion of adequate review of environmental statements is felt to be key to ensuring improvements within environmental impact assessment in the forest sector. Until 1997 when the researcher was contracted to complete the review of a number of environmental statements there had been no formalised review process within the sector. The decision on whether or not to accept the environmental statement was left entirely to the conservancy and ultimately the individual officer. There had been no guidance on how reviews should be undertaken and what qualities constituted an acceptable environmental statement. Whether or not the review is carried out in-house or is out-sourced, the Forestry Commission must initiate the review of all environmental statements within the sector. In addition the Forestry Commission must formalise this process to ensure level application across the country. The review checklist developed for this research could provide the basis for this review system. The benefits of a formal system with documented procedures and results would be similar to those derived from formal screening and scoping where decisions and results could be audited to allow revision of the process as a whole.

In implementing a formal system for environmental statement review the Forestry Commission should ensure that the risk of conflicts of interest arising are minimised. As noted earlier, Forestry Commission staff have a number of roles to play within the sector. These roles may be increased temporarily within the assessment process if the Forestry Commission adopts a pro-active approach to improving scoping. The involvement of individual staff within an assessment could in these cases be considerable. In order to ensure an appropriate level of

impartiality it would therefore be prudent for the Forestry Commission to ensure independent review through staff unconnected with the proposal. Within a conservancy this may be difficult where a number of individuals could be involved in complex cases. It is therefore suggested that either environmental statements are transferred for review to another conservancy or a Forestry Commission review panel is assembled to review cases on a regional or national basis. In either case a systematic process of review must be followed. While the conservancy-based review maintains experience within the conservancies, the panel approach would allow the inclusion of independent reviewers who could bring experience from other sectors. Whichever method is selected by the Forestry Commission it would be essential for the process to be afforded the option to return a statement for amendment and to re-review prior to final acceptance. Provision should also be made to allow reviewers access to the full case files including records of scoping meetings and consultees comments at least until the quality of information included within forest sector environmental statements improves. In order to improve the quality and quantity of public involvement within the review process the Forestry Commission should consider placing draft environmental statements on their public register web-site.

7.7.6 Monitoring

Unlike other areas of Forestry Commission activity such as the Woodland Grant Scheme there has been no formal internal review of performance of environmental impact assessment within the forest sector despite the considerable activity in particular by the Forestry Commission as competent authority. One of the reasons for this may be that due to the lack of systematic procedures for the environmental impact assessment process (other than time deadlines) the application of an audit, that is performance against a standard or achievement of objectives, is difficult to implement. However as a competent authority whose activity constitutes one fifth of all assessments within Scotland the Forestry Commission must initiate a programme of monitoring and review to ensure environmental impact assessment within the forest sector is fit for this purpose.

The need for monitoring within individual assessments is apparent if the assessment process is to be 'closed'. Without monitoring on an individual project basis the estimates and predictions surrounding impacts and their significance are unchecked. In particular involved stakeholders and consultees are at risk of alienation if monitoring is not carried out. Stakeholders should be able to expect that their efforts within the assessment process will result in the agreed activities being acted upon. If there is no follow-up, the incentive to participate and invest resources is very much reduced. Hence the Forestry Commission should ensure through the environmental statement review process in particular that individual assessments include adequate programmes

which identify issues, resources, techniques and responsibilities for monitoring exercises. While this may be seen as an unnecessary expense by proponents the principle of the 'polluter pays' should apply. The environmental impact assessment is only a reasoned guess at future results and it is essential, particularly in cases where confidence in predictions is low, for proponents to assume responsibility for ensuring that actual impacts at least match those levels presented within their environmental statements.

The application of monitoring at a sectoral level is dependent to a certain extent on the inclusion of monitoring programmes within individual assessments. The potential benefits from and responsibilities for sectoral monitoring rests with the sector as a whole. However as competent authority the Forestry Commission should play a lead role in this especially as it will require initiation of programmes to monitor internal performance. Monitoring at this level can be seen as having two main elements, procedural and technical. Procedural monitoring should focus on the application of environmental impact assessment within the sector. Issues should include:

- The level of assessment activity and consistency of application on a conservancy basis;
- Compliance with Forestry Commission formal systems for screening, scoping and review;
- Adequacy of internal Forestry Commission and sectoral guidance;
- Utility of information for the decision making process.

Technical monitoring should focus on the collective use of monitoring within individual assessments in an effort to identify whether or not appropriate tools and techniques are being used and are providing acceptable results. Issues should include:

- Adequacy of baseline studies;
- Accuracy of impact identification;
- Accuracy of impact predictions;
- Efficacy of mitigation methods.

Only through the adoption of adequate monitoring at individual assessment and sectoral levels will the environmental impact assessment process continue to develop. Through the capture and dissemination of elements of best practice the quality of assessments will improve. The monitoring and feedback loop is seen as vital in any modern managerial system including forest management best practice as noted in the FSC Principles and Criteria (FSC, 1993) and the UK Woodland Assurance Scheme (UKWASSG, 2000). The Forestry Commission and others in the forest sector should take steps to resolve the absence of monitoring from the process as soon as possible.

7.7.7 Environmental Impact Assessments and Environmental Statements

Through the implementation of the measures discussed throughout this section it is hoped that

the quality of assessments and environmental statements would be raised. However there is a need for all actors involved to raise their standards of application in regard to assessments and environmental statements. Standards are low. The forest sector must accept this and make efforts to improve output to at least a level comparable with the average in the UK. As discussed previously there is a need for sector specific guidance on the completion of assessments and the preparation of environmental statements. The Forestry Commission should prioritise the publication of the long awaited guideline. In addition the following elements are seen as important considerations when assessments are carried out and statements prepared:

- Full details of scoping should be provided including comments from consultees and lists of stakeholders who have been afforded the opportunity to contribute to the assessment;
- Elements which are scoped out of the assessment should be identified and the reasons for their exclusion stated, the use of 'Finding Of No Significant Impact' (FONSI) statements should be considered;
- Baseline data should be quantified and provided only for those elements seen as potentially impacted and the methods used to collect this data should be identified;
- Methods used for impact prediction and evaluation should be clearly stated to allow verification, the methodologies used do not have to be state of the art however they should have a reasonable scientific basis that takes account of relevant considerations;
- The methods used to determine impact significance should be stated and should include the quantification of a threshold of concern;
- Where mitigation methods are proposed these should be supported by quantification of their efficacy and any residual impact should be identified and its significance stated;
- The members of the assessment team should be identified and brief details of their qualifications and experience should be provided;
- Information sources should be adequately referenced.

7.7.8 Consultation

While limited consultation does take place during assessments the archetypal situation is one of brief contact with statutory consultees at the beginning of the process when an assessment has been called followed by long periods without consultation while the assessment is carried out until the merits of the environmental statement are argued over. The level of public involvement is generally low or non-existent. For environmental impact assessment to work this combative approach must be stopped and a more integrative approach fostered by all actors. By formalising scoping and having the terms of reference for the assessment agreed at the start the risk of proponents feeling consultees are hijacking the process for their own ends, or consultees feeling that proponents are implementing a less than rigorous or impartial assessment

should be reduced. A more open and integrated communication of requirements and information can only assist in improving the quality of assessments. In particular proponents should ensure that stakeholders are identified and contacted early in the preparation of a proposal. Rather than seeing environmental impact assessment as an external process expedited by the Forestry Commission, proponents should adopt the ethos of environmental impact assessment into project design. Through this potential issues can be identified and mitigated before they become an impact in the formal assessment process. The greater the level of initial consultation the less likelihood of a proposal being called for assessment, if screening takes adequate recognition of comments of stakeholders who have been involved in the development of the proposal. Proponents should note that this process does require time and resources. However, this can be weighed against the cost of having to carry out an assessment. In line with current developments such as certification and long term forest planning all actors must develop mechanisms to increase the level of public involvement through all stages of the assessment process from screening to post-implementation monitoring.

With guidance and support from the Forestry Commission environmental impact assessment practitioners should ensure that:

- A pro-active approach is taken to public consultation and not assume that the public will actively seek information without initial contact first being made by the proponent;
- Consultation must include organised and non-organised groups;
- Consultation begins at the earliest opportunity and at the very latest as part of the scoping process. The inclusion of consultation at project initiation may identify potential impacts which could be addressed and therefore not require formal assessment;
- An approach should be taken to resolve conflict between consultees even if this means doing more than what is required as a minimum by legislation.

7.7.9 Training

Although it is over 12 years since the introduction of environmental impact assessment legislation, the inclusion of environmental impact assessment as subject in college and university forestry courses is still rather limited. In-depth coverage of the subject appears to be limited to specialised environmental management courses or secondary degrees. Within the Forestry Commission, training of officers in the function and processes of environmental impact assessment appears to have been minimal with individual conservancies and officers by default allowed to set their own standards. To raise the efficacy of the Forestry Commission as the competent authority a training programme should be initiated as soon as possible. In the short term the standard of environmental impact assessment could be raised by workshops and short courses for those involved in the sector in the assessment process. In the long term the

inclusion of environmental impact assessment as a subject in college and university courses would raise the awareness of the sector as a whole.

7.8 Limitations of the Research

The limitations inherent within this work have been previously identified and result from two main sources:

- The low response rates of Forestry Commission staff within the screening case studies exercise;
- The limited number of auditable impact predictions which could be utilised during the investigation of the standards of assessment.

Within the screening case studies only 7 responses were received from the six Scottish conservancies. A sample of 10% is relatively limited and does not allow full investigation into the differences in screening practice between conservancies. The results do however indicate that screening decisions are not uniform within Forestry Commission conservancies or between them.

As with other studies the incidence of auditable impact predictions within the environmental statements reviewed was found to be very low mainly due to inadequacies of initial baseline data. The rarity of auditable impact predictions was compounded by the almost universal failure to provide any details on the methods through which impacts had been predicted and significance determined. The review of environmental statements found no cases which could be audited in their original form. Only two elements were found to have more than one project which included information which could be audited, and in all cases only then after carrying out a re-assessment using the original baseline data as details of the original methodologies including thresholds of concern were not provided. The range of elements investigated and the number of replicates was therefore low. However this part of the research was wholly dependent on the quality of the information provided within the original environmental statements. Within the investigation of landscape impacts due to the original assessments restricting impact identification to the long term impacts the comparison of predicted versus actual landscape impact will not be possible for many decades. However the research highlighted that short term impacts had occurred that were not identified in the original assessment. Further the absence of verifiable techniques within the environmental statements was not due to their non-availability, rather the failure of the statement author to use readily existing techniques and the failure of the Forestry Commission to demand that these were included within the assessment.

7.9 Implications for Further Research

From the results of the research the following topics have been identified as warranting further investigation which was outside the scope of this work:

- Application of the environmental statement review checklist within other countries which have similar plantation-type afforestation such as Ireland, South Africa, Costa Rica, Chile and Argentina;
- Investigation of the utility of the information presented within environmental statements within the decision making process and the effect of that information on the final decision;
- Research into the availability of cost-effective methods for identifying non-statutory stakeholders and consultees together with techniques for adequately consulting with them throughout the assessment process.

REFERENCES

Ahmad Y, Sammy G (1985) *Guidelines to Environmental Impact Assessment in Developing Countries.* Hodder & Stroughton. Sevenoaks.

Andrews R (1976) *Environmental Policy and Administrative Change.* D.C. Heathand Company. Toronto.

Arts J (1998) *EIA Follow Up. On the Role of Ex Post Evaluation in Environmental Impact Assessment.* Geo Press. Groningen.

Asian Development Bank (1995) *North West Frontier Province. Forest Sector Project Summary Initial Environmental Examination.* ADB. Manila.

Atholl Estate (1995) *Ardchattan Environmental Statement.* Atholl Estate. Perth.

Atkinson N, Ainsworth R (1992) Environmental Assessment and the Local Authority. Facing the European Imperative. *Environmental Policy and Planning.* **2**(2): 111-128.

Atkinson S, Bhatia S, Schoolmaster F, Waller W (2000) Treatment of Biodiversity Impacts in a Sample of US Environmental Impact Statements. *Impact Assessment and Project Appraisal.* **18**(4): 271-282.

Baah W (1995) *The Development of an Environmental Impact Assessment Procedure for Forest Harvesting in Ghana (A Case Study).* Unpublished MSc dissertation, University of Edinburgh.

Baker A (1994) Environmental Statements: How to Maintain Rigour and Impartiality when Making Recommendations. *Environmental Assessment Magazine. 2(1): 23-24.*

Barker A, Wood C (1999) An Evaluation of EIA System Performance in Eight EU Countries. *Environmental Impact Assessment Review.* **19**(4): 387-404.

Barnes P, Barnes I (1999) *Environmental Policy in the European Union.* Edward Elgar. Cheltenham.

Beanlands G, Duinker P (1983) *An Ecological Framework for Environmental Impact Assessment.* Institute for Resource and Environmental Studies. Dalhousie University. Nova Scotia.

Beattie (1995) Everything You Already Knew About EIA (But Don't Often Admit). *Environmental Impact Assessment Review.* **15**(2): 109-114.

Bell S (1993) *The Elements of Visual Design in the Landscape.* Spon. London.

Bell Ingram (1990) *Auchtertyre Environmental Statement.* Bell Ingram. Inverness.

Bell Ingram (1993a) *Invercassley Environmental Statement.* Bell Ingram. Inverness.

Bell Ingram (1993b) *Invercharron Environmental Statement.* Bell Ingram. Inverness.

Bell Ingram (1994a) *Glencassley Environmental Statement.* Bell Ingram. Inverness.

Bell Ingram (1994b) *Arscaig Environmental Statement.* Bell Ingram. Inverness.

Berkes F (1988) The Intrinsic Difficulty of Predicting Impacts: Lessons from the James Bay Hydro Project. *Environmental Impact Assessment Review.* **8**: 201-220.

Bird A (1996) *Auditing Environmental Impact Statements Using Information Held in Public Registers of Environmental Information.* Working Paper 165. School of Planning Oxford Brookes University. Oxford.

Bird A, Therivel R (1996) Post-auditing of Environmental Impact Statements Using Data Held in Public Registers of Environmental Information. *Project Appraisal.* **11**: 105-116.

Bissett R (1979) Quantification, Decision Making and Environmental Impact Assessment in the United Kingdom. *Journal of Environmental Management.* **7**(1): 43-58.

Bissett R (1980) Methods for Environmental Impact Analysis. Recent Trends and Future Prospects. *Journal of Environmental Management.* **11**(1): 27-43.

Bissett R (1984) Methods for Assessing Direct Impacts. In B Clark, A Gilad, R Bissett, P Tomlinson (eds.) *Perspectives on Environmental Impact Assessment.* Reidel. Dordrecht.

Bissett R (1995) *EIA: A Guide to Good Practice.* Second Draft Prepared for the Environment and Economics Unit. United Nations Environment Programme.

Bissett R, Tomlinson P (1988) Monitoring and Auditing of Impacts. In P Wathern (ed.) *Environmental Impact Assessment: Theory and Practice.* Unwin Hyman. London.

Biswas A, Geping Q (Eds.) (1985) *Environmental Impact Assessment for Developing Countries.* United Nations University. London.

Bojorquez-Tapia L, Garcia D (1998) An Approach for Evaluating EIAs – Deficiencies of EIA in Mexico. *Environmental Impact Assessment Review.* **18**(3): 217-240.

Bond R, Curran J, Kirkpatrick C, Lee N, Francis P (2001) Integrated Impact Assessment for Sustainable Development. *World Development.* **29**(6): 1011-1024.

Bowlts (1997) *Riddorroch Estate Environmental Statement.* Bowlts. Inverness.

Bowyer J (2001) Environmental Implications of Wood Production in Intensively Managed Plantations. *Wood and Fiber Science.* **33**(3):318-333.

Buckley R (1991) Auditing the Precision and Accuracy of Environmental Impact Predictions in Australia. *Environmental Impact Assessment Review.* **11**: 1-23.

Burchell J (1996) *Explorations in Planning Theory.* Centre for Urban Policy Research. New Jersey.

Bryon H, Treweek J, Sheate W, Thompson S (2000) Road Developments in the UK: An Analysis of Ecological Assessment in Environmental Impact Statements Produced Between 1993 and 1997. *Journal of Environmental Planning and Management.* **43**(1): 71-97.

Canadian Environmental Assessment Agency (1997) *International Study of the Effectiveness of Environmental Assessment.* CEAA. Canada.

Canter L (1994) *Environmental Impact Assessment.* McGraw-Hill. New York.

Cantril H (1944) *Gauging Public Opinion.* Princeton University Press. Princeton.

Catlow J, Thirlwall C (1976) *Environmental Impact Analysis: A Study Prepared for the Secretaries of State for the Environment, Scotland and Wales.* Department of the Environment. London.

Chadwick A, Glasson J (1999) Auditing the Socio-economic Impacts of a Major Construction Project: the Case of Sizewell B Nuclear Power Station. *Journal of Environmental Planning and Management.* **42**(6): 811-836.

Clark B (1984) Environmental Impact Assessment: Scope and Objectives. In B Clark (ed.) *Perspectives on Environmental Impact Assessment,* Reidel. Dordrecht.

Clark M (1988) The Role of Environmental Impact Assessment in the Planning Process.

Clark R (2000) Making EIA Count in Decision-Making. In M Partidário and R Clark (eds.) *Perspectives on Strategic Environmental Assessment.* Lewis. New York.

Coakes S, Fenton M, Gabriel M (1999) Application of Repertory Grid Analysis in Assessing Community Sensitivity to Change in the Forest Sector. *Impact Assessment and Project Appraisal.* **17**(3): 193-202.

Coles T, Fuller K, Slater M (1992) *Practical Experience of Environmental Assessment in the UK.* Institute of Environmental Assessment. Lincs.

Colley R, Lee N (1990) Reviewing the Quality of Environmental Statements. *The Planner.* **76**(16): 12-14.

Colley R, Raymond K (1994) *Environmental Impact Assessment Review Checklist.* Report written for the Directorate General for Environment, Nuclear Safety and Civil Protection of the Commission of the European Communities. Brussels.

Converse J (1986) *Survey Questions: Handcrafting the Standardised Questionnaire.* Sage. London.

Council for Environmental Quality (1978) National Environmental Policy Act Implementation of Procedural Provisions: Final Regulations. *Federal Register.* **43**(230). Washington.

Commission of the European Communities (1982) *European Parliament Official Journal.* No 1-280/245. Commission of the European Communities. Brussels.

Commission of the European Communities (1985) Council Directive of 27 June 1985. On the Assessment of the Effects of Certain Public and Private Projects on the Environment. *Official Journal of the European Communities.* L175. CEC. Brussels.

Commission of the European Communities (1993a) *Implementation of the Directive 85/337/EEC on the Assessment of the Effects of Certain Public and Private Projects on the Environment.* COM (93) 28 Final. CEC. Brussels.

Commission of the European Communities (1993b) *Report for the Commission of the Implementation of Directive 85/337/EEC.* COM 93(88). CEC. Brussels.

Commission of the European Communities (2001a) *Proposal for a Directive of the European Parliament and of the Council Providing Public Participation in Respect of the Drawing Up*

of Certain Plans and Programmes Relating to the Environment and Amending Council Directives 85/337/EEC and 96/61/EC. COM 2000 839 Final. CEC. Brussels.

Commission of the European Communities (2001b) Directive 2001/42/EC of the European Parliament and of the Council on the Assessment of the Effects of Certain Plans and Programmes on the Environment. *Official Journal of the European Communities.* L197. CEC Brussels.

Countryside Commission (1987) *Landscape Assessment: A Countryside Commission Approach.* Countryside Commission. Cheltenham.

Countryside Commission (1988) *A Review of Recent Practice and Research in Landscape Assessment.* Countryside Commission. Cheltenham.

Countryside Commission (1991) *Environmental Assessment: the Treatment of Landscape and Countryside Issues.* Countryside Commission. Cheltenham.

Countryside Commission (1993) *Landscape Assessment: a New Guidance.* Countryside Commission. Cheltenham.

Court of Justice of the European Communities (1998) Opinion of the Advocate General. *Case C-392/96. Commission v Ireland.*

Court of Justice of the European Communities (1999) Judgement of the Court (Fifth Chamber). *Case C-392/96. Commission v Ireland.*

Czaja R, Blair J (1996) *Designing Surveys. A Guide to Decisions and Procedures.* Pine Forge Press. Thousand Oaks. California.

Dancey R, Lee N (1993) A Comparison of the Quality of Environmental Impact Statements in Ireland and the UK. *Environmental Management Ireland.* **1**(2): 21-28.

Del Furia L, Wallace-Jones J (2000) The Effectiveness of Provisions and Quality of Practices Concerning Public Participation in EIA in Italy. *Environmental Impact Assessment Review.* **20**(4): 457-479.

Department of the Environment (1987) *An Assessment of the Environmental Effects of Energy Forestry.* Energy Technology Supply Unit. Harwell.

Department of the Environment (1988) *Environmental Assessment.* Circular (15/88). HMSO. London.

Department of the Environment (1989) *Environmental Assessment: A Guide to the Procedures.* HMSO. London.

Department of the Environment (1994a) *Environmental Assessment: Amendment of Regulations.* Circular 7/94. HMSO. London.

Department of the Environment (1994b) *Evaluation of Environmental Information for Planning Projects – A Good Practice Guide.* HMSO. London.

Department of the Environment (1994c) *Biodiversity. The UK Action Plan.* HMSO. London.

Department of the Environment (1996) *Preparation of Environmental Statements for Planning Projects that Require Environmental Assessment —A Good Practice Guide.* HMSO. London.

Department of Environment, Transport and the Regions (1997) *Mitigation Measures in Environmental Statements.* HMSO. London.

Department of Environment, Transport and the Regions (1998a) *Opportunities for Change.* Consultation Paper on a Revised UK Strategy for Sustainable Development. DETR. London.

Department of Environment, Transport and the Regions (1998b) *Review of Technical Guidance on Environmental Appraisal.* HMSO. London.

Department of Environment, Transport and the Regions (2000) *Environmental Impact Assessment, A Guide to Procedures.* HMSO. London.

Department of Trade and Industry (1992) *Guidance on Environmental Assessment of Cross-Country Pipelines.* DTI.

Department of Transport (1994) *The Design Manual for Roads and Bridges – Environmental Assessment.* Vol. 11.

Dipper B, Jones C, Wood C (1998) Monitoring and Post-auditing in Environmental Impact Assessment: A Review. *Journal of Environmental Planning and Management.* **41**(6): 731-747.

Dixon J, Montz B (1995) From Concept to Practice: Implementing CIA. *Environmental Management,* **19**(3): 445-456.

Eccleston C (1999) *The NEPA Planning Process. A Comprehensive Guide with Emphasis on Efficiency.* John Wiley & Sons. New York.

Eccleston C (2000) The Decision-Identification Tree: A New NEPA Scoping Tool. *Environmental Management.* **26**(4): 457-464.

Economou N (1992) Problems in Environmental Policy Creation: Tasmania's Wesley Valley Pulp Mill Dispute. In *Australian Environmental Policy,* K Walker (Ed.). NSW University Press. Kensington, NSW.

Elkin T, Smith P (1988) What is a Good Environmental Impact Statement? Reviewing Screening Reports from Canada's National Parks. *Journal of Environmental Management,* **26**: 71-89.

Erickson P (1979) Environmental Impact Assessment Principles and Design. Academic Press. New York.

Erickson P (1994) A Practical Guide to Environmental Impact Assessment. Academic Press. London.

European Commission (1995a) *Environmental Impact Assessment: Guidance on Screening.* Directorate General for Environment, Nuclear Safety and Civil Protection. EC. Brussels.

European Commission (1995b) *Environmental Impact Assessment: Guidance on Scoping.* Directorate General for Environment, Nuclear Safety and Civil Protection. EC. Brussels.

European Commission (1996a) *Environmental Assessment Review Checklist.* Directorate General for Environment, Nuclear Safety and Civil Protection. EC. Brussels.

European Commission (1996b) *Environmental Impact Assessment in Europe. A Study of Costs and Benefits.* EC. Brussels.

European Commission (1996c) *Evaluation of the Performance of the EIA Process.* EC (DGXI). Brussels.

European Commission (1997) Council Directive 97/11/EC of 3 March 1997 Amending Directive 85/337/EEC on the Assessment of Effects of Certain Public and Private Projects on the Environment. *Official Journal of the European Communities.* L73.

European Commission (2000a) *Guide for Environmental Appraisal in Forest Sector Development Co-operation Parts I/1 and I/2.* DG Development. Brussels.

European Commission (2000b) *Towards Sustainable Economic and Development Co-operation Environmental Integration Manual.* DG Development. Brussels.

European Commission (2000c) *Interim Report: Public Participation and Consultation in EIA and SEA.* ERM. London.

Fieldhouse K (1993) Question Time. *Landscape Design.* **218**: 15-18.

Fink A, Kosecoff J (1998) *How to Conduct Surveys. A Step-by-Step Guide.* Sage Publications Inc. Thousand Oaks. California.

Finlayson Hughes (1996) Ardverikie Environmental Statement. Finlayson Hughes. Inverness.

Forest Industry Committee of Great Britain (1998) *Handbook 1998. A Reference to the Forest Industry.* FICGB. Stirling.

Forest Stewardship Council (1993) *Principles of Forest Management.* Forest Stewardship Council. Oaxaca.

Forestry Authority (1993) *Environmental Assessment of New Woodlands.* HMSO. Edinburgh.

Forestry Authority (1994) *Sustainable Forestry. The UK Programme.* HMSO. Edinburgh.

Forestry Commission (1991a) *Forestry Policy for Great Britain: September 1991.* HMSO. Edinburgh.

Forestry Commission (1991b) *Forestry Facts and Figures 1989-90.* HMSO. Edinburgh.

Forestry Commission (1992) *The Forestry Authority: A Framework for Growth.* HMSO. Edinburgh.

Forestry Commission (1995) Forestry Practice Guide: Preparing an Environmental Statement. Internal draft document. HMSO. Edinburgh.

Forestry Commission (1998a) *UK Forestry Standard, The Government's Approach to Sustainable Forestry.* HMSO. Edinburgh.

Forestry Commission (1998b) Extracts from the Grants and Licences Woodland Grant Scheme Database. (Unpublished). Forestry Commission. Edinburgh.

Forestry Commission (1998c) *Forestry Commission Facts and Figures 1997-98.* HMSO. Edinburgh.

Forestry Commission (1999a) *England Forestry Strategy. A New Focus for England's Woodlands.* Forestry Commission. Cambridge.

Forestry Commission (1999b) *Annual Reports and Accounts. Forestry Commission 1998 – 1999.* HMSO. Edinburgh.

Fortlage C (1990) *Environmental Assessment A Practical Guide.* Gower Publishing Company. Aldershot.

Fountain Forestry (1990a) *Bhealaich Environmental Statement.* Fountain Forestry. Banbury.

Fountain Forestry (1990b) *The Hope Environmental Statement.* Fountain Forestry. Banbury.

Fowler F (1995) *Improving Survey Questions: Design and Evaluation.* Sage. London.

Francis P, Jacobs S (1999) Institutionalising Social Analysis at the World Bank.*Environmental Impact Assessment Review.* **19**(3): 341-357.

Frost R (1994) Project Design Beyond Environmental Impact Statements. In R Therivel (ed.) *Issues In Environmental Impact Assessment.* Working Paper No 144. School of Planning. Oxford Brookes University. Oxford.

George C (1999) Testing for Sustainable Development Through Environmental Assessment. *Environmental Impact Assessment Review.* **19**(2): 175-200.

George C (2000) Environmental Impact Prediction and Evaluation. In N Lee and C George (eds.) *Environmental Assessment in Developing and Transitional Countries: Principles, Methods and Practice.* John Wiley and Sons Ltd. Chichester.

Gillham W (2000) *Developing a Questionnaire.* Continuum. London.

Gilpin A (1995) *Environmental Impact Assessment: Cutting Edge for the Twenty-first Century.* Cambridge University Press. Cambridge.

Glasson J (1992) *An Introduction to Regional Planning.* UCL Press. London.

Glasson J (1995) Socio-economic Impacts 1: Overview and Economic Impacts. In P Morris and R Therivel (eds.) *Methods of Environmental Impact Assessment.* UCL Press. London.

Glasson J (1999) The First 10 Years of the UK EIA System: Strengths, Weaknesses, Opportunities and Threats. *Planning Practice and Research.* **14**(3): 363-375.

Glasson J, Heaney D (1993) Socio-economic Impacts: the Poor Relations in British EISs. *Journal of Environmental Planning and Management.* **36**(3): 335-343.

Glasson G, Salvador N (2000) EIA in Brazil: A Procedures-Practice Gap. A Comparative Study With Reference to the European Union, and Especially the UK. *Environmental Impact Assessment Review.* **20**(2): 191-225.

Glasson J, Therivel R, Chadwick A (1994) *Introduction to Environmental Impact Assessment.* University College London Press, London.

Glasson J, Therivel R, Chadwick A (1999) *Introduction to Environmental Impact Assessment*, 2nd edition. University College London Press, London.

Gray I (1996) *Environmental Impact Assessment in the Scottish Forest Sector.* Unpublished MSc Dissertation. University of Edinburgh. Edinburgh.

Gray I, Edwards-Jones G (1999) Environmental Impact Assessment in the Scottish Forest Sector. *Forestry.* **72**(1): 1-10.

Green B (1981) *Countryside Conservation. The Protection and Management of Amenity Ecosystems.* Allen and Unwin. London.

Grigal D, Bates P (1997) Assessing Impacts of Forest Harvesting – The Minnesota Experience. *Biomass & Bioenergy.* **13**(4-5): 213-222.

Goodey B (1995) Landscape. In P Morris and R Therivel (eds.) *Methods of Environmental Impact Assessment.* UCL Press. London.

Goodland R, Edmundson V (eds.) (1994) *Environmental Assessment and Development.* The World Bank. Washington.

Goodstadt V (1990) *Indicative Forestry Strategies, The Scottish Experience.*

Guilianpour K, Sheate W (1997) A Systematic Review of Tanzanian Environmental Impact Statements. *Project Appraisal.* **12**(3): 138-150.

Hague P (1993a) *Interviewing.* Kogan Page. London.

Hague P (1993b) *Questionnaire Design.* Kogan Page. London.

Hague P, Jackson P (1998) *Do Your Own Market Research.* Kogan Page. London.

Hall J (1994) *West Willows Environmental Statement.* J.J. Hall Environmental. Driffield.

Halsbury (2000) *Statutes of England and Wales.* Butterworths. London.

Hankinson M (1999) Landscape and Visual Impact Assessment. In Petts J (Ed.) *Handbook of Environmental Impact Assessment Volume 1. Environmental Impact Assessment:Process, Methods and Potential.* Blackwell Science. Oxford.

Harrop D, Nixon J (1999) *Environmental Assessment in Practice.* Routledge. London.

Hart S (1984) The Costs of Environmental Review. In S Hart (ed.) *Improving Impact Assessment.* Westview Press. Colorado.

Harvey N (1998) *Environmental Impact Assessment Procedures, Practice and Prospects in Australia.* OUP. Melbourne.

Her Majesty's Government (1988a) *The Town and Country Planning (Assessment of Environmental Effects) Regulations 1988.* Statutory Instrument 1199. HMSO. London.

Her Majesty's Government (1988b) *The Environmental Assessment (Scotland) Regulations 1988.* Statutory Instrument 1221. HMSO. London.

Her Majesty's Government (1988c) *The Environmental Assessment (Afforestation) Regulations 1988.* Statutory Instrument 1207. HMSO. London.

Her Majesty's Government (1998) *The Environmental Assessment (Forestry) Regulations 1998.* Statutory Instrument 1731. HMSO. London

Her Majesty's Government (1999a) *The Town and Country Planning (Environmental Impact Assessment) Regulations 1999* Statutory Instrument 293. HMSO. London.

Her Majesty's Government (1999b) *Environmental Impact Assessment (Forestry) (England and Wales) Regulations 1999.* Statutory Instrument 2228. HMSO. London.

Hickie D, Wade M (1998) Development of Guidelines for Improving the Effectiveness of Environmental Assessment. *Environmental Impact Assessment Review.* **18**(3): 267-287.

Hollick M (1981) The Role of Quantitative Decision-Making Methods in Environmental Impact Assessment. *Journal of Environmental Management.* **12**(1): 65-78.

Ibrahim A (1992) *An Analysis of Quality Control in the Malaysian Environmental Impact Assessment Process.* Unpublished MSc Dissertation. University of Manchester. Manchester.

Institute of Environmental Assessment and Landscape Institute (1994). *Guidelines for Landscape and Visual Assessment.* Spon. London.

International Institute for Environment and Development (1995) *A Directory of Impact Assessment Guidelines.* IIED. London.

International Union for Conservation of Nature and Natural Resources (1993) *Manual on Environmental Assessment for Sustainable Forest Development.* IUCN. Gland.

Jain R, Urban V, Stacey G (1977) *Environmental Impact Analysis. A New Dimension in Decision Making.* Van Nostrand Reinhold Company. New York.

Jain R, Urban V, Stacey G, Balbach H (1993) *Environmental Assessment.* McGraw-Hill. New York.

Jones C, Lee N, Wood C (1991) *UK Environmental Statements 1988-1990: An Analysis.* Occasional Paper 29. University of Manchester. Manchester.

Jones C, Wood C (1995) The Impact of Environmental Impact Assessment on Public Enquiry Decisions. *Journal of Planning and Environmental Law.* October: 890-904.

Jones C, Bull T (1997) Analysis of Changing Trends in United Kingdom Environmental Statements. *Journal of Planning and Environmental Law.* December 1997: 1091-1103.

Jones C, Wood C, Dipper B (1998) Environmental Assessment in the UK Planning Process: A Review of Practice. *Town Planning Review.* **69**(3): 315-339.

Johnson S, Corcelle G (1989) *The Environmental Policy of the European Communities.* Graham & Trotman. London.

Kirkwood G (1992) The Evolution of Community Environmental Policy. *Environmental Policy and Practice.* **2**(2): 183-198.

Lane L, Hoffeld S, Griffin D (1998) Environmental Justice Evaluation – Wilmington Bypass, Wilmington, North Carolina. *Environmental and Social Effects of Transportation, Transportation Research Record.* **1626**: 131-139.

Langton C (1991) *Glen Derby Environmental Statement.* Atholl Estate. Perth.

Langton C (1994) *Glen Bruar Environmental Statement.* Atholl Estate. Perth.

Lee N (1987) *Environmental Impact Assessment: A Training Guide.* Occasional Paper 18, Department of Town and Country Planning. University of Manchester. Manchester.

Lee N, Brown D (1992) Quality Control in Environmental Assessment. *Project Appraisal,* 7(1): 41-45.

Lee N, Colley R (1992) *Reviewing the Quality of Environmental Statements.* Occasional Paper 24. Department of Planning, University of Manchester. Manchester.

Lee N, Colley R, Bond J, Simpson J (1999) *Reviewing the Quality of Environmental Statements and Environmental Appraisal.* Occasional Paper No 55. Department of Planning and Landscape. University of Manchester. Manchester.

Lee N, Dancey R (1993) The Quality of Environmental Statements in Ireland and the United Kingdom: a Comparative Analysis. *Project Appraisal,* **8**(1): 31-36.

Lee N, Walsh F (1992) Strategic Environmental Assessment: An Overview. *Project Appraisal.* 7(2): 126-136.

Lee N, Walsh F, Reeder G (1994) Assessing the Performance of the Environmental Process. *Project Appraisal,* 9(3): 161-172.

Lee N, Wood C (1985) Training for Environmental Impact Assessment Within the European Economic Community. *Journal of Environmental Management.* **21**: 271-286.

Lee, N (2000) Reviewing the Quality of Environmental Assessment. In N Lee and C George (eds.) *Environmental Assessment in Developing and Transitional Countries: Principles, Methods and Practice.* John Wiley and Sons Ltd. Chichester.

Leu W, Williams W, Bark A (1995) An Evaluation of the Implementation of Environmental Assessment by UK Local Authorities. *Project Appraisal.* **10**(2): 91-102.

Leu W, Williams W, Bark A (1996) Quality Control Mechanisms and Environmental Impact Assessment Effectiveness with Special Reference to the UK. *Project Appraisal.* **11**(1): 2-12.

Lewis J (1988) Economic Impact Analysis: a UK Literature Survey and Bibliography.*Progress in Planning.* **30**(3): 161-209.

Lichfield N (1992a) The Integration of Environmental Assessment into Development Planning: Part 1, Some Principles. *Project Appraisal.* 7(2): 58-66.

Lichfield N (1992b) Environmental Impact Assessment in Project Appraisal in Britain. *Project Appraisal.* 7(3): 175-185.

Lowden F (2000) *An Evaluation of the Changing Approach to Environmental Impact Assessment in the UK Forestry Sector With Particular Regard to Ecological Issues.* Unpublished MA Dissertation. School of Planning and Landscape. University of Manchester.

Lucas O (1991) *The Design of Forest Landscapes.* OUP. Oxford.

Mao W, Hills P (2000) Environmental Impact Assessment, Strategic Assessment and Sustainable Development. *China Environmental Science*. **20**: 90-94.

Marriott B (1997) *Environmental Impact Assessment: A Practical Guide.* McGraw-Hill. New York.

Mason T, Roper A, Porter A (1999) Integrating Environmental Consequences and Impact Assessment Into Design Processes and Corporate Strategy. *Impact Assessment and Project Appraisal.* **17**(2): 141-145.

Mather A (1993) *Afforestation: Policies, Planning and Progress.* Belhaven Press. London.

Marquis K (1972) *Reporting Health Effects in Household Interviews: Effects of Reinforcement, Question Length and Re-interview.* National Centre for Health Studies. Washington.

MacKay J (1993) *Phillips Mains Environmental Statement.* Strath House. Watten.

McCormack A, O'Leary T (1993) Classification of Landscape Sensitivity for Visual Impact Assessment. *Irish Forestry.* **50**(1): 1-12.

McGrath C, Bond A (1997) The Quality of Environmental Impact Statements: A Review of Those Submitted in Cork, Eire from 1988-1993. *Project Appraisal.* **12**(1): 43-52.

McMahon N (1996) Quality of Environmental Statements Submitted in Northern Ireland in Relation to the Disposal of Waste on Land. *Project Appraisal.* **11**(2): 85-94.

McNicholl I (1981) Estimating Regional Industry Multipliers: Alternative Techniques. *Town Planning Review.* **55**(1): 80-88.

Mills J (1992) *The Adequacy of Visual Impact Assessment in Environmental Statements.* In R Therivel (Ed.). *Issues in Environmental Impact Assessment. Working Paper No 144.* School of Planning. Oxford Brookes University. Oxford.

MIRENEM (undated) *Borrador de Guia de Estudio de Impacto Ambiental Para Explotatión de Cauces Dominio Público.* (Draft Guide for Environmental Impact Studies of Public Watersheds). Comisión Gubernamental de Control y Evaluación de Estudios de Impacto Ambiental, Ministerio de Recursos Naturales. Costa Rica.

Mitchell A (1994) *Hill of Foudland Environmental Statement.* Mitchwood Forestry Services. Inverness.

Monnikhof R, Edelenbos J (2001) Into the Fog? Stakeholder Input in Participatory Impact Assessment. *Impact Assessment and Project Appraisal.* **19**(1): 29-39.

Morgan R (1983) The Evolution of Environmental Impact Assessment in New Zealand. *Journal of Environmental Management.* **16**(2): 139-152.

Morris P, Therivel R (eds.) (1995) *Methods of Environmental Impact Assessment.* University College London Press Ltd. London.

Mulvihill P, Jacobs P (1998) Using Scoping as a Design Process. *Environmental Impact Assessment Review.* **18**(4): 351-370.

Munn R (1975) Environmental Impact Assessment Principles and Procedures. Wiley. Toronto.

Mwalyosi R, Hughes R (1998) *The Performance of EIA in Tanzania: an Assessment.* Environmental Planning Issues 14. International Institute for Environment and Development. London.

Nelson P (1993) Separating Design from Assessment. *Landscape Design.* **224**: 23-24.

Nicholls D, Sclater A (1993) Cutting Quality Down to Scale. *Landscape Design.* **218**: 39-41.

Nitz T, Holland I (2000) Does Environmental Impact Assessment Facilitate Environmental Management Activities? *Journal of Environmental Assessment Policy and Management.* **2**(1): 1-17.

Noble B (2000) Strengthening EIA Through Adaptive Management: A Systems Perspective. *Environmental Impact Assessment Review.* **20**(1): 97-111.

Norton G (1984) *Resource Economics.* Edward Arnold. London.

Oakley P, Pratt B, Clayton A (1998) *Outcomes and Impact: Evaluating Change in Social Development.* INTRAC. Oxford.

O'Brien M (2000) *Making Better Environmental Decisions: An Alternative to Risk Assessment.* Environmental Research Foundation. London.

Office for National Statistics (1998) *How Exactly is Employment Measured?* Office for National Statistics. London.

Organisation for Economic Cooperation and Development (1979) *Environmental Impact Assessment. Analysis of the Environmental Consequences of Significant Public and Private Projects.* Organisation for Economic Cooperation and Development. Paris.

Organisation for Economic Cooperation and Development (1992) *Good Practices for Environmental Impact Assessment of Development Projects.* OECD Development Assistance Committee Guidelines on Environment and Aid (1). Organisation for Economic Cooperation and Development. Paris.

O'Riordan T, Hey R (1976) *Environmental Impact Assessment.* Saxon House. Farnborough.

Ortega-Rubio A, Salinas-Zavala L, Lluch-Cota D, Troyo-Dieguez E (2001) A New Method to Determine the Level of Environmental Impact Assessment Studies in Mexico. *Environmental Impact Assessment Review.* **21**(1): 73-81.

Overseas Development Administration (1996) *Manual of Environmental Appraisal.* O.D.A. London.

Parrott N, Moyes A (1997) A Delphi Evaluation of the Environmental Impacts of Road Building. *Environmental Policy and Practice.* **7**(1): 21-32.

Pastakia C, Jensen A (1998) The Rapid Impact Assessment Matrix (RIAM) for EIA. *Environmental Impact Assessment Review.* **18**(3): 461-482.

Payne S (1951) *The Art of Asking Questions.* Princeton University Press. Princeton.

Preece R (1991) *Designs on the Landscape.* Pinter. London.

Priestnall G, Haines-Young R, Ward N (1993) The Use of GIS in Forest Design. *Mapping Awareness and GIS in Europe.* **7**(2): 110-125.

Ratcliffe D, Oswald P (1987) *Birds, Bogs and Forestry. The Peatlands of Caithness and Sutherland.* Nature Conservancy Council. Peterborough.

Rau J (1980) Concepts of Environmental Impact Analysis. In J Rau and D Wooten (eds.) *Environmental Impact Analysis Handbook.* McGraw-Hill. New York.

Rees C (1999) Improving the Effectiveness of Environmental Assessment in the World Bank. *Environmental Impact Assessment Review.* **19**(3): 333-339.

Roche C (1999) *Impact Assessment for Development Agencies: Learning to Value Change.* Oxfam GB. Oxford.

Rodgers J (1976) *Environmental Impact Assessment, Growth Management and the Comprehensive Plan.* Ballinger. Cambridge, MA.

Rodriguez E (1999) Environmental Impact Assessment in Spain: A Critical Review. *European Law Review.* **8**(8-9): 234-243.

Roe D, Dalal-Clayton B, Hughes R (1998) *A Directory of Impact Assessment Guidelines.* IIED. London.

Ross W (1987) Evaluating Environmental Impact Statements. *Journal of Environmental Management.* **25**(2): 137-147.

Rout D (1994) An Analysis of the EIA Process and EIA Reports Produced for Selected Industrial Developments in the State of Orissa in India. Unpublished MSc Dissertation. University of Manchester. Manchester.

Royal Institute of Chartered Surveyors (1982) *Forestry and Land Use.* GCPA Report.

Sadler B (1988) The Evaluation of Assessment: post EIA research and process. In P Wathern (ed.) *Environmental Impact Assessment,* Unwin Press. London.

Sadler B (1994) *Proposed Framework for the International Study of the Effectiveness of Environmental Assessment.* Federal Environmental Review Office, Canada; and the International Association of Impact Assessment.

Sadler B (1996) *Environmental Assessment In a Changing World: Evaluating Practice to Improve Performance.* Final Report of the International Study of the Effectiveness of Environmental Assessment. Ministry of Supply and Services. Ottawa.

Sadler B, Verheem R (1997) *Country Status Reports on Environmental Impact Assessment: Results of an International Study.* EIA Commission. Utrecht.

Sapsford R (1999) *Survey Research.* Sage Publications Ltd. London.

Schumpeter J (1943) *The Theory of Economic Development: An Enquiry into Profits, Capital, Credit, Interest and the Business Cycle.* Transl. By R. Opie. Harvard University Press. Mass.

Scottish Development Department (1988) *Environmental Assessment: Implementation of EC Directive: The Environmental Assessment (Scotland) Regulations 1988.* Circular 13/88. HMSO. Edinburgh.

Scottish Executive (1999a) *The Environmental Impact Assessment (Scotland) Regulations 1999.* Scottish Statutory Instrument 1. HMSO. Edinburgh.

Scottish Executive (1999b) *The Environmental Impact Assessment (Forestry) (Scotland) Regulations 1999.* Scottish Statutory Instrument 43. HMSO. Edinburgh.

Scottish Executive (1999c) *The Environmental Impact Assessment (Scotland) Regulations 1999.* Circular 15/1999. HMSO. Edinburgh.

Scottish Executive (1999d) *Indicative Forestry Strategies Circular 9/1999.* HMSO. Edinburgh.

Scottish Executive (2000) *Agricultural Facts and Figures 2000.* Scottish Executive Rural Affairs Department. Edinburgh.

Scottish Office (1990) *Environmental Assessment: a Guide.* HMSO. Edinburgh.

Scottish Office (1995) *Scottish Economic Bulletin.* HMSO. Edinburgh.

Scottish Office (1996) *Scottish Economic Bulletin.* HMSO. Edinburgh.

Scottish Office (1997) *Scottish Economic Bulletin.* HMSO. Edinburgh.

Scottish Office (1998) *The Scottish Environment Statistics 1998.* HMSO. Edinburgh.

Scottish Office (1999) *Scottish Economic Bulletin.* HMSO. Edinburgh.

Scottish Office Environment Department (1994) *The Environmental Assessment (Scotland) Amendment Regulations 1994.* Circular 26/1994. HMSO. Edinburgh.

Scottish Woodlands Ltd (1993a) *Wandell Hill Environmental Statement.* Scottish Woodlands Ltd. Edinburgh.

Scottish Woodlands Ltd (1993b) *Strathconnon Environmental Statement.* Scottish Woodlands Ltd. Edinburgh.

Scottish Woodlands Ltd (1993c) *Southdean Farm Environmental Statement.* Scottish Woodlands Ltd. Edinburgh.

Scottish Woodlands Ltd (1993d) *Castle Hill Environmental Statement.* Scottish Woodlands Ltd. Edinburgh.

Scottish Woodlands Ltd (1993e) *Blackmount Environmental Statement.* Scottish Woodlands Ltd. Edinburgh.

Scottish Woodlands Ltd (1994) K*inlocheacuis Environmental Statement.* Scottish Woodlands Ltd. Edinburgh.

Scottish Woodlands Ltd (1995a) *Traboyack Farm Environmental Statement.* Scottish Woodlands Ltd. Edinburgh.

Scottish Woodlands Ltd (1995b) *Ardtaraig Environmental Statement.* Scottish Woodlands Ltd. Edinburgh.

Scottish Woodlands Ltd (1995c) *The Biallaid Environmental Statement.* Scottish Woodlands Ltd. Edinburgh.

Scottish Woodlands Ltd (1996) *Strone Environmental Statement.* Scottish Woodlands Ltd. Edinburgh.

Secretary of State for Scotland (1996) *More Openness and Less Bureaucracy for Forestry Proposals.* Answer to Parliamentary Question 9 May 1996.

Shand D (1992) *Bishop Hill Environmental Statement.* Highland Woodlands. Contin.

Shoard M (1980) *The Theft of the Countryside.* Temple Smith. London.

Shopley J, Fuggle R (1984) A Comprehensive Review of Current Environmental Impact Assessment Methods and Techniques. *Journal of Environmental Management.* **18**: 25-47.

Simpson J (2001) Developing a Review Package to Assess the Quality of EIA Reports of Local Authority Structural and Local Plans in the UK. *Environmental Impact Assessment Review.* **21**(1): 83-95.

Singleton R, Castle P, Short D (1999) *Environmental Assessment.* Thomas Telford. London.

Slater W (1995) Sustainability for Australia: A National Environmental Information System. *Proceedings from the National Conference of the Institute of Engineers.* Australia.

Slootveg R, Vanday F, van Schooten M (2001) Functional Evaluation as a Framework for the Integration of Social and Environmental Impact Assessment. *Impact Assessment and Project Appraisal.* **19**(1): 19-28.

Societe Generale de Surveillance (1999) *Forest Enterprise Main Assessment Report Vols I-IV.* SGS QUALIFOR. Oxford.

Stamps A (1997) A Paradigm for Distinguishing Significant from Non-Significant Visual Impacts: Theory, Implementation, Case Histories. *Environmental Impact Assessment Review.* **17**(4): 249-293.

Steinemann A (2001) Improving Alternatives for Environmental Impact Assessment. *Environmental Impact Assessment Review.* **21**(1): 3-21.

Stewart-Oaten A, Bence J (2001) Temporal and Spatial Variation in Environmental Impact Assessment. *Ecological Monographs.* **71**(2): 305-339.

Sudman S, Bradburn N (1982) *Asking Questions.* Jossey-Bass. London.

Sudman S, Bradburn N (1988) *Polls and Surveys: Understanding What They Tell Us.* Jossey-Bass. London.

Sullivan W, Kuo F, Prabhu M (1997) Communicating With Citizens: The Power of Photosimulations and Simple Editing. *Environmental Impact Assessment Review.* **17**(4): 295-310.

Tilhill Economic Forestry (1992) *Inverchoalin Environmental Statement.* Tilhill Economic Forestry. Stirling.

Tilhill Economic Forestry (1994a) *Beinn Leamhain Environmental Statement.* Tilhill Economic Forestry. Stirling.

Tilhill Economic Forestry (1994b) *Finnart and Invercomrie Environmental Statement.* Tilhill Economic Forestry. Stirling.

Tilhill Economic Forestry (1996a) *Glen Uig Environmental Statement.* Tilhill Economic Forestry. Stirling.

Tilhill Economic Forestry (1996b) *Wester Guisachan Environmental Statement.* Tilhill Economic Forestry. Stirling.

Tilhill Economic Forestry (1996c) *Creagan Breac Glenroy Environmental Statement.* Tilhill Economic Forestry. Stirling.

Therivel R, Wilson E, Thompson S, Heaney D, Pritchard D (1992) *Strategic Environmental Assessment.* Earthscan. London.

Therivel R (2001) Landscape. In Morris P, R Therivel (Eds.) *Methods of Environmental Impact Assessment.* Spron Press. London.

Tomlinson P (1989) Environmental Statements: Guidance for Review and Audit. *The Planner.* **75**(28): 12-15.

Treweek J (1996) Ecology and Environmental Impact Assessment. *Journal of Applied Ecology.* **33**(2): 191-199.

Turnbull R (1984) EIA in the Planning Process. A Scottish Overview. In B Clark, A Gilad, R Bissett, P Tomlinson (eds.) *Perspectives on Environmental Impact Assessment.* D Reidel Publishing Co. Dordrecht.

Turner T (1998) *Landscape Planning and Environmental Impact Design.* UCL Press. London.

Tzoumis K, Finegold L (2000) Looking at the Quality of Draft Environmental Impact Statements Over Time in the United States: Have Ratings Improved? *Environmental Assessment Review.* **20**(5): 557-578.

United Kingdom Woodland Assurance Scheme Steering Group (2000) *Certification Standard for the UK Woodland Assurance Scheme.* HMSO. London.

United Nations Conference on Environment and Development (1992a) *Earth Summit - Agenda 21: The United Nations Programme of Action From Rio.* United Nations. New York.

United Nations Conference on Environment and Development (1992b) *Rio Declaration on Environment and Development.* UNCED. New York.

United Nations Conference on Environment and Development (1992c) *Non-Legally Binding Authoritative Statement of Principles for a Global Consensus on the Management, Conservation and Sustainable Development of All Types of Forests.* UNCED. New York.

United Nations Environment Programme (1988) *Environmental Impact Assessment: Basic Procedures for Developing Countries.* UNEP. Nairobi.

United States Forest Service (1997a) *Final Environmental Assessment. Four Cutter Vegetative Management Project.* USFS. Michigan

United States Forest Service (1997b) *Sleepy Pond Vegetation Management Project Environmental Assessment.* USFS. Michigan.

United States Forest Service (1997c) *Slope Lake Vegetative Management Environmental Assessment.* USFS. Michigan.

Usher P (2000) Traditional Ecological Knowledge in Environmental Assessment and Management. *Arctic.* **53**(2): 183-193.

Vasconcelos C, Hamilton A, Barrett P (2000) Public Participation in EIA: A Study from a Portuguese Perspective. *Journal of Environmental Assessment Policy and Management.* **2**(4): 561-582.

Vig N, Kraft M (1994) *Environmental Policy in the 1990s.* C.Q. Press. Washington.

Walker K (1992) *Australian Environmental Policy.* NSW University Press. Kensington NSW.

Wallace D, Shalkowski J (1998) Post-National Environmental Policy Act Monitoring of Environmental Impacts and Mitigation Commitments. *Environmental and Social Effects of Transportation, Transportation Research Record.* **1626**: 31-37.

Wathen D (1992) *Beinn Chreagach Environmental Statement.* Inverness.

Wathern P (1988) *Environmental Impact Assessment: Theory and Practice.* Unwin Hyman Ltd. London.

Waugh N (1996) *Queensberry Environmental Statement.* Buccleuch Estate. Dumfries.

Welford R (1996) Environmental Issues and Corporate Environmental Management. In R Welford (ed.) *Corporate Environmental Management* Earthscan. London.

Westman W (1985) *Ecology, Impact Assessment and Environmental Planning.* Wiley. New York.

Weston J (1995) *Screening, Scoping and ES Review Under the 1999 EIA Regulations.* Working Paper 184. School of Planning. Oxford Brookes University. Oxford.

Weston J, Glasson J, Therivel R, Wilson E, Frost R (1997) Environmental Statements, Environmental Information, Environmental Assessment and the UK Planning Process. *Project Appraisal.* **12**(4): 233-242.

Weston J (2000) Consultants in the EIA Process. *Environmental and Waste Management.* **5**(3): 210-221.

Wibberley G (1960) Conflicts in Land Use. In *Natural Resources in Scotland Symposium: Royal Society of Edinburgh.* The Scottish Council. Edinburgh.

Willis K, Garrod, (1993) Valuing Landscape: A Contingent Valuation Approach. *Journal of Environmental Management.* **37**(1): 1-22.

Wilson L (1998) A Practical Method for Environmental Impact Assessment Audits. *Environmental Impact Assessment Review.* **18**(1): 59-71.

Wood C (1989) *Environmental Impact Assessment: Five Training Case Studies.* EIA Centre. Department of Planning and Landscape. University of Manchester. Manchester.

Wood C (1995) *Environmental Impact Assessment: A Comparative Review.* Longman Group Ltd. Harlow.

Wood C, Lee N, Jones C (1991) Environmental Statements in the United Kingdom: the Initial Experience. *Project Appraisal.* 6(4): 187-195.

Wood C (2000) Screening and Scoping. In N Lee and C George (eds.) *Environmental Assessment in Developing and Transitional Countries: Principles, Methods and Practice.* John Wiley and Sons Ltd. Chichester.

Wood C, Dipper B, Jones C (2000) Auditing the Assessment of the Environmental Impacts of Planning Projects. *Journal of Environmental Planning and Management.* 43(1): 23-47.

Wood G (1999a) Assessing Techniques of Assessment: Post-development Auditing of Noise Predictive Schemes in Environmental Impact Assessment. *Impact Assessment and Project Appraisal.* 17(3): 217-226.

Wood G (1999b) Post-development Auditing of EIA Predictive Techniques: A Spatial Analytical Approach. *Journal of Environmental Planning and Management.* 42(5): 671-689.

Wood G, Bellanger C (1999) *Directory of Environmental Impact Statements.* Working Paper No. 179. School of Planning, Oxford Brookes University. Oxford.

Wood G (2000a) Ten Years On: An Empirical Analysis of UK Environmental Statement Submissions Since the Implementation of Directive 85/337/EEC. *Journal of Environmental Planning and Management.* 43(5): 721-747.

Wood G (2000b) Is What You See What You Get? Post-development Auditing of Methods Used for Predicting the Zone of Visual Influence in EIA. *Environmental Impact Assessment Review.* 20(5): 537-556.

World Bank (1989) *Operational Directive 4.00, Annex A: Environmental Assessment. The World Bank Operational Manual.* The World Bank. Washington.

World Bank (1991a) *Environmental Assessment Sourcebook. Volume I Policies, Procedures, and Cross-Sectoral Issues.* The World Bank. Washington.

World Bank (1991b) *Environmental Assessment Sourcebook. Volume II Sectoral Guidelines.* The World Bank. Washington.

World Bank (1991c) *Environmental Assessment Sourcebook. Volume III Guidelines for Environmental Assessment of Energy and Industry Projects.* The World Bank. Washington.

World Bank (1999) *The World Bank Operational Manual.* The World Bank. Washington.

APPENDICES

APPENDIX 1

1.1 COUNCIL DIRECTIVE 85/337 of June 27, 1985 On the Assessment of the Effects of Certain Public and Private Projects

1.2 Environmental Assessment (Afforestation) Regulations 1988

1.3 Environmental Impact Assessment (Forestry) (Scotland) Regulations 1999

COUNCIL DIRECTIVE 85/337 of June 27, 1985 On the Assessment of the Effects of Certain Public and Private Projects on the Environment

(Published in the Official Journal of the European Communities, 5th July 1995, page L 175/40)

THE COUNCIL OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Economic Community, and in particular Articles 100 and 235 thereof,

Having regard to the proposal from the Commission,

Having regard to the opinion of the European Parliament,

Having regard to the opinion of the Economic and Social Committee,

Whereas the 1973 and 1977 action programmes of the European Communities on the environment, as well as the 1983 action programme, the main outlines of which have been approved by the Council of the European Communities and the representatives of the Governments of the Member States, stress that the best environmental policy consists in preventing the creation of pollution or nuisances at source, rather than subsequently trying to counteract their effects; whereas they affirm the need to take effects on the environment into account at the earliest possible stage in all the technical planning and decision-making processes; whereas to that end, they provide for the implementation of procedures to evaluate such effects;

Whereas the disparities between the laws in force in the various Member States with regard to the assessment of the environmental effects of public and private projects may create unfavourable competitive conditions and thereby directly affect the functioning of the common market; whereas, therefore, it is necessary to approximate national laws in this field pursuant to Article 100 of the Treaty;

Whereas, in addition, it is necessary to achieve one of the Community's objectives in the sphere of the protection of the environment and the quality of life;

Whereas, since the Treaty has not provided the powers required for this end, recourse should be had to Article 235 of the Treaty;

Whereas general principles for the assessment of environmental effects should be introduced with a view to supplementing and co-ordinating development consent procedures governing public and private projects likely to have a major effect on the environment;

Whereas development consent for public and private projects which are likely to have significant effects on the environment should be granted only after prior assessment of the likely significant environmental effects of these projects has been carried out; whereas this assessment must be conducted on the basis of the appropriate information supplied by the developer, which may be supplemented by the authorities and by the people who may be concerned by the project in question;

Whereas the principles of the assessment of environmental effects should be harmonised, in particular with reference to the projects which should be subject to assessment, the main obligations of the developers and the content of the assessment;

Whereas projects belonging to certain types have significant effects on the environment and these projects must as a rule be subject to systematic assessment;

Whereas projects of other types may not have significant effects on the environment in every case and whereas these projects should be assessed where the Member States consider that their characteristics so require;

Whereas, for projects which are subject to assessment, a certain minimal amount of information must be supplied, concerning the project and its effects;

Whereas the effects of a project on the environment must be assessed in order to take account of concerns to protect human health, to contribute by means of a better environment to the quality of life, to ensure maintenance of the diversity of species and to maintain the reproductive capacity of the ecosystem as a basic resource for life;

Whereas, however, this Directive should not be applied to projects the details of which are adopted by a specific act of national legislation, since the objectives of this Directive, including that of supplying information, are achieved through the legislative process;

Whereas, furthermore, it may be appropriate in exceptional cases to exempt a specific project from the assessment procedures laid down by this Directive, subject to appropriate information being supplied to the Commission,

HAS ADOPTED THIS DIRECTIVE:

Article 1

1. This Directive shall apply to the assessment of the environmental effects of those public and private projects which are likely to have significant effects on the environment.

2. For the purposes of this Directive:

"project" means:

- the execution of construction works or of other installations or schemes;
- other interventions in the natural surroundings and landscape including those involving the extraction of mineral resources;

"developer" means:

the applicant for authorisation for a private project or the public authority which initiates a project;

"development consent" means:

the decision of the competent authority or authorities which entitles the developer to proceed with the project;
3. The competent authority or authorities shall be that or those which the Member States designate as responsible for performing the duties arising from this Directive.
4. Projects serving national defence purposes are not covered by this Directive.
5. This Directive shall not apply to projects the details of which are adopted by a specific act of national legislation, since the objectives of this Directive, including that of supplying information, are achieved through the legislative process.

Article 2

1. Member States shall adopt all measures necessary to ensure that, before consent is given, projects likely to have significant effects on the environment by virtue, inter alia, of their nature, size or location are made subject to an assessment with regard to their effects.
These projects are defined in Article 4.
2. The environmental impact assessment may be integrated into the existing procedures for consent to projects in the Member States, or, failing this, into other procedures or into procedures to be established to comply with the aims of this Directive.
3. Member States may, in exceptional cases, exempt a specific project in whole or in part from the provisions laid down in this Directive.
In this event, the Member States shall:
(a) consider whether another form of assessment would be appropriate and whether the information thus collected should be made available to the public;
(b) make available to the public concerned the information relating to the exemption and the reasons for granting it;
(c) inform the Commission, prior to granting consent, of the reasons justifying the exemption granted, and provide it with the information made available, where appropriate, to their own nationals.
The Commission shall immediately forward the documents received to the other Member States.
The Commission shall report annually to the Council on the application of this paragraph.

Article 3

The environmental impact assessment will identify, describe and assess in an appropriate manner, in the light of each individual case and in accordance with the Articles 4 to 11, the direct and indirect effects of a project on the following factors:
- human beings, fauna and flora,
- soil, water, air, climate and the landscape,
- the inter-action between the factors mentioned in the first and second indents,
- material assets and the cultural heritage.

Article 4

1. Subject to Article 2(3), projects of the classes listed in Annex I shall be made subject to an assessment in accordance with Articles 5 to 10.
2. Projects of the classes listed in Annex II shall be made subject to an assessment, in accordance with Articles 5 to 10, where Member States consider that their characteristics so require.
To this end Member States may inter alia specify certain types of projects as being subject to an assessment or may establish the criteria and/or thresholds necessary to determine which of the projects of the classes listed in Annex II are to be subject to an assessment in accordance with Articles 5 to 10.

Article 5

1. In the case of projects which, pursuant to Article 4, must be subjected to an environmental impact assessment in accordance with Articles 5 to 10, Member States shall adopt the necessary measures to ensure that the developer supplies in an appropriate form the information specified in Annex III inasmuch as:
(a) the Member States consider that the information is relevant to a given stage of the consent procedure and to the specific characteristics of a particular project or type of project and of the environmental features likely to be affected;
(b) the Member States consider that a developer may reasonably be required to compile this information having regard inter alia to current knowledge and methods of assessment.
2. The information to be provided by the developer in accordance with paragraph 1 shall include at least:
- a description of the project comprising information on the site, design and size of the project,
- a description of the measures envisaged in order to avoid, reduce and, if possible, remedy significant adverse effects,
- the data required to identify and assess the main effects which the project is likely to have on the environment,
- a non-technical summary of the information mentioned in indents 1 to 3.
3. Where they consider it necessary, Member States shall ensure that any authorities with relevant information in their possession make this information available to the developer.

Article 6

1. Member States shall take the measures necessary to ensure that the authorities likely to be concerned by the project by reason of their specific environmental responsibilities are given an opportunity to express their opinion on the request for development consent. Member States shall designate the authorities to be consulted for this purpose in general terms or in each case when the request for consent is made. The information gathered pursuant to Article 5 shall be forwarded to these authorities. Detailed arrangements for consultation shall be laid down by the Member States.
2. Member States shall ensure that:

- any request for development consent and any information gathered pursuant to Article 5 are made available to the public,
- the public concerned is given the opportunity to express an opinion before the project is initiated.

3. The detailed arrangements for such information and consultation shall be determined by the Member States, which may in particular, depending on the particular characteristics of the projects or sites concerned:
- determine the public concerned,
- specify the places where the information can be consulted,
- specify the way in which the public may be informed, for example by bill-posting within a certain radius, publication in local newspapers, organisation of exhibitions with plans, drawings, tables, graphs, models,
- determine the manner in which the public is to be consulted, for example, by written submissions, by public enquiry,
- fix appropriate time limits for the various stages of the procedure in order to ensure that a decision is taken within a reasonable period.

Article 7

Where a Member State is aware that a project is likely to have significant effects on the environment in another Member State or where a Member State likely to be significantly affected so requests, the Member State in whose territory the project is intended to be carried out shall forward the information gathered pursuant to Article 5 to the other Member State at the same time as it makes it available to its own nationals. Such information shall serve as a basis for any consultations necessary in the framework of the bilateral relations between two Member States on a reciprocal and equivalent basis.

Article 8

Information gathered pursuant to Articles 5, 6 and 7 must be taken into consideration in the development consent procedure.

Article 9

When a decision has been taken, the competent authority or authorities shall inform the public concerned of:
- the content of the decision and any conditions attached thereto,
- the reasons and considerations on which the decision is based where the Member States' legislation so provides.

The detailed arrangements for such information shall be determined by the Member States.

If another Member State has been informed pursuant to Article 7, it will also be informed of the decision in question.

Article 10

The provisions of this Directive shall not affect the obligation on the competent authorities to respect the limitations imposed by national regulations and administrative provisions and accepted legal practices with regard to industrial and commercial secrecy and the safeguarding of the public interest.

Where Article 7 applies, the transmission of information to another Member State and the reception of information by another Member State shall be subject to the limitations in force in the Member State in which the project is proposed.

Article 11

1. The Member States and the Commission shall exchange information on the experience gained in applying this Directive.

2. In particular, Member States shall inform the Commission of any criteria and/or thresholds adopted for the selection of the projects in question, in accordance with Article 4(2), or of the types of projects concerned which, pursuant to Article 4(2), are subject to assessment in accordance with Articles 5 to 10.

3. Five years after notification of this Directive, the Commission shall send the European Parliament and the Council a report on its application and effectiveness. The report shall be based on the aforementioned exchange of information.

4. On the basis of this exchange of information, the Commission shall submit to the Council additional proposals, should this be necessary, with a view to this Directive's being applied in a sufficiently co-ordinated manner.

Article 12

1. Member States shall take the measures necessary to comply with this Directive within three years of its notification. (This Directive was notified to the Member States on July 3, 1985.)

2. Member States shall communicate to the Commission the texts of the provisions of national law which they adopt in the field covered by this Directive.

Article 13

The provisions of this Directive shall not affect the right of Member States to lay down stricter rules regarding scope and procedure when assessing environmental effect.

Article 14

This Directive is addressed to the Member States.

Done at Luxembourg, June 27, 1985.

Annex I

This lists the projects subject to Article 4(1), namely those projects which shall be made subject to an assessment, ie an assessment is obligatory. It includes the construction of "motorways" and "express roads."

For the purposes of the Directive, "express road" means a road which complies with the definition in the European Agreement on main international traffic arteries of November 15, 1975, published in the UK in 1977 as a Command Paper (Cmnd. 6993).

Annex II

This lists the projects subject to Article 4(2), namely those projects which shall be made subject to an assessment where Member States consider that their characteristics so require, ie an assessment is optional. It includes the construction of "roads" (no further definition is given).

Annex III

Information referred to in Article 5(1)

1. Description of the project, including in particular:

- a description of the physical characteristics of the whole project and the land-use requirements during the construction and operational phases,
- a description of the main characteristics of the production processes, for instance, nature and quantity of the materials used,
- an estimate, by type and quantity, of expected residues and emissions (water, air and soil pollution, noise, vibration, light, heat, radiation etc.) resulting from the operation of the proposed project.

2. Where appropriate, an outline of the main alternatives studied by the developer and an indication of the main reasons for his choice, taking into account the environmental effects.

3. A description of the aspects of the environment likely to be significantly affected by the proposed project, including, in particular, population, fauna, flora, soil, water, air, climatic factors, material assets, including the architectural and archaeological heritage, landscape and the inter-relationship between the above factors.

4. A description (this description should cover the direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects of the project) of the likely significant effects of the proposed project on the environment resulting from:

- the existence of the project,
- the use of natural resources,
- the emission of pollutants, the creation of nuisances and the elimination of waste; and the description by the developer of the forecasting methods used to assess the effects on the environment.

5. A description of the measures envisaged to prevent, reduce and where possible offset any significant adverse effects on the environment.

6. A non-technical summary of the information provided under the above headings.

7. An indication of any difficulties (technical deficiencies or lack of know-how) encountered by the developer in compiling the required information.

STATUTORY INSTRUMENTS

1988 No. 1207

FORESTRY

The Environmental Assessment (Afforestation) Regulations 1988

Made - - - -	*12th July 1988*
Coming into force in accordance with regulation 1(1)	*15th July 1988*

Whereas both Houses of Parliament have approved by resolution a draft of these Regulations;

The Minister of Agriculture, Fisheries and Food, the Secretary of State for Scotland and the Secretary of State for Wales, acting jointly, being Ministers designated(a) for the purposes of section 2(2) of the European Communities Act 1972(b) in relation to measures relating to the requirement for an assessment of the impact on the environment of projects likely to have significant effects on the environment, in exercise of the powers conferred upon them by the said section 2(2) and of all other powers enabling them in that behalf, hereby make the following Regulations:

Title, application and commencement

1.—(1) These Regulations, which apply throughout Great Britain, may be cited as the Environmental Assessment (Afforestation) Regulations 1988 and shall come into force on the third day after the day on which they are made.

(2) These Regulations apply in any case where an application for a grant or loan in respect of an afforestation project was received by the Commissioners on or after 15th July 1988.

Interpretation

2. In these Regulations—

"afforestation project" means a proposal for the initial planting of land with trees for forestry purposes;

"the Commissioners" means the Forestry Commissioners constituted under the Forestry Acts 1919 to 1945 and continued in existence by the Forestry Act 1967(c);

"environmental information" means the environmental statement prepared by the applicant for a grant or loan in respect of an afforestation project, any representations made by any authority or body required by these Regulations to be consulted, and any representations duly made by any other body or person about the likely environmental effects of the afforestation project;

(a) S.I. 1988/785.
(b) 1972 c.68.
(c) 1967 c.10.

"environmental statement" means such a statement as is described in the Schedule;

"grant or loan" means a grant or loan under section 1 of the Forestry Act 1979(a);

"the Minister" means, in relation to England, the Minister of Agriculture, Fisheries and Food, in relation to Scotland, the Secretary of State for Scotland, and in relation to Wales, the Secretary of State for Wales.

Prohibition of grant or loan without consideration of environmental information

3. The Commissioners shall make no grant or loan for an afforestation project where in their opinion the project will be likely to have significant effects on the environment, and may lead to adverse ecological changes, by reason inter alia of its nature, size or location, unless they have first taken into consideration environmental information in respect of that project.

Opinion of Commissioners in advance of application for grant or loan

4.—(1) A person may, before applying for a grant or loan in respect of an afforestation project, make a written application to the Commissioners for their opinion in writing on whether environmental information would be required in relation to that project.

(2) An application pursuant to paragraph (1) above shall be accompanied by—

(a) a map or plan sufficient to identify the land on which the proposed planting would be carried out, and to show the extent of the proposed planting;

(b) a brief description of the nature of the proposed planting and of its possible effects on the environment; and

(c) such further information or representations as the applicant may wish to provide.

(3) Where the Commissioners consider that they have not been provided with sufficient information to enable them to give an opinion they shall notify the applicant of the points on which they require further information.

(4) The Commissioners shall give the applicant written notification of the opinion they have formed on the question raised within 4 weeks beginning with the date of the request, or such longer period as they may agree with him in writing, and where their opinion is that consideration of environmental information would be required, they shall state their reasons for it.

(5) Where the Commissioners have not given their written opinion by the end of the period provided for by paragraph (4) above, it shall be presumed that in their opinion environmental information would not be required.

(6) Where the Commissioners express the opinion that environmental information would be required, the applicant may apply in writing to the Minister for a direction on the matter, following the procedure provided in regulation 6.

Procedure where an environmental statement is required

5.—(1) Where it appears to the Commissioners that an afforestation project in respect of which an application is made for a grant or loan is a project in respect of which environmental information is required, but no environmental statement has been submitted with the application, they shall within 4 weeks beginning with the date of receipt of the application, or such longer period as they may agree with the applicant in writing, notify the applicant in writing of the opinion they have formed, stating their reasons for it, and that no grant or loan can be considered for the project without consideration of environmental information.

(2) The applicant may within 4 weeks beginning with the date of the notification referred to in paragraph (1) above inform the Commissioners in writing–

(a) that he accepts their view and proposes to provide an environmental statement; or

(b) that he proposes to apply in writing to the Minister for his direction on the matter as provided by regulation 6.

(a) 1979 c.21.

(3) If the applicant takes no action in accordance with paragraph (2) above within the period specified the grant or loan applied for shall be deemed to be refused at the end of that period.

(4) The Commissioners shall not determine any application for which environmental information is required otherwise than by refusing the grant or loan applied for unless–

(a) they receive an environmental statement and regulation 8(1) is complied with; or

(b) the Minister directs that consideration of environmental information is not required.

(5) Where the Commissioners receive an environmental statement relating to an application they shall, if regulation 8(1) has been complied with, proceed to deal with the application.

Applications for Ministers' directions

6.—(1) Every application to the Minister for a direction under regulation 4(6) shall be accompanied by, or by copies of–

(a) the application to the Commissioners for their opinion;

(b) the documents which accompanied that application, or were called for by the Commissioners under regulation 4(3);

(c) the opinion of the Commissioners, with their reasons for it; and

(d) any representations which the applicant wishes to make.

(2) Every application to the Minister for a direction under regulation 5(2)(b) shall be accompanied by, or by copies of–

(a) the application for a grant or loan;

(b) any documents which accompanied that application;

(c) the opinion of the Commissioners, with their reasons for it; and

(d) any representations which the applicant wishes to make.

(3) Where the Minister considers that the documents put before him in pursuance of paragraph (1) or (2) above do not provide him with sufficient information to enable him to give a direction he shall notify the applicant in writing of the points on which he requires further information, and may make a written request to the Commissioners for such information as they may be able to provide on the points raised.

(4) The Minister shall, within 4 weeks beginning with the date of receipt of the application, or such longer period as he may reasonably require, direct whether or not consideration of environmental information is required before a grant or loan may be made for the project.

(5) The Minister shall forthwith upon giving his direction send copies thereof to the applicant and the Commissioners, and where he directs that consideration of environmental information is required he shall state his reasons for making that direction.

Minister's power to give directions of his own motion

7. The Minister may of his own motion give a direction that consideration of environmental information is required in any case in which the Commissioners have decided to the contrary.

Publicity for environmental statement

8.—(1) Where environmental information is required under these Regulations by the Commissioners or by direction of the Minister the applicant shall–

(a) by advertisement in at least two local newspapers nominated by the Commissioners give notice of the afforestation project, notifying members of the public that any person wishing to make representations regarding the project should make them in writing to the Commissioners at the address specified in the advertisement within a specified period being not less than 28 days from the date of the advertisement;

(b) make available for inspection by members of the public at all reasonable times at an office of the Commissioners or at some other convenient place nominated by them (such times and place to be stated in the advertisement referred to in subparagraph (a) above), for a period of at least 21 days following the publication of the advertisement, the details of the project and of the environmental statement relating to it, and shall ensure that a reasonable number of copies of the statement are made available;

(c) state in the advertisement referred to in subparagraph (a) above the address at which copies of the environmental statement may be obtained and, if a charge is to be made for a copy, the amount of the charge.

(2) Where the Commissioners receive an environmental statement relating to an application to which regulation 3 applies they shall consult–

(a) the Nature Conservancy Council;

(b) the Countryside Commission or the Countryside Commission for Scotland, as appropriate; and

(c) any local authority, any other public authority and any statutory body which appears to them to have an interest in the afforestation project in question.

(3) Where under this regulation the Commissioners consult any authority or body about any environmental statement they shall give not less than 4 weeks' notice to such authority or body that such statement is to be taken into consideration, shall not consider the statement until after the expiration of the period of such notice, and shall, in considering the statement, take into account any representations received from such authority or body.

(4) The Commissioners shall consider the application and the environmental statement and any representations and comments made thereon by any person, body or authority, and shall communicate their decision as to whether or not to make a grant or loan for the project in writing to such person, body or authority and by means of public advertisements in the newspapers which they nominated for the purposes of the advertisements referred to in paragraph (1) above.

(5) Where an applicant for a grant or loan submits an environmental statement to the Commissioners he shall provide them with a sufficient number of copies of the statement or parts thereof to enable them to comply with paragraph (2) above plus one extra copy.

Provision of information

9. Where a person has applied, or to the Commissioners' knowledge proposes to apply, for a grant or loan in circumstances in which environmental information is required under these Regulations, the Commissioners shall–

(a) inform the authorities and bodies listed in regulation 8(2) of the application, and request them to make available to the applicant any information in their possession which he or they may consider relevant to the preparation of his environmental statement; and

(b) inform the applicant of what they have done under paragraph (a) above and that he shall supply such authorities and bodies with such further information about the afforestation project as they may reasonably request.

Further information and evidence relating to environmental statements

10.—(1) The Commissioners, when considering an application in relation to which an environmental statement has been provided, may in writing require the applicant to provide such further information as may be specified concerning any matter which is required to be, or may be, dealt with in the statement, and where in the opinion of the Commissioners–

(a) the applicant could (having regard in particular to current knowledge and methods of assessment) provide further information about any matter mentioned in paragraph 3 of the Schedule, and

(b) further information is reasonably required for the proper consideration of the likely environmental effects of the proposed project,

they shall notify the applicant in writing to that effect, and the applicant shall provide that further information.

(2) The Commissioners may in writing require an applicant to produce such evidence as they may reasonably call for to verify any information in his environmental statement.

Charges

11.—(1) A reasonable charge reflecting the costs of printing, copying and distribution may be made to the public for copies of an environmental statement made available to them under regulation 8 and for copies in excess of one copy for each authority or body consulted under that regulation.

(2) An authority or body providing information under regulation 9, having been requested to do so, may make a reasonable charge reflecting the costs of making available information which they had in their possession.

In Witness whereof the Official Seal of the Minister of Agriculture, Fisheries and Food is hereunto affixed on 12th July 1988.

L.S.

John MacGregor
Minister of Agriculture, Fisheries and Food

12th July 1988

Sanderson of Bowden
Minister of State, Scottish Office

12th July 1988

Ian Grist
Parliamentary Under-Secretary of State, Welsh Office

SCHEDULE

Regulation 2

1. An environmental statement comprises a document or documents providing, for the purpose of assessing the likely impact of the proposed afforestation project upon the environment, the information specified in paragraph 2 below (referred to in this Schedule as "the specified information").

2. The specified information is–

(a) a description of the afforestation project proposed, comprising information about the site of the project and the design and the extent of the planting proposed;

(b) the data necessary to identify and assess the main effects which the project is likely to have on the environment;

(c) a description of the likely significant effects of the project, direct and indirect, on the environment, explained by reference to its possible impact on–

human beings;
flora;
fauna;
soil;
water;
air;
climate;
the landscape;
the interaction between any of the foregoing;
material assets (including the architectural and archaeological heritage);
the cultural heritage;

(d) where significant adverse effects are identified with respect to any of the foregoing, description of the measures envisaged in order to avoid, reduce or remedy those effects; and

(e) a summary in non-technical language of the information specified above.

3. An environmental statement may include, by way of explanation or amplification of any specified information, further information on any of the following matters:

(a) the physical characteristics of the project, and the land-use requirements during the planting and subsequent stages;

(b) the main characteristics of the production processes proposed, including the nature and quality of the materials to be used;

(c) the estimated type and quantity of expected residues and emissions (including pollutants of water, air or soil, noise, vibration, light, heat and radiation) resulting from the project when planting is completed;

(d) (in outline) the main alternatives (if any) studied by the applicant and an indication of the main reasons for his choice, taking into account the environmental effects;

(e) the likely significant direct and indirect effects on the environment of the project which may result from–

(i) the use of natural resources;

(ii) the emission of pollutants, the creation of nuisances and the elimination of waste;

(f) the forecasting methods used to assess any effects on the environment about which information is given under subparagraph (e); and

(g) any difficulties, such as technical deficiencies or lack of knowledge, encountered in compiling any specified information.

In subparagraph (e) "effects" includes secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects.

4. Where further information is included in an environmental statement pursuant to paragraph 3 a non-technical summary of that information shall be provided.

EXPLANATORY NOTE

(This note is not part of the Regulations)

These Regulations, which apply throughout Great Britain, implement in relation to initial afforestation the Council Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment, (O.J. No. L175, 5.7.85, p. 40).

The Regulations prohibit the Forestry Commissioners from making any grant or loan for an initial afforestation project where in their opinion the project will be likely to have significant effects on the environment, and may lead to adverse ecological changes, by reason of such factors as its nature, size or location, unless they have first taken into consideration information as to the project's environmental impact. Provision is made for the Commissioners to require an applicant for a grant or loan to provide an environmental statement in such circumstances and to seek representations from the public and from certain authorities before any decision is made on the application.

There are provisions for an applicant for a grant or loan to apply to the responsible Minister, in contentious cases, for a direction as to whether or not such information is required, and each such Minister has the power to direct of his own motion that such information is required in cases where the Forestry Commissioners have ruled otherwise.

Regulations 4 to 10 lay down the procedures required to be followed in the making and consideration of applications for grants or loans in these circumstances, and the Schedule to the Regulations specifies the contents of the environmental statement required from the applicant for grant or loan.

Environmental Impact Assessment (Forestry) Scotland Regulations 1999

Appendix 1.3

SCOTTISH STATUTORY INSTRUMENTS

1999 No. 43
FORESTRY

The Environmental Impact Assessment (Forestry) (Scotland) Regulations 1999

Made	*3rd September 1999*
Laid before the Scottish Parliament	*3rd September 1999*
Coming into force	*6th September 1999*

ARRANGEMENT OF REGULATIONS

SCHEDULES

The Scottish Ministers, in exercise of the powers conferred on them by section 2(2) of the European Communities Act 1972 and of all other powers enabling them in that behalf, and having taken into account the selection criteria in Annex III to Council Directive 85/337/EEC as amended by Council Directive 97/11/EC hereby make the following Regulations:

Citation, commencement and extent

1. - (1) These Regulations may be cited as the Environmental Impact Assessment (Forestry) (Scotland) Regulations 1999 and shall come into force on 6th September 1999.

(2) These Regulations apply to Scotland.

Interpretation

2. - (1) In these Regulations-

"afforestation" means initial afforestation (which has the same meaning as in paragraph 1(d) of Annex II to the Directive);

"the Commissioners" means the Forestry Commissioners;
"countryside body" means Scottish Natural Heritage (established under section 1 of the Natural Heritage (Scotland) Act 1991 and the Scottish Environment Protection Agency (established under section 20 of the Environment Act 1995;
"deforestation" means deforestation for the purposes of conversion to another type of land use (which terms have the same meaning as in paragraph 1(d) of Annex II to the Directive);
"development" means development within the meaning of section 26 of the Town and Country Planning (Scotland) Act 1997
"the Directive" means Council Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment as amended by Council Directive 97/11/EC;
"EEA State" means a State which is a Contracting Party to the Agreement on the European Economic Area signed at Oporto on 2nd May 1992 as adjusted by the Protocol signed in Brussels on 17th March 1993;
"environmental information" means information in the environmental statement and any other information provided in accordance with these Regulations in relation to an application for consent or an appeal under regulation 17 or 21 relating to the likely environmental affects of the project which is the subject of the application or, as the case may be, appeal;
"environmental statement" means a statement-
(a) that includes such of the information referred to in Part I of Schedule I as is reasonably required to assess the environmental effects of the project and which the applicant can, having regard in particular to current knowledge and methods of assessment, reasonably be required to compile, but
(b) that includes at least the information referred to in Part II of Schedule 1;
"forest quarry works" means operations on land used or to be used for the purposes of forestry, or on land held or occupied with that land, to obtain the materials required for forest road works;
"forest road works" means the formation, alteration or maintenance of private ways on land used or to be used for the purposes of forestry;
"local authority" means a council constituted under section 2 of the Local Government etc. (Scotland) Act 1994
"project" means the execution of construction works or of other installations or schemes or other intervention in the natural surroundings or landscape including those involving the extraction of mineral resources;
"proposer" means person who proposes to carry out a project;
"relevant project" shall be construed in accordance with regulation 3 below.

(2) In these regulations, any reference to an enforcement notice shall be construed as including, as the context requires, a reference to a notice of variation under regulation 20(6)(a) or to an enforcement notice as so varied.
(3) Any reference in these Regulations (other than regulation 22) to consent is a reference to the consent of the Commissioners required by regulation 4, and-
(a) (where the context permits) includes consent by the appropriate Authority on an appeal under regulation 17; and
(b) in regulations 4 and 20 to 23 includes (in accordance with regulation 25(9)) consent granted under the Environmental Assessment (Forestry) Regulations 1998
(4) Unless the context otherwise requires, any reference in these Regulations to a numbered regulation or Schedule shall be construed as a reference to the regulation or Schedule bearing that number in these Regulations.

Interpretation of "relevant project"

3. - (1) For the purposes of these Regulations, a project is a relevant project if-
(a) it is a project of a type specified in paragraph (2) of this regulation;
(b) subject to paragraph (3) of this regulation, it is likely, by virtue of factors such as its nature, size or location, to have significant effects on the environment; and
(c) the carrying out of the project-
(i) does not involve development; or
(ii) involves development which is not mentioned in Schedule 1 to, or in column 1 of the table in Schedule 2 to, the Environmental Impact Assessment (Scotland) Regulations 1999 or
(iii) involves development for which planning permission is granted by Part 7 of Schedule 1 to the Town and Country Planning (General Permitted Development) (Scotland) Order 1992.
(2) The types of project referred to in paragraph (1)(a) above are-
(a) afforestation;
(b) deforestation;
(c) forest road works;
(d) forest quarry works.
(3) For the purposes of paragraph (1)(b) above, and subject to regulations 6(3) and 7(6), a project shall be taken not to be likely to have significant effects on the environment if the area covered, or to be covered, by the project does not exceed any relevant threshold set out in Schedule 2.

Restriction on relevant projects

4. - (1) Subject to paragraph (2) below, no person shall carry out, on any land, work or operations relating to a relevant project unless-
(a) consent has been granted for that project by the Commissioners or by the Scottish Ministers; and
(b) the project is carried out in accordance with the consent (including the conditions to which the consent is subject).
(2) In accordance with Article 2(3) of the Directive, the Commissioners may direct that a particular project is

exempted from the application of these Regulations.
(3) A direction under paragraph (2) shall be in writing and shall be accompanied by a statement of the Commissioners' reasons for making it.
(4) No direction shall be made under paragraph (2) above where it appears to the Commissioners that the project would be likely to have significant effects on the environment in another EEA State.

Application for an opinion whether a project is a relevant project
5. - (1) The proposer may apply in writing to the Commissioners for their opinion whether a project is a relevant project.
(2) An application under paragraph (1) above shall include or be accompanied by-
(a) a map or plan sufficient to identify the land that is the subject of the proposed project and the extent of the proposed project;
(b) a brief description of the nature of the proposed project and of its possible effects on the environment; and
(c) such further information or representations as the proposer may wish to provide or make.
(3) The Commissioners shall, if they consider that they have not been provided with sufficient information to enable them to give an opinion under paragraph (1) above, notify the proposer in writing of the matters on which they require further information and the proposer shall supply that further information to the Commissioners within such period as the Commissioners may reasonably require.

Opinions of the Commissioners
6. - (1) Where the proposer applies to the Commissioners under regulation 5, they shall give to the proposer written notice of their opinion within-
(a) 28 days beginning with the date of their receipt of the application or, where they notify the proposer under regulation 5(3) that they require further information, the date of their receipt of that information; or
(b) such longer period as may be agreed in writing between the Commissioners and the proposer.
2) Subject to paragraph (3), in considering, for the purpose of forming their opinion, whether the project is likely to have significant effects on the environment the Commissioners shall take into account the selection criteria in Schedule 3.
(3) In a case where the project does not exceed any relevant threshold set out in Schedule 2, the Commissioners shall form their opinion in accordance with regulation 3(3) except where, in their opinion, there are exceptional circumstances which, taking account of the selection criteria in Schedule 3, make it likely that the project will have significant effects on the environment.
(4) Where the opinion of the Commissioners is that the project is a relevant project, the Commissioners shall include in, or provide with, their opinion a written statement of their reasons for being of that opinion.
(5) The Commissioners may, in the absence of an application, give their opinion whether or not a project is or would be a relevant project and where they give an opinion under this paragraph-
(a) they shall give written notice of their opinion to any person who reasonably appears to them to be the proposer; and
(b) paragraphs (2), (3), (4) and (6) of this regulation shall apply as they do to an opinion given in relation to an application under regulation 5(1).
(6) In paragraph (3), the reference to circumstances which are, in the opinion of the Commissioners, exceptional shall be construed in accordance with paragraph 4 of Schedule 2.

Directions by the Scottish Ministers
7. - (1) The proposer may apply in writing to the Scottish Ministers for a direction whether a project is a relevant project where-
(a) the Commissioners give notice of their opinion under regulation 6(1) or regulation 6(5) that the project is or would be a relevant project; or
(b) the Commissioners fail to give notice of their opinion within the period of time required by regulation 6(1).
(2) An application under paragraph (1) above shall be accompanied by, or by copies of-
any application by the proposer to the Commissioners under regulation 5(1) and any documents supplied to the Commissioners by the proposer in connection with that application, and
(b) in a case falling within paragraph (1)(a) above, the opinion of the Commissioners and any written statement of reasons which they provided with it,
and may include such further information or representations as the proposer may wish to provide or make.
(3) Where the Scottish Ministers consider that the documents supplied under paragraph (2) above do not provide sufficient information to enable a direction to be given, the Scottish Ministers-
(a) shall notify the proposer in writing of the matters on which further information is required; and
(b) may seek further information on those matters from the Commissioners and the Commissioners shall supply that further information to the Scottish Ministers if it is in their possession.
(4) The Scottish Ministers shall give a direction within 28 days (or such longer period as they may reasonably require) beginning with-
(a) the date of receipt of the application under paragraph (1) above; or
(b) where the Scottish Ministers have required or sought further information under paragraph (3) above, the date of receipt by them of that information.
(5) Subject to paragraph (6), in considering, for the purpose of deciding on a direction, whether the project is likely to

have significant effects on the environment, the Scottish Ministers shall take into account the selection criteria in Schedule 3.
(6) In a case where the project does not exceed any relevant threshold set out in Schedule 2, the Scottish Ministers shall make its decision in accordance with regulation 3(3) except where, in its opinion, there are exceptional circumstances which, taking account of the selection criteria in Schedule 3, make it likely that the project will have significant effects on the environment.
(7) The Scottish Ministers shall provide the proposer and the Commissioners with a written statement of the direction including, where the direction is that the project is or would be a relevant project, the reasons for that direction.
(8) The Scottish Ministers may, in the absence of an application, give a direction whether or not a project is or would be a relevant project and where a direction is given under this paragraph-
(a) a written statement of the direction shall be provided to the Commissioners and to any person who reasonably appears to the Scottish Ministers to be the proposer; and
(b) paragraphs (5), (6), (7) and (9) of this regulation shall apply as they do to a direction given in relation to an application under paragraph (1).
(9) In paragraph (6), the reference to circumstances which are, in the opinion of the Scottish Ministers, exceptional shall be construed in accordance with paragraph 4 of Schedule 2.

Effect of directions and opinions
8. - (1) This paragraph applies to a direction given under regulation 7 that a project is not or would not be a relevant project or, in the absence of a direction under that regulation, to an opinion given under regulation 6 to that effect.
(2) A direction or opinion to which paragraph (1) above applies-
(a) shall have the effect of determining for the purpose of these Regulations that the project specified in the direction or opinion (but only that project) is not or would not be a relevant project; but
(b) shall cease to have effect (without prejudice to the availability of a further direction or opinion) on the expiry of-
(i) the period five years beginning with the date on which the direction or opinion is given, or
(ii) such shorter period as may be specified in the direction or opinion,
if the work relating to the project has not been completed within that period.

(3) This paragraph applies to a direction given under regulation 7 that a project is or would be a relevant project or, in the absence of a direction under that regulation, to an opinion given under regulation 6 to that effect.
(4) A direction or opinion to which paragraph (3) applies shall have the effect of determining for the purposes of these Regulations that the project specified in the direction or opinion is or would be a relevant project.

Request as to the information to be included in an environmental statement
9. - (1) Before applying for consent to carry out work in relation to a project, a proposer may request the Commissioners to give their opinion as to the information to be contained in the environmental statement required for that project.
(2) Where a proposer requests an opinion under paragraph (1) above before a determination has been made whether the project is or would be a relevant project, the Commissioners shall deal with the request as if the project is a relevant project.
(3) Before giving an opinion under paragraph (1) above, the Commissioners shall consult the proposer, the countryside bodies and any relevant local authority.
(4) The Commissioners shall, within a period of five weeks beginning with the date of the receipt of the request or such longer period as may be agreed in writing with the proposer, give their opinion under paragraph (1) above and shall send a copy to the proposer.
(5) Where the Commissioners fail to give their opinion under paragraph (1) above within the relevant period, the proposer may request the Scottish Ministers to make a direction as to the information to be contained in the environmental statement required for the project.
(6) Before making a direction under paragraph (5) above, the Scottish Ministers shall consult the proposer, the countryside bodies and any relevant local authority.
(7) The Scottish Ministers shall, within a period of five weeks beginning with the date of the receipt of the request or such longer period as may be required for the purpose, make a direction under paragraph (5) above and shall send a copy to the proposer and to the Commissioners.
(8) In paragraphs (3) and (6), "relevant local authority" means a local authority for the area in which it is proposed to carry out the project which appears to the Commissioners or, as the case may be, the Scottish Ministers to have an interest in the issue of what information the environmental statement should contain.

Applications for consent
10. - (1) An application for consent shall be made in writing to the Commissioners and shall be accompanied by-
(a) a map or plan sufficient to identify the land on which the relevant project would be carried out and the extent of any planting, regeneration, construction, works or operations;
(b) a description of the nature of the relevant project;
(c) an environmental statement in respect of the relevant project; and
(d) a copy of the notice to be published in accordance with regulation 13(1).
(2) An applicant for consent shall supply to the Commissioners such number of copies of the application and the documents accompanying it as the Commissioners reasonably may require.

Provision of further information

11. Where in the opinion of the Commissioners-

(a) further information is reasonably required for their proper consideration of the likely environmental effects of the relevant project to which an application for consent relates, and

(b) the applicant could (having regard in particular to current knowledge and methods of assessment) provide such information,

the Commissioners shall notify the applicant in writing of the matter on which they require further information and the applicant shall provide that further information.

Assistance in preparation of environmental statements

12. - (1) Subject to paragraphs (2) and (3) below, the Commissioners, each of the countryside bodies and the local authority for the area in which it is proposed to carry out the project shall, if requested by an applicant for consent, and may without such a request, enter into consultation with an applicant for consent to determine whether the Commissioners, the countryside body or the local authority have in their possession any information which may be relevant to the preparation of the environmental statement and if the Commissioners, the countryside body or local authority have such information, they shall make it available to the applicant.

(2) Paragraph (1) above shall not require disclosure of information which is capable of being treated as confidential, or must be so treated, under regulation 4 of the Environmental Information Regulations 1992.

(3) Paragraph (1) above shall not prevent the Commissioners or a countryside body imposing a charge reflecting the cost of making the information available (including the identification, preparation and copying of any information) or making the payment of such a charge a condition of providing the information.

Publicity

13. - (1) A person who makes an application for consent under regulation 10 or who provides further information under regulation 11 shall publish a notice in accordance with paragraph (2) below in at least two newspapers specified by the Commissioners for the purposes of ensuring-

(a) the application for consent or, as the case may be, the information provided under regulation 11, is made available to the public; and

(b) the public concerned is given an opportunity to express an opinion before the application for consent is determined.

(2) A notice required by paragraph (1) above shall-

(a) state that the application has been made or, as the case may be, that the further information has been furnished to the Commissioners;

(b) specify an office of the Commissioners or other place nominated by them at which copies of the application or the further information may be inspected free of charge at all reasonable hours within 28 days beginning with the date of publication of the notice;

(c) specify an address at which copies of the application or the further information may be obtained from the applicant and if a charge is to be made for a copy, the amount (not exceeding a reasonable charge for copying) of the charge; and

(d) state that any person wishing to make representations regarding the application or the further information should make them in writing to the Commissioners at an address nominated by them and specified in the notice, within 28 days beginning with the date of publication of the notice.

(3) On receipt of an application for consent under regulation 10, or of further information under regulation 11, the Commissioners shall provide copies of the application or, as the case may be, the further information, together with a notice stating that any representations regarding the application or the further information should be made in writing to the Commissioners within 28 days beginning with the date of the notice, to-

(a) the countryside bodies; and

(b) any local authority or other public authority which appears to the Commissioners to have an interest in the application.

(4) In this regulation, reference to an application includes a reference to the documents accompanying that application.

Information for another EEA State

14. - (1) Where it appears to the Commissioners that a project in relation to which they have received an application for consent would be likely to have significant effects on the environment of another EEA State, or where another EEA State likely to be significantly affected so requests, the Commissioners shall provide a copy of the environmental statement relating to the project to the Scottish Ministers.

(2) Where it appears to the Scottish Ministers that a project would be likely to have significant effects on the environment of another EEA State, or where another EEA State likely to be significantly affected so requests, they shall-

(a) send to the EEA State as soon as possible, and no later than the date of its publication as required by sub-paragraph (b) of this paragraph, the information mentioned in paragraph (3) of this regulation and, if the Scottish Ministers think fit, the information mentioned in paragraph (4) of this regulation;

(b) publish the information referred to in sub-paragraph (a) above in a notice placed in the Edinburgh Gazette with an indication of where further information is available;

(c) give the EEA State a reasonable time in which to indicate whether it wishes to participate in the procedure for which these Regulations provide; and
(d) inform the applicant for consent.
(3) The information referred to in paragraph (2)(a) of this regulation is-
(a) a description of the project, together with any available information on its possible significant effects on the environment in another EEA State; and
(b) information on the nature of the decision which may be taken.
(4) Where an EEA State indicates, in accordance with paragraph (2)(c), that it wishes to participate in the procedure for which these Regulations provide, the Scottish Ministers shall as soon as possible send to that EEA State the following information-
(a) a copy of the application for consent;
(b) a copy of the environmental statement; and
(c) relevant information regarding the procedure under these Regulations, but only to the extent that such information has not been provided to the EEA State earlier in accordance with paragraph (2) of this regulation.
(5) The Scottish Ministers shall also-
(a) arrange for the information referred to in paragraphs (3) and (4) of this regulation to be made available, within a reasonable time, to the authorities referred to in Article 6(1) of the Directive and the public concerned in the territory of the EEA State likely to be significantly affected; and
(b) ensure that those authorities and the public concerned are given an opportunity, before the determination of the application for consent, to forward to them, within a reasonable time, their opinion on the information supplied.
(6) The Scottish Ministers shall in accordance with Article 7(4) of the Directive-
(a) enter into consultations with the EEA State concerned regarding, inter alia, the potential significant effects of the project on the environment of that EEA State and the measures envisaged to reduce or eliminate such effects, and
(b) determine in agreement with the other EEA State a reasonable period of time for the duration of the consultation period.
(7) Where an EEA State has been consulted in accordance with paragraph (6), on the determination of the application concerned the Scottish Ministers shall inform the EEA State of the decision and shall forward to it a statement of-
(a) the content of the decision and any conditions attached thereto;
(b) the main reasons and considerations on which the decision is based; and
(c) a description, where necessary, of the main measures to avoid, reduce and, if possible, offset the major adverse effects of the project.

Determination of applications
15. - (1) Where an application is made to the Commissioners for consent, they may, subject to the provisions of this regulation-
(a) grant consent either subject only to the conditions required by regulation 18 or also subject to such further conditions as they see fit; or
(b) refuse consent.
(2) The Commissioners shall not determine an application until after the expiry of the periods referred to in regulation 13 during which representations may be sent to the Commissioners or where appropriate any period of consultation with an EEA State in accordance with regulation 14.
(3) In determining an application, the Commissioners shall take into consideration the environmental information, any representations received by them in relation to the application and any other material consideration, including in particular their assessment of the direct and indirect effects of the relevant project on the environmental factors specified in Schedule 4.

Notification of decisions
16. Where an application for consent has been determined by the Commissioners they shall-
(a) give notice in writing of their decision to the applicant and any person from whom they received representations in relation to the application, stating that they have taken into consideration the environmental information relating to the application and giving the reasons and considerations on which the decision was based; and
(b) publish a notice of their decision in the newspapers in which notice of the application was published in accordance with regulation 13(1) which gives details of the place and times at which the public may inspect a statement of-
(i) the content of the Commissioners' decision and any conditions attached thereto;
(ii) the main reasons and considerations on which the decision is based; and
(iii) a description, where necessary, of the main measures to avoid, reduce and, if possible, offset the major adverse effects of the project.

Appeals against decisions of the Commissioners
17. - (1) An applicant for consent may appeal to the Scottish Ministers where the Commissioners-
(a) have refused the application;
(b) have granted consent subject to conditions in addition to those required by regulation 18; or
(c) have granted consent subject only to the conditions required by regulation 18 but have specified a period for the purposes of one or both of those conditions less than the maximum period permitted by that regulation.
(2) An appeal under this regulation shall be made within 28 days, or such longer period as the Scottish Ministers may,

within that period of 28 days, allow, beginning with the date on which the applicant receives notification of the Commissioners' decision under regulation 16.
(3) An appeal shall be made by notice in writing to the Scottish Ministers accompanied by, or by copies of-
(a) the application to which it relates, and any documents provided by the applicant to the Commissioners in relation to it;
(b) the decision of the Commissioners; and
(c) any other information or representations which the appellant wishes to provide or make.
(4) On receipt of a notice of appeal duly made, the Scottish Ministers shall send a copy of it to the Commissioners who shall, within 28 days beginning with the date of receipt by them of the notice of appeal, supply to the Scottish Ministers copies of any representation or information provided to them in relation to the application.
(5) On an appeal under this regulation, the Scottish Ministers may allow or dismiss the appeal or vary any part of the Commissioners' decision; and, where its decision is that consent should be granted, may accordingly grant consent either subject only to the conditions required by regulation 18 or also subject to such further conditions as it may determine.
(6) The Scottish Ministers shall determine an appeal within 28 days (or such longer period as it reasonably may require) beginning with the date of receipt of the representations or information supplied in accordance with paragraph (4) above.
(7) In determining an appeal, the Scottish Ministers shall take into consideration the environmental information, any representations in relation to the appeal and any other material consideration, including in particular its assessment of the direct and indirect effects of the relevant project on the environmental factors specified in Schedule 4.
(8) Where an appeal has been determined, the Scottish Ministers shall-
(a) give notice of the decision stating that this takes into consideration the environmental information relating to the application and giving the reasons and considerations on which the decision was based to-
(i) the appellant;
(ii) the Commissioners; and
(iii) any person from whom the Commissioners received representations in relation to the application to which the appeal relates; and
(b) publish a notice of the decision in the newspapers in which the decision of the Commissioners to which the appeal relates was published in accordance with regulation 16(b) giving details of the place and times at which the public may inspect a statement of-
(i) the content of the Scottish Ministers' decision and any conditions attached thereto;
(ii) the main reasons and considerations on which the decision is based; and
(iii) a description, where necessary, of the main measures to avoid, reduce and, if possible, offset the major adverse effects of the project.

Conditions to be included in every consent
18. Every consent shall include conditions to the effect that-
(a) work in relation to the relevant project shall be commenced within such period (not being more than 5 years beginning with the date consent is granted) as is specified in the consent; and
(b) no work shall be carried out in relation to the relevant project after the expiration of such period (not being more than 10 years beginning with the date consent is granted) as is specified in the consent.

Application to the court by person aggrieved
19. - (1) On the application of any person aggrieved by the grant of consent, the court may make an order reducing the consent where it is satisfied that the consent was given contrary to whichever of regulation 15(3) or 17(7) applies in the case or that the interests of the applicant have been substantially prejudiced by a failure to comply with any other requirement of these Regulations.
(2) An application to the court under this regulation shall be made within 6 weeks from the date of publication of the decision in accordance with regulation 16(b) or 17(8)(b).
(3) The court may by interim order, pending the determination of an application under this regulation, suspend the operation of the consent on such terms as it may think fit.
(4) In this regulation "the court" means the Court of Session.

Enforcement notices
20. - (1) Where it appears to the Commissioners that a person is carrying out or has carried out work in relation to a relevant project-
(a) without consent, where consent is required by regulation 4, or
(b) in breach of a condition subject to which consent has been granted under these Regulations,
the Commissioners may serve an enforcement notice on that person.
(2) An enforcement notice may require the person on whom it is served to take such one or more of the following measures as appear to the Commissioners to be suitable in the circumstances, namely-
(a) apply to the Commissioners for consent;
(b) discontinue work in relation to the relevant project;
(c) restore the land to its condition before any work in relation to the relevant project was carried out;
(d) carry out on the land any works or operations, specified in the enforcement notice, which in the opinion of the Commissioners are reasonably necessary to secure compliance with any condition subject to which consent was

granted or to remove or alleviate any injury to the environment which has been caused by the relevant project.
(3) An enforcement notice shall specify the period during which any of the measures mentioned in paragraph (2)(a), (c) or (d) is to be taken and may specify different periods for different measures.
(4) Either-
(a) an enforcement notice served by virtue of paragraph (1)(a) above shall include or be accompanied by a written statement of the Commissioners' reasons for being of the opinion that the project is a relevant project; or
(b) the Commissioners shall serve such a written statement on the person on whom the enforcement notice was served as soon as practicable after serving the enforcement notice.
(5) Either-
(a) an enforcement notice shall include or be accompanied by a notice explaining how, to whom and within what period an appeal may be brought and whether the requirements of the enforcement notice will be stayed while an appeal is pending; or
(b) the Commissioners shall serve such a notice on the person on whom the enforcement notice was served as soon as practicable after serving the enforcement notice.
(6) The Commissioners may, at any time-
(a) by a further notice served on the person on whom the enforcement notice was served, vary an enforcement notice; and
(b) withdraw an enforcement notice.
(7) An enforcement notice may be served on any person-
(a) by delivering it to him personally;
(b) by leaving it for him at his last known place of abode or business; or
(c) by sending it through the post addressed to him at his last known place of abode or business.
(8) An enforcement notice may-
(a) in the case of a body corporate, be served on the secretary or clerk of that body at the address of the registered or principal office of that body;
(b) in the case of a partnership, be served on a partner or person having the control or management of the partnership business.

Appeals against enforcement notices
21. - (1) Any person on whom an enforcement notice has been served in accordance with regulation 20 may appeal to the Scottish Ministers.
(2) An appeal under this regulation shall be made within 28 days, or such longer period as the Scottish Ministers may, within that period of 28 days, allow, beginning with the date on which the appellant receives the enforcement notice.
(3) An appeal shall be made by notice in writing to the Scottish Ministers accompanied by, or by copies of-
(a) the enforcement notice;
(b) any relevant consent; and
(c) any other information or representations which the appellant wishes to provide or make.
(4) On receipt of a notice of appeal duly made, the Scottish Ministers shall send a copy of it to the Commissioners who shall, within 28 days beginning with the date of receipt by them of the notice of appeal, supply to the Scottish Ministers copies of any representation or information provided to them in relation to any relevant consent or application for consent.
(5) On an appeal under this regulation, the Scottish Ministers may, subject to paragraph (9) below, allow or dismiss the appeal or vary any part of the enforcement notice.
(6) The Scottish Ministers shall determine an appeal within 28 days (or such longer period as it reasonably may require) beginning with-
(a) the date of receipt of the representations or information supplied in accordance with paragraph (4) above; or
(b) where there is no consent or application for consent relevant to the enforcement notice, the date of receipt by the Scottish Ministers of the notice of appeal.
(7) In determining an appeal, the Scottish Ministers shall take into consideration any environmental information, any representations received by them in relation to the appeal and any other material consideration, including in particular its assessment of the direct and indirect effects of the relevant project on the environmental factors specified in Schedule 4.
(8) Where an appeal has been determined, the Scottish Ministers shall give notice of the decision, giving the reasons and considerations on which the decision was based, to the appellant and the Commissioners.
(9) The Scottish Ministers shall not allow an appeal against an enforcement notice served by virtue of regulation 20(1)(a) where it appears to them that consent is required by regulation 4.
(10) The making of an appeal under this regulation shall have the effect of suspending the operation of any requirement in the enforcement notice to which it relates to take measures described in paragraphs (a), (c) or (d) of regulation 20(2) until the appeal is determined by the Scottish Ministers or, where the appeal is withdrawn, until withdrawal of the appeal.

Penalties for non-compliance with enforcement notices
22. - (1) Any person who carries out work in relation to a relevant project in contravention of a requirement to discontinue that work in an enforcement notice served on him in accordance with regulation 20 shall be guilty of an offence and liable-
(a) on summary conviction to a fine not exceeding the statutory maximum; or

(b) on conviction on indictment to a fine.
(2) Any person on whom an enforcement notice has been served in accordance with regulation 20 who fails, within the period specified in the enforcement notice, to carry out any measure, other than discontinuance of the relevant project, required by the enforcement notice shall be guilty of an offence and liable on summary conviction to a fine not exceeding level 5 on the standard scale.
(3) Where an offence under paragraph (1) or (2) above which has been committed by a body corporate is proved to have been committed with the consent or connivance of, or to be attributable to any neglect on the part of-
(a) any director, manager, secretary or other similar officer of the body corporate, or
(b) any person who was purporting to act in any such capacity,
he as well as the body corporate shall be guilty of the offence and shall be liable to be proceeded against and punished accordingly.
(4) Where an offence under paragraphs (1) or (2) above has been committed by a Scottish partnership and the contravention in question is proved to have occurred with the consent or connivance of, or to be attributable to any neglect on the part of, a partner, he as well as the partnership shall be guilty of that offence and shall be liable to be proceeded against and punished accordingly.

Power of entry and default powers
23. - (1) Subject to paragraph (2) below, any person duly authorised in writing by the Commissioners may at any reasonable time enter any land on which he or the Commissioners reasonably suspects or suspect that work in relation to a relevant project is being or has been carried out-
(a) without consent, where such consent is required under regulation 4; or
(b) in breach of a condition subject to which consent has been granted.
(2) Where any measures required by an enforcement notice by virtue of regulation 20(2) (other than discontinuance of the relevant project) have not been taken within the period specified in the enforcement notice-
(a) any person duly authorised by the Commissioners may at any reasonable time enter the land to which the enforcement notice relates and take those measures; and
(b) the Commissioners may recover from the person on whom the enforcement notice was served any expenses reasonably incurred by them in doing so.
(3) A person authorised under paragraphs (1) or (2) above to enter any land shall, if so requested, produce evidence of his authority before so entering.

Registers of opinions, directions, determinations etc. for public inspection
24. - (1) At each of their Conservancy offices in Scotland, the Commissioners shall keep a register of the following, so far as relating to the area of that Conservancy-
(a) each direction received under regulation 4(2);
(b) each opinion under regulation 6(1) or (5);
(c) each direction received under regulation 7(7);
(d) each opinion under regulation 9(1);
(e) each direction received under regulation 9(7);
(f) each determination under regulation 15(1);
(g) each determination received under regulation 17(8);
(h) statements of reasons accompanying any of the above;
(i) each environmental statement received, including any further information.
(2) Each register kept under this regulation shall be available for inspection by the public at all reasonable hours.

Revocation and transitional provisions
25. - (1) Subject to the following provisions of this regulation, the Environmental Assessment (Forestry) Regulations 1998 (in this regulation called "the 1998 Regulations") are hereby revoked with respect to Scotland.
(2) Paragraph (1) of this regulation shall not affect the continued application of the 1998 Regulations in Scotland in respect of any matter relating to-
(a) a breach of regulation 3 of those Regulations which occurred before the date of coming into force of these Regulations; or
(b) an enforcement notice issued under regulation 16 of those Regulations; and these Regulations shall not apply to such a matter.
(3) Where, before the date of coming into force of these Regulations, an application under regulation 4(1) of the 1998 Regulations has been received by the Commissioners in relation to land in Scotland but the Commissioners have not given their opinion in relation to that application-
(a) the application shall be treated as an application under regulation 5(1) of these Regulations; and
(b) any notification of the Commissioners under regulation 4(3) of the 1998 Regulations shall be treated as a notification under regulation 5(3) of these Regulations (but without prejudice to their power to make a further notification under the latter regulation).
(4) Where, before the date of coming into force of these Regulations, an application under regulation 6(1) of the 1998 Regulations has been received by the Scottish Ministers in relation to land in Scotland but a direction has not been given in relation to that application-
(a) the application shall be treated as an application under regulation 7(1) of these Regulations; and
(b) any notification by the Scottish Ministers under regulation 6(3) of the 1998 Regulations shall be treated as a

notification under regulation 7(3) of these Regulations (but without prejudice to the power to make a further notification under the latter regulation).
(5) Where, before the date of coming into force of these Regulations, an application under regulation 7 of the 1998 Regulations has been received by the Commissioners in relation to land in Scotland but the Commissioners have not determined that application-
(a) the application shall be treated as an application under regulation 10 of these Regulations;
(b) any notification by the Commissioners under regulation 8 of the 1998 Regulations shall be treated as a notification under regulation 11 of these Regulations (but without prejudice to their power to make a further notification under the latter regulation).
(6) Where, before the date of coming into force of these Regulations, an appeal under regulation 13 of the 1998 Regulations has been received by the Scottish Ministers but that appeal has not been determined, the appeal shall be treated as an appeal under regulation 17 of these Regulations.
(7) Where-
(a) a case falls to be treated under these Regulations by virtue of paragraph (3), (4) or (6) above, and
(b) part or all of a period of time specified in regulation 6(1), 7(4) or (as appropriate) 17(4) or (6) of these Regulations ("the relevant provision") expired before the date of the coming into force of these Regulations,
the whole of the specified period shall be taken into account for the purposes of these Regulations in the same way as if the relevant provision had been in force on the date specified in the relevant provision as the date on which the period began to run.
(8) A direction of the Scottish Ministers under regulation 6 of the 1998 Regulations that a particular project was not a relevant project for the purpose of those Regulations, or in the absence of such a direction an opinion of the Commissioners under regulation 5 of those Regulations to that effect-
(a) shall be treated, after the coming into force of these Regulations, as determining that the project specified in the direction or opinion (but only that project) is not a relevant project for the purposes of these Regulations; but
(b) shall cease to have the effect stated in sub-paragraph (a) (without prejudice to the availability of a further direction or opinion under these Regulations) on the expiry of the period of five years beginning with the date of coming into force of these Regulations if the work relating to the project has not been completed within that period.
(9) Regulations 4 and 20 to 23 of these Regulations apply in relation to any consent given under the 1998 Regulations (including any conditions to which that consent is subject) as they apply to a consent (including such conditions) given under these Regulations.

ROSS FINNIE
A member of the Scottish Executive

St Andrew's House, Edinburgh
3rd September 1999

SCHEDULE 1

Regulation 2(1)

INFORMATION FOR INCLUSION IN ENVIRONMENTAL STATEMENTS

PART 1

1. Description of the project, including in particular-
(a) a description of the physical characteristics of the whole project and the land-use requirements during the construction and operational phases;
(b) a description of the main characteristics of the production processes, for instance, nature and quantity of the materials used;
(c) an estimate, by type and quantity, of expected residues and emissions (water, air and soil pollution, noise, vibration, light, heat, radiation, etc.) resulting from the operation of the proposed project.
2. An outline of the main alternatives studied by the applicant and an indication of the main reasons for his choice, taking into account the environmental effects.
3. A description of the aspects of the environment likely to be significantly affected by the proposed project, including in particular, population, fauna, flora, soil, water, air, climatic factors, material assets including the architectural and archaeological heritage, landscape and inter-relationship between the above factors.
4. A description of the likely significant effects of the proposed projects on the environment, which should cover the direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects of the project, resulting from-
(a) the existence of the project;
(b) the use of natural resources;
(c) the emission of pollutants, the creation of nuisances, and the elimination of waste, and the description by the applicant of the forecasting methods used to assess the effects on the environment.
5. A description of the measures envisaged to prevent, reduce and, where possible, offset any significant adverse

effects on the environment.
6. A non-technical summary of the information provided under paragraphs 1 to 5 above.
7. An indication of any difficulties (technical deficiencies or lack of know-how) encountered by the applicant in compiling the required information.

PART II

1. A description of the project comprising information on the site, design and size of the project.
2. A description of the measures envisaged in order to avoid, reduce and, if possible, remedy significant adverse effects.
3. The data required to identify and assess the main effects which the project is likely to have on the environment.
4. An outline of the main alternatives studied by the applicant and an indication of the main reasons for his choice, taking into account the environmental effects.
5. A non-technical summary of the information provided under paragraphs 1 to 4 above.

SCHEDULE 2

Regulation 3(3)

THRESHOLDS FOR IDENTIFICATION OF PROJECTS LIKELY TO HAVE SIGNIFICANT EFFECTS ON THE ENVIRONMENT

Interpretation

1. For the purposes of this Schedule-
"sensitive area" means-

(a) land notified under subsection (1) of section 28 (areas of special scientific interest) of the Wildlife and Countryside Act 1981;
(b) land to which subsection (3) of section 29 (nature conservancy orders) of the Wildlife and Countryside Act 1981 applies;
(c) a property appearing on the World Heritage List kept under article 11(2) of the 1972 UNESCO Convention for the Protection of the World Cultural and Natural Heritage;
(d) a scheduled monument within the meaning of the Ancient Monuments and Archaeological Areas Act 1979;
(e) an area designated as a Natural Heritage Area by a direction made by the Secretary of State or the Scottish Ministers under section 6(2) of the Natural Heritage (Scotland) Act 1991 or as a National Scenic Area by a direction made by the Secretary of State under section 262C of the Town and Country Planning (Scotland) Act 1972;
(f) a European site within the meaning of regulation 10 of the Conservation (Natural Habitats etc.) Regulations 1994;
"specified threshold" means any threshold specified in hectares in Column 2 or 3 of the Table in paragraph 2 below.

Thresholds

2. - (1) For the purposes of regulation 3(3), the threshold for any project of a type specified in an entry in column 1 in the Table below is the area (if any) specified in the corresponding entry in Column 2 or 3 of the Table, whichever is appropriate to the land covered, or proposed to be covered, by that project.
(2) This paragraph applies subject to paragraph 3 of this Schedule.

TABLE

Column 1	*Column 2*	*Column 3*
Type of Project	*Threshold where any part of the land is in a sensitive area*	*Threshold where no part of the land is in a sensitive area*
Afforestation	2 hectares, where the sensitive area is one referred to in paragraph 1(e) above. No threshold in the case of other sensitive areas.	5 hectares.
Deforestation	0.5 hectare, where the sensitive area is one referred to in paragraph 1(e) above No threshold in the case of other sensitive areas.	1 hectare.
Forest road works	No threshold.	1 hectare.
Forest quarry works	No threshold.	1 hectare.

Thresholds for extending projects

3. - (1) Where the project under consideration is an extending project-
(a) the thresholds specified in the Table in paragraph 2 above shall not apply; and
(b) the threshold applicable for that project for the purposes of regulation 3(3) shall be instead such balance (if any), in hectares, of the area specified in Column 2 or, as the case may be, Column 3 in that Table opposite the entry in Column 1 for that type of project as remains after deduction of the accumulated material past project area).

(2) For the purposes of sub-paragraph (1)(b) above, it is immaterial whether any part of the accumulated material past project area is, or is not, in a sensitive area (or any kind of sensitive area).
(3) In this paragraph-
"extending project" means any project covering, or proposed to cover, land adjoining the area of one or more material past projects;
"material past project", in relation to a particular extending project, means a project which-
(a) is of the same type (as specified in regulation 3(2)) as that extending project; and
(b) was completed after the coming into force of these Regulations; and
(c) was completed not more than five years before the proposed date for starting the work relating to that extending project;
"Accumulated material past project area", in relation to a particular extending project, means the total area covered by-
(a) the material past project or, if more than one, all of them; and
(b) every other project-
(i) whose area adjoins the material past project, or one of them; and
(ii) which satisfies conditions (a) to (c) in the definition of "material past project".

Consideration of thresholds in other cases where project adjoins or is near another project
4. - (1) The facts-
(a) that a project is or would be adjoining or, in the opinion of the Commissioners or (as the case may be) the Scottish Ministers, near another project of any type specified in regulation 3(2), and
(b) that, for any reason, the case in question does not fall within paragraph 3 above,
may be regarded by the Commissioners or the Scottish Ministers as rendering the circumstances of that project exceptional for the purposes of regulation 6(3) or (as the case may be) 7(6).
(2) This paragraph-
(a) shall not affect the application of those regulations in a case which does fall within paragraph 3; and
(b) shall not be interpreted as limiting the generality of the references in those regulations to circumstances which are, in the opinion of the Commissioners or (as the case may be) the Scottish Ministers, exceptional.

SCHEDULE 3

Regulations 6(2) and 7(5)

PROJECTS HAVING SIGNIFICANT EFFECTS ON THE ENVIRONMENT: SELECTION CRITERIA

1. Characteristics of projects
The characteristics of projects must be considered having regard, in particular, to:
- the size of the project;
- the cumulation with other projects;
- the use of natural resources;
- the production of waste;
- pollution and nuisances;
- the risk of accidents, having regard in particular to substances or technologies used.

2. Location of projects
The environmental sensitivity of geographical areas likely to be affected by projects must be considered, having regard, in particular, to:
- the existing land use;
- the relative abundance, quality and regenerative capacity of natural resources in the area;
- the absorption capacity of the natural environment, paying particular attention to the following areas:
(a) wetlands;
(b) coastal zones;
(c) mountain and forest areas;
(d) nature reserves and parks;
(e) areas classified or protected in the United Kingdom or under the law of other member states; special protection areas designated pursuant to Directive 79/409/EEC on the conservation of wild birds and 92/43/EEC on the conservation of natural habitats and wild fauna;
(f) areas in which the environmental quality standards laid down in Community legislation have already been exceeded;
(g) densely populated areas;
(h) landscapes of historical, cultural or archaeological significance.

3. Characteristics of the potential impact
The potential significant effects of projects must be considered in relation to criteria set out under headings 1 and 2 above, and having regard in particular to:
- the extent of the impact (geographical area and size of the affected population);
- the transfrontier nature of the impact;

- the magnitude and complexity of the impact;
- the probability of the impact;
- the duration, frequency and reversibility of the impact.

SCHEDULE 4

Regulations 15(3), 17(7) and 21(7)

ENVIRONMENTAL FACTORS

(a) Human beings, fauna and flora;
(b) soil, water, air, climate and the landscape;
(c) material assets and the cultural heritage; and
(d) the interaction between the factors mentioned in paragraphs (a) to (c) above.

EXPLANATORY NOTE

(This note is not part of the Regulations)

The Environmental Assessment (Forestry) Regulations 1998, (S.I.1998/1731) ("the 1998 Regulations") provided for the implementation in relation to forestry projects in Great Britain of Council Directive 85/337/EEC on the assessment of the effects of certain public and private and public projects on the environment. The present Regulations implement, for Scotland, changes made to that Directive made by Council Directive 97/11/EC. They also implement the extension of both Directives to the Contracting Parties of the European Economic Area (EEA) under Article 74 and Annex XX paragraph I.1 of the Agreement on the European Economic Area, as given effect by Decision No.20/1999 of the EEA Joint Committee adopted on 26th February 1999 (not yet published).

These Regulations restate the provisions in the 1998 Regulations with revisions and amendments, and the 1998 Regulations are therefore revoked with respect to Scotland.

Regulation 2 defines terms used in the Regulations. As in the 1998 Regulations, there is a prohibition on carrying out any work or operations in relation to a project which is a "relevant project" (as defined) unless consent has been obtained from the Forestry Commissioners or, on appeal, the Scottish Ministers. A further new provision gives the Forestry Commissioners power, in accordance with Directive 85/337/EEC, as amended, to exempt particular projects from the application of the Regulations (regulation 4).

"Relevant project" is defined in regulation 3 as one of four types of project relating to forestry which does not constitute development regulated by the legislation on town and country planning but which is likely to have substantial effects on the environment. In a new provision, a project which covers an area falling below certain thresholds specified in Schedule 2 to the Regulations is to be treated as not likely to have substantial effects on the environment. However, the Commissioners or the Scottish Ministers have power to treat such a project as a relevant project requiring consent *where, in their opinion, exceptional circumstances make it likely that the project will have* substantial effects on the environment.

A person who proposes to carry out a project may apply to the Commissioners for an opinion as to whether the project is a relevant project. If dissatisfied with that opinion, or if no opinion is given, he may apply to the Scottish Ministers for a direction on the issue. In determining that issue account must be taken of the environmental criteria set out in Schedule 3. A new provision enables the Commissioners or the Scottish Ministers to issue an opinion or direction without receiving an application. An opinion or direction that the project is not a relevant project will lapse if the project is not completed within five years (regulations 5 to 8).

The proposer of a project may also seek an opinion from the Commissioners as to the information that should be included in the environmental statement attached to an application for consent (see below), and if they fail to give an opinion may seek a direction from the Scottish Ministers (regulation 9).

Applications to the Commissioners for consent for a relevant project must be accompanied by an environmental statement which must contain the information required by Schedule 1 to the Regulations. The Commissioners may request further information and other bodies holding relevant information are required to make it available. There are requirements to publish the application and any further information and to invite representations. Where it appears that the project may be likely to have significant effects on the environment in another State of the European Economic Area, provision is made for the authorities of that State to be consulted before a decision is made. In making their decision, the Commissioners are required to have regard to the environmental statement and the direct and indirect effects on environmental factors specified in Schedule 4. Their decision must be notified in writing (regulations 10 to 16).

Where consent is refused the person proposing the project may appeal to the Scottish Ministers (regulation 17). There is a requirement that any consent granted by the Commissioners or the Scottish Ministers be subject to specified conditions (regulation 18). Where consent is granted an aggrieved person has a right of complaint to the Court of Session if they believe that the grant of consent was contrary to the Regulations (regulation 19).

The Commissioners are given powers to serve enforcement notices where relevant projects are carried out without consent or in breach of conditions. The person served with such a notice may appeal to the Scottish Ministers. Penalties are specified for breach of an enforcement notice. A power of entry and certain default powers are conferred on officers authorised by the Commissioners (regulations 20 to 23).

At each of their Conservancy offices in Scotland, the Forestry Commissioners are required to keep a register of opinions, directions and determinations for public inspection (regulation 24).

Transitional provisions apply, including treatment of a number of ongoing applications, appeals etc. under the 1998

Regulations as if they had been made under these Regulations (regulation 25).
A Regulatory Impact Appraisal has been prepared in relation to these Regulations. It has been placed in the Scottish Parliament information centre and copies may be obtained from Country Services Division, Forestry Commission, 231 Corstorphine Road, Edinburgh EH12 7AT (Telephone: 0131 314 6324).

APPENDIX 2

2.1 List of All Environmental Impact Assessments Called 1988 – 1998

2.2 Forest Sector Review Checklist

2.3 Forest Sector Review Record Sheet

2.4 Results of Forest Sector Review

2.5 Maintaining Review Quality

List of All Environmental Impact Assessments Called 1988-1998 Appendix 2.1

Property name	Area	Conservancy	Owner	Grounds for requiring ES	Code	Date ES requested	Outcome Code
Turbiskill Farm	307	Strathclyde	private	Knapdale NSA SSSI	B,C	11/02/88	WBA
Glenure Forest Estate	28.1	SW Scot	private	Impact on SSSI	B	06/09/88	WBA
Corrielair	400	Highland	private	Significant scale, In the public eye	D	07/09/88	APP
Auchenroy and Dalcairnie	489.8	Strathclyde	private	Significant scale and in the public view	D	15/09/88	APP
Pitcarmick	164	Perth	private	Breadalbane ESA	C	24/10/88	APP
Baillie Whirr	40.8	SW Scot	private	SSSI	B	28/11/88	WBA
Cnoc Nan Gall	246.6	Highland	private	Sensitive location	A	02/12/88	APP
The Hope	466.1	Highland	private	Sensitivity of site	A	02/12/88	APP
South Channain 2	39.2	Highland	private	Sensitive location	A	02/12/88	APP
Brabster Farm 2	564	Highland	private	Sensitive area	A	23/12/88	APP
North Winless	85.1	Highland	private	partly within 2 SSSIs	A	06/01/89	WBA
Gulls Nest	302.7	Grampian	private	Significant extent within SSSI	B	10/01/89	WBA
Coull Farm	84	Strathclyde	private	Within SSSI	B	20/01/89	WBA
Gorteneorn	296	Strathclyde	private	NSA over 100 ha.	C	06/02/89	WBA
Mulea Plantation	94	Strathclyde	private	Within Loch Lomond ESA and NSA	C	15/02/89	WBA
Bhealaich	301.6	Highland	private	Significant extent in sensitive location	A	13/04/89	APP
Stonehouse Farm	19.4	Strathclyde	private	SSSI	B	07/07/89	WBA
East Halladale	1065	Highland	private	Significant scale in sensitive location	A	05/09/89	WBA
West Halladale	833.2	Highland	private	Significant scale in sensitive location	A	05/09/89	WBA
Auchtertyre	464	Highland	private	Significant scale in sensitive location. Includes small SSSI.	B	25/09/89	APP
Gallohoille Farm	200	Strathclyde	private	Within Knapdale scenic area - over 100 ha.	D	09/11/89	APP
Forest Farms	2545	Highland	private	Scale and location	A	10/11/89	APP
Lochluichart (2)	216	Highland	private	SSSI	B	27/11/89	WBA
Ardtornish	69	Highland	private	Proposed SSSI	D	28/11/89	APP
Cragganester	188	Perth	private	Breadalbane ESA. >100 ha.	C	27/02/90	WBA
Munsary	1272	Highland	private	Scale & location	A	02/05/90	REJ
Clachbreck	338.5	Strathclyde	private	Within Knapdale scenic area - over 100 ha.	C,D	04/09/90	APP
Glen Derby	305	Perth	private	Breadalbane ESA. >100 ha.	C	14/09/90	APP
Loch Oisinneach Atholl Estate	500	Perth	private	ESA	C	09/11/90	APP
Clunes, Atholl Estates	518	Perth	private	Sensitive scenic area	D	09/11/90	WBA
Knoydart Peninsula, Inverie Glen	698	Highland	private	Scale and location	D	01/12/90	APP
The Crannach	107	Grampian	private	Scale and ornithological interest	D	10/12/90	WBFC
Glenskible	585.2	Strathclyde	private	Size and archaeological interest	C	13/12/90	WBA

Property name	Area	Conservancy	Owner	Grounds for requiring ES	Code	Date ES requested	Outcome Code
Black Clauchrie	734.7	Strathclyde	private	Scale and location. General Conservation interest.	D	18/12/90	APP
Invermearan	102.5	Perth	private	Over 100 ha.	C	18/12/90	WBA
Arran Estate Trust NSG1	81.1	Strathclyde	private	Size and location	B,C	20/12/90	WBA
Arran Estate Trust NSG3	85.7	Strathclyde	private	Size and location	C	20/12/90	WBA
Mid Tangy	70	Strathclyde	private	SSSI	B	10/01/91	WBA
Ben Loyal	81	Highland	private	Scale and location	A	18/03/91	WBA
Bolfracks	103.9	Perth	private	Breadalbane ESA	C	04/04/91	APP
Little Cloak	122.9	SW Scot	private	ESA, over 100 ha, last open space	C	08/05/91	APP
Braeroy	107	Highland	private	SSSI scale and location	B	10/05/91	APP
Auchmannoch Farm	535	Strathclyde	private	Size and location	D	03/06/91	APP
Letham	748	L & B	private	Size and location; water quality	D	05/09/91	AWA
Ruantallain	70	Strathclyde	private	SRC, Indicative strategy sensitivity	D	11/09/91	APP
Ballygrogan Farm	340	Strathclyde	private	Over 100 ha.	D	11/09/91	WBA
Glenrie and Drumbuie	601.4	SW Scot	private	Size	B,C	23/09/91	AWA
Blackmount	400	Strathclyde	private	NSA, 500ha+	C	25/09/91	APP
Tirfergus Hill	94	Strathclyde	private	Significant landscape	D	03/10/91	WBA
Barguillean	1200	Strathclyde	private	100 ha +	D	22/10/91	APP
Sumardale	258	Highland	private	Scale and location	D	04/11/91	WBA
Nicolswalls	150	Perth	private	Water catchment, scale, sensitivity	D	02/12/91	APP
Inverchoalin	607	Strathclyde	private	Scale, 500ha+, NP.	D	13/12/91	APP
Strathconon	1125	Highland	private	Scale, SSSI	B	16/12/91	APP
Castle Hill, Ben Loyal	149.7	Highland	private	NSA and Scale	A,C	18/12/91	APP
Bishophill	92.2	Perth	private	ESA	C	18/12/91	APP
Meall An t'Suidne	213	Highland	private	NSA. Significant scale & change of land use.	B,C	19/02/92	APP
Glentruim	414.8	Highland	private	Landscape, Ornithology	D	03/03/92	APP
Temple Farm	128	W & A	private	Landscape archaeology	D	06/03/92	WBA
Ballindalloch	34	Grampian	private	Scale, planting in SSSI	B	24/03/92	APP
Glen Rossal	191.2	Highland	private	Scale	A	13/04/92	APP
Invercassley	225.3	Highland	private	Scale	A	13/04/92	APP
Glenbarr	260	Strathclyde	private	Over 100 ha.	D	02/06/92	APP
South Cobbinshaw Farm	229	L & B	private	SSSI		30/07/92	WBA
Philips Mains	669.7	Highland	private	Scale	A	03/08/92	APP
Kinchurdy	305.3	Highland	private	Proposed ESA, scale.	D	20/08/92	APP
Kinveachy Forest - NPS	584.6	Highland	private	Scale, SSSI	B,D	20/08/92	APP
Beinn Chreagach	120	Strathclyde	private	Over 100 ha.	D	16/09/92	APP
Glenfeshie Estate	653.3	Highland	private	Scale, SSSI, NSA	B,C,D	25/09/92	WAD
Beinn Leamhain	560	Highland	private	Scale	D	30/10/92	APP
Glen Scaddle	644	Highland	private	Scale	D	03/11/92	WBFC
Southdean	97	L & B	private	Landscape, impact.		11/11/92	APP

Property name	Area	Conservancy	Owner	Grounds for requiring ES	Code	Date ES requested	Outcome Code
College Valley	80	N & D	private	Part in North Nat. Park, part SSSI	B	12/11/92	APP
Lochlyoch	760	Strathclyde	private	Over 100 ha.	D	19/11/92	APP
Great Hagley Farm	82.5	W Midlands	private	Size, ESA, AONB	C	31/01/93	WBA
Claonaig	1760	Strathclyde	private	Over 100 ha.	D	02/02/93	APP
Glen Mhor 1	707	Highland	private	Extent, NSA, GLV	C,D	04/02/93	APP
Auchleeks	198	Perth	private	Water catchment area, scale, sensitivity.	C	04/02/93	APP
Glen Mhor 2	125	Highland	private	Extent, GLV	D	04/02/93	WBA
Church Farm	86	K & ES	private	Scale, area of special significance for agriculture	D	11/02/93	APP
Dalnessie	157	Highland	FE	Scale	A,D	15/02/93	APP
Invercarron	131	Highland	FE	Scale	A,D	15/02/93	APP
Mar Lodge	326	Grampian	private	Scale, NSA, SSSI.	B,D	17/02/93	APP
Drumliath	625	Highland	private	Size	D	24/02/93	APP
Balgy Estate	248	Highland	private	NSA, SSSI, Size	C,B,D	15/03/93	WBFC
Braulen	843	Highland	private	SSSI, Size	B,D	15/03/93	WBFC
Deuchary Hill	425	Perth	private	Water catchment, scale, sensitivity	C	19/04/93	APP
Logie Regaule	412	Grampian	private	Scale, vegetation types.	D	28/04/93	APP
Burnfoot 1	56	L & B	private	Ministers Direction		24/05/93	APP
Burnfoot 2	140	L & B	private	Ministers Direction		24/05/93	APP
Stockwell Farm	160	W & A	private	AONB,Archaeology, Landscape	D	21/06/93	APP
Solwaybank Bell's Flow	67.8	SW Scot	private	Deep peat bog, semi natural vegetation, proposed SSSI	D	28/06/93	WBA
Atholl Estates, Clunes	651	Perth	private	ESA	C	09/07/93	APP
Glen Bruar	520	Perth	private	ESA	C	02/09/93	APP
Glen Banvie	166.6	Perth	private	ESA	C	02/09/93	APP
Eribol Loch Hope	749	Highland	private	scale	A,D	24/09/93	APP
Altyre-Rochuin	702	Grampian	private	Scale, vegetation types	D	24/09/93	APP
Dunearn Nat Pinewood	662.2	Highland	private	Scale	D	28/09/93	AWA
Wandell Hill	143	Strathclyde	private	Size, landscape, ESA	C	04/11/93	APP
Cochno Hill	527	Strathclyde	private	Size, landscape, RSA, +500ha.	D	17/11/93	AWA
Glencassley Langwell Wood	149.8	Highland	private	Scale	A	24/11/93	APP
Arisaig	908	Highland	private	SSSI, NSA, Size	B,C,D	15/12/93	APP
Glenshiel Cluanie E Glenq	984	Highland	private	Scale, NSA	A,C	20/12/93	APP
Finnart and Invercomrie	457	Perth	private	SSSI, ESA, NSA, Size,AGLV	B,C	22/12/93	APP
West Willows	370	Highland	private	Scale	D	20/01/94	APP
Phones Estate	602	Highland	private	Scale, ESA, SSSI	B,C	07/03/94	APP
Meikle Hill	255	Grampian	private	Scale	D	12/04/94	APP
Foundland Hill	353	Grampian	private	Scale	D	12/04/94	APP
Kinloch-Teacus	175	Highland	private	Scale & sensitivity, SSSI abutts swt site	B,D	28/04/94	APP
Biallard	293	Highland	private	Scale, sensitivity & effect on grasslands.	B,C,D	12/05/94	WBA

Property name	Area	Conservancy	Owner	Grounds for requiring ES	Code	Date ES requested	Outcome Code
Arscaig	208	Highland	private	Scale	A,D	13/05/94	APP
Dunrobin Glen II	356.5	Highland	private	Scale and landscape	A,D	13/05/94	APP
Dunrobin Glen I	296.8	Highland	private	Scale and landscape	A,D	13/05/94	APP
Dorback	280	Highland	private	Scale & sensitivity.	B,C,D	24/05/94	APP
Cluny Sch 2	137	Highland	private	Sensitivity & landscape.	B,C,D	21/06/94	WBFC
Attadale Native Pinewood	268.6	Highland	private	Significant extent	D	23/06/94	WBA
Philips Mains 2	207.1	Highland	private	Scale & sensitivity.	A,D	28/06/94	WBA
Wester Abercalder	520	Highland	private	Scale	D	08/07/94	WBA
Overinnes & Glen Cladh Hill	734	Strathclyde	private	+500 ha	A	11/07/94	WAD
Auchindare	665.1	Grampian	private	Scale etc	D	13/07/94	APP
Strone	300	Strathclyde	private	Landscape, flora	D	14/07/94	APP
Ardtaraig	600	Strathclyde	private	Landscape, raptors, flora, 500ha+.	D	14/07/94	APP
Tullich Estate 2	410	Highland	private	Significant extent, part of NSA	C,D	14/07/94	WBA
Garbh Shlios	1091	Highland	private	Scale, part of SSSI (botanical)	B,D	22/07/94	WAD
Creagan Breac Braeroy	141.4	Highland	private	Scale, part of SSSI	B,D	27/07/94	APP
North Barn Farm	200	West Country	Private	Scale, location, AONB, SAM, OAM, Archaeological interest, edge of Dorset Downs.	D	30/07/94	WAD
Glenuig	530	Highland	private	Scale, NSA, SSSI	B,C,D	09/08/94	APP
Pinclanty Hill	90.5	Strathclyde	private	ESA, 100ha+		13/10/94	APP
Altnaharra	334.5	Highland	private	Scale, sensitivity	A,D	14/10/94	APP
Arinanaun	500	Strathclyde	private	+500 ha.	D	24/10/94	AWA
Stronachulin	100	Strathclyde	private	+100 ha	A	14/12/94	APP
Ardchattan	1750	Strathclyde	private	+500 ha, NP.	A	15/02/95	APP
Loch Arnicle		Strathclyde	private	+100 ha	A	21/03/95	APP
Doup Farm	262	Perth	private	SSSI, LWS, AGLU.		19/04/95	AWA
Meggernie	331.7	Perth	private	SSSI,ESA,NSA,size/landscape	C,B	20/04/95	AWA
Lochs Estate	430.6	Perth	private	SSSI,ESA,NSA,size/landscape	C,B	20/04/95	AWA
Allt an T Siohean	393.5	Highland	private	scale and sensitivity	C,D	26/04/95	AWA
Waterhead of Dryfe	1019	SW Scot	private	effect on environment due to size.	B	28/04/95	AWA
Rhidorroch Estate	217	Highland	private	Scale and sensitivity	D	17/05/95	APP
Plochaig	230.2	Highland	private	scale and sensitivity	D	25/05/95	WBFC
Ardverikie Estate Ardruighie/W	127	Highland	private	Scale and sensitivity	D	05/06/95	APP
Aldverikie Estate Allt Dubh	140	Highland	private	Scale and sensitivity	D	05/06/95	WBA
Ardverikie Estate Ardruighie/E	133	Highland	private	Scale and sensitivity	D	05/06/95	WBA
Aldverikie Estate Meall Damh	295	Highland	private	Scale and sensitivity	D	05/06/95	WBFC
Black Corries Estate Glencoe	183.3	Highland	private	Scale and sensitivity	C,D	15/06/95	WAD

Property name	Area	Conservancy	Owner	Grounds for requiring ES	Code	Date ES requested	Outcome Code
Dale Farm	236.2	Highland	private	Scale and change of land use	A,D	23/06/95	WBA
Cornharrow	357.6	SW Scot	private	ESA and over 100 ha.	C	11/07/95	APP
Dalchork Hill	392.8	Highland	private	Scale and sensitivity	A,D	28/07/95	WBA
Gairloch & Canon Est Loch Bad an Sgalaig	914.4	Highland	private	Scale and sensitivity	C,D	21/09/95	APP
Benaketil	85	Highland	private	Scale, landscape & nature cons. sensitivity.	D	25/09/95	WAD
Feorlig Township	100	Highland	private	Scale, landscape & nature cons. sensitivity.	D	25/09/95	WAD
Vatten Township	61	Highland	private	Landscape and sensitivity	D	25/09/95	WAD
Vatten 4	2.2	Highland	private	Landscape and sensitivity	D	25/09/95	WAD
Coire an T-seilich	307.5	Highland	private	Scale and landscape sensitivity	D	26/09/95	AWA
Druim Bubh	181.3	Highland	private	Scale and sensitivity	D	26/09/95	AWA
Lochan Leathan	255	Highland	private	Scale and sensitivity	D	26/09/95	WAD
Urrard Estate	98.8	Perth	private	SSSI,ESA	B,C	09/10/95	RWA
Kinlochleven	1778	Highland	private	Scale and sensitivity, landscape cons,recreation,water.	D	12/10/95	WAD
Dundonnell Estate	782	Highland	private	Scale and sensitivity	D	31/10/95	WAD
Traboyack Farm	287.3	Strathclyde	private	over 100ha	D	19/11/95	APP
Wester Guisachan	504	Highland	private	Scale/sensitivity/landscape/conservation/recreation	B,C,D	22/11/95	APP
Ben Lomond	20	Perth	private	SSSI, ESA, NSA, Reg Park.	B,C	08/01/96	ARD
Carnoch	1763	Highland	private	Impact on landscape & loss of open ground	D	29/03/96	APP
Talladh A Bheithe	161	Perth	private	ESA/NSA Critical load		11/04/96	WBA
Torr An Eas	283.1	Highland	private	Scale and sensitivity. (Proximity to public water supply catchment area,conservation)	D	16/05/96	WAD
Lochluichart Estate Glenmarksie	169	Highland	private	Impact on landscape and conservation value. Scale and effect on red deer.	D	23/05/96	APP
Strath Tirry	392.8	Highland	private	Scale and sensitivity	A,D	23/05/96	APP
Burnside and Raemoir	395	Grampian	private	scale etc	D	29/05/96	AWA
Toxside	280	L & B	private	Feeding area for pink footed geese		26/06/96	AWA
Cawdor - Auchterteang	722.4	Highland	private	Significant area of new planting within the Cairngorms BSA area	C,D	08/07/96	AWA
Struie Hill	98.2	Highland	private	Extension of large scale approved N pine wood. In the vicinity of extensive commercial woodlands and SSSI (Birchwoods, landscape impact, sitting prominently within the Dornoch Firth NSA).	C,D	16/07/96	WBFC

Property name	Area	Conservancy	Owner	Grounds for requiring ES	Code	Date ES requested	Outcome Code
Caplich Wood 1	207.2	Highland	private	Large scale planting in one of the few non-afforested areas in Strathoykel.	A,D	23/07/96	WAD
Caplich Wood 2	405.3	Highland	private	Large scale planting in one of the few non-afforested areas in Strathoykel.	A,D	23/07/96	WAD
7 Achachork	34.2	Highland	private	Landscape sensitivity	D	22/08/96	WBFC
10 Achachork	76.5	Highland	private	Landscape sensitivity	D	22/08/96	WBFC
Glenavon	45.1	Grampian	private	Remote location of high scenic value in close proximity to nationally designated sites.	D	22/08/96	WFC
Talladh A Bheithe	72.1	Perth	private	NSA, ESA		28/08/96	APP
Balmoral Glen Gelder	236	Grampian	private	Scale, potentially sensitive area	D	14/10/96	WAD
Dunecht - Finlets Pinewood	312.7	Grampian	private	Scale, potentially sensitive area	D	14/10/96	WFC
Lamahip	265.5	Grampian	private	Scale, potentially sensitive area	D	14/10/96	WFC
North Hill Pinewood	260	Grampian	private	Scale, potentially sensitive area	D	14/10/96	WFC
Mar Lodge Estate	8478	Grampian	private	Scale, impact on semi natural heathland deer and birds.	D	23/10/96	WFC
Eskdale Moor	373.5	Highland	private	Sensitive population of moorland birds, potential significant ecology and landscape.	D	24/10/96	AWA
Auctenny	120	Perth	private	Size/balance/land use		06/11/96	APP
Burnmouth Community Council Woodland	6.3	L & B	private	Planting in SSSI	D	08/11/96	WBA
Lochportain	81	Highland	private	Scale, sensitivity due to NSA	D,C	11/11/96	AAD
Creebank	224	SW Scot	private	Over 100 ha	C	20/11/96	WBA
Queensferry	382.5	SW Scot	private	Over 100 ha in ESA	C	26/11/96	APP
Loch Katrine	463.7	Perth	private	NSA water quality		11/12/96	WFC
West Monar & Pait	251	Highland	private	Impact on ecology of area and landscape, potential loss of wilderness	B,D	17/02/97	WAD
Coire Nam Brathan	93	Highland	private	Impact on ecology of area, close proximity of core SPC area sensitive aspects of deer fencing.	B,C,D	19/02/97	WBA
Glen Mhor	128.5	Highland	private	Impact on SSSI, bird populations and change of habitat	B,D	24/03/97	WAD
Couldoran Tournapress	179	Highland	private	Landscape and habitat sensitivity and scale.	C, D	26/03/97	WAD

Property name	Area	Conservancy	Owner (FE or private)	Grounds for requiring ES	Code	Date ES requested	Outcome Code
Torloisk 1	1527	Strathclyde	private	over 100 ha	D	08/04/97	WAD
Torloisk 2	950	Strathclyde	private	over 100 ha	D	08/04/97	WAD
Strathvaich Estate West Glascarcnoch	341.1	Highland	private	Location, geological interest and habitat sensitivity	B	21/04/97	ARD
Glenfinglas	595	Perth	private	NSA balance land use		22/04/97	WAD
Blar A' Chaoruinn	223.4	Highland	private	Impact on landscape/high elevation planting/proposed establishment methods/integration with surrounding forest design.	C,D	23/04/97	WBA
Lodge Estate	1283	Strathclyde	private	Over 100 ha	D	24/04/97	WBA
Dunans	180	SW Scot	private	Over 100 ha, Eagles	D	27/05/97	AWA
Creag Dhubh	116.5	Highland	private	scale	B,C,D	01/07/97	APP
Coille Dhubh	171	Highland	private	Scale, habitat, Potential to impact on Coille Dhubh SSSI, mussels in River Kerry, Wester Ross NSA.	B,C,D	11/07/97	WBFC
Strathconon	2655	Highland	private	Landscape impact. Flora, fauna and riparian interest. Impact on SSSI.	B,D	21/07/97	ARD
Dale Farm	225.1	SW Scot	private	Scale and change of land use	A,D	26/09/97	WBA
Barbeck	750	Strathclyde	private	over 100 ha	D	30/09/97	WBA
Glen Kinglas	97.5	Strathclyde	private	Approx 100 ha	D	14/10/97	APP
Clerkhill	300	SW Scot	private	over 100 ha	D	31/10/97	AWA
Candacraig Ladylea	530	Grampian	private	Scale, loss of heather moorland.	D	13/11/97	RWA
Drumbeg	30.3	L & B	private	SSSI	B	25/11/97	WBA
Invercauld Tullich and Creagan Riabhach	258	Grampian	private	Scale, impact on birds, loss of heather moorland.	A	28/11/97	RWA
Invercauld Craig Leck	116	Grampian	private	Scale, SSSI, loss of heather moorland	D	28/01/98	RWA

APP	Approved contract
ARD	Applicant rejected screening decision
AWA	ES Accepted with applicant
REJ	Rejected
RWA	EIA requested with applicant
WAD	Waiting for decision on screening decision
WBA	Withdrawn by applicant
WBFC	Requirement for EIA withdrawn by FC
WFC	With FC

Forest Sector Review Checklist **Appendix 2.2**

1. DESCRIPTION OF THE PROJECT & LOCAL ENVIRONMENT

1.1 Development Description

Are the project **aims** and **objectives** clearly described?
Is the full **extent** of the planting proposal indicated?
Are the various **phases** of the afforestation scheme described?
Is the forest **design** and **methods of work** clearly described?
Have all **inputs** been described and quantities estimated?
Has adequate consideration been given to new or upgraded **access routes**?
Have any **residues or emissions** been identified, and if so quantified?
Have any **associated works** been described?

1.2 Site Description

Is the **location** of the proposal clearly described using a scaled map?
Has the **present landuse** of the proposed area been described?
Have **neighbouring landuses** been described?
If present, have any **special designations** been indicated?

2. BASELINE CONDITIONS

2.1 Environment

If appropriate, have **full quantified descriptions** been provided for the following showing the with/without project trends and the abundance, value or importance of the variable in local, regional, national or international terms:
Geology/soils;
Flora;
Fauna;
Water;
Climate;
Air;
Landscape;
Topography;

2.2 Socio-economic

Material assets;
Human beings;
Habitation;
Recreation;
Access;
Visual;
Cultural heritage;
Employment.

3. IDENTIFICATION & EVALUATION OF KEY IMPACTS

3.1 Scoping

Have the reasons the FC called for the ES been identified?
Has there been are any **process of scoping**, and if so have significant impacts been identified in a methodical, comprehensive way with reasons for inclusion/exclusion of possible impacts?
Has there been any process of **identification of parties** that may be affected by the proposal?
Has the **local authority** been approached for its views on the likely significant impacts associated with the project, and it's comments fully noted?
Have the **statutory consultees** been approached for their views on the likely significant impacts associated with the project, and their comments fully noted?
Has **expert advice** been sought, and if so are these instances noted?

Has the opinion of **local groups** been sought and noted?
Has the **general public** been allowed to comment on the proposal, and if so have these comments been noted?
Have any **action groups** been contacted for their views on the likely significant impacts associated with the project, and their comments fully noted?
Has the **method(s) of impact prediction** been indicated?
Have the **reasons for including/excluding** specific impacts been clearly described?
Has any reference been made to **recognised standards** or **methods of best practice**?

3.2 Prediction of Impact Magnitude (for each variable purported to be subject to significant impact)

Has the **variable** affected been clearly identified?
Has the predicted **deviation** from the baseline been clearly described?
Is the **impact magnitude** clearly stated?
Is there any indication of the **duration** of the impact?
Is any reference made to the **reversibility** of the impact?
Has reference been made to the **probability** that the impact will occur?
Are limits of **confidence** clearly stated?
Has the possibility of **cumulative effects** been addressed?
Has the relationship with **(inter)national standards**/levels been described?
Has the **basis for the prediction** been clearly described?
Have any **assumptions** made and their consequences been clearly described?

3.3 Impact Significance Assessment

Have the **methods** used to reach the assessment been identified and described?

4. ALTERNATIVES

Have any alternative **methods of working** been described and evaluated?
Have any alternative **uses of the site** been described and evaluated?
Have any alternative **sites** been proposed and evaluated?
Has the '**zero-option**' been evaluated?
Have the alternatives been described and evaluated in **equal depth**, and the reasons for selecting the project clearly stated?

5. MITIGATION

Have any methods of mitigation proposed to **avoid** impacts been fully described?
Have any methods of mitigation proposed to **reduce** impacts been fully described?
Have any proposed **compensatory measures** been fully described?
Have any **remedial works** been fully described?
Have any **residual impacts** following mitigatory actions been described, and if so are these fully quantified?

6. MONITORING

Has there been full consideration of those impacts thought worthy of monitoring, and if so have the **targets** of the monitoring operations been clearly identified and required data described?
Has the **responsibility** of the monitoring operations been placed with a competent body?
Has the **frequency** and **duration** of the monitoring operations been set?
Have adequate **guidelines** been drawn up which can be followed in the event of monitoring identifying deviation from the proposed impact levels?
Has adequate provision been made for **auditing** the EA process?

7. COMMUNICATION OF RESULTS

7.1 Presentation

Has the author(s) of the ES been **identified** and a **contact** address given?

Is the ES **comprehensive**, does it identify the significant areas and cover these in a concise, clear manner?

Have **summaries** been prepared at the end of long or complicated sections to focus attention on the pertinent points of interest?

Has a **glossary** of technical terms been included to aid comprehension by non-professionals?

Have good quality **maps and diagrams** been used to aid comprehension?

7.2 Balance

Has the assessment been presented in an **unbiased** fashion without favour for the project, giving adequate coverage to all significant impacts?

Has the ES presented the information in an even manner without undue **emphasis** on non-significant impacts?

7.3 Non-technical summary

Is a non-technical summary present, and if so does it represent a **true précis** of the whole ES?

Does the non-technical summary adequately identify the **significant impacts**and describe their effect on target variables?

Is the non-technical summary free from jargon or complex statistics and **easy to understand**?

8. DIFFICULTIES IN ES PRODUCTION

Have any difficulties been encountered **collecting** or collating data?

Have any difficulties been encountered **analysing** data or predicting levels of impact?

Forest Sector Review Record Sheet — Appendix 2.3

ES PROJECT NAME:	ES No:										
	STATUS		PRESENCE				GRADING				COMMENTS
1 DESCRIPTION OF THE PROJECT & LOCAL ENVIRONMENT											
1.1 Development description											
Project objectives			Y	N	N/A		A	B	C	D	
Extent	M		Y	N	N/A		A	B	C	D	
Phases of the project	D		Y	N	N/A		A	B	C	D	
Design/work methods	M		Y	N	N/A		A	B	C	D	
Inputs	D		Y	N	N/A		A	B	C	D	
Access			Y	N	N/A		A	B	C	D	
Residues & emissions	D		Y	N	N/A		A	B	C	D	
Associated works			Y	N	N/A		A	B	C	D	
1.2 Site description											
Location	M		Y	N	N/A		A	B	C	D	
Present land use			Y	N	N/A		A	B	C	D	
Neighbouring land uses			Y	N	N/A		A	B	C	D	
Special designations			Y	N	N/A		A	B	C	D	
2 BASELINE CONDITIONS											
2.1 Environment											
Geology	M		Y	N	N/A		A	B	C	D	
Soils	M		Y	N	N/A		A	B	C	D	
Flora	M		Y	N	N/A		A	B	C	D	
Fauna	M		Y	N	N/A		A	B	C	D	
Water	M		Y	N	N/A		A	B	C	D	
Climate	M		Y	N	N/A		A	B	C	D	
Air	M		Y	N	N/A		A	B	C	D	
Landscape	M		Y	N	N/A		A	B	C	D	
Topography			Y	N	N/A		A	B	C	D	
2.2 Socio-economic											
Material assets	M		Y	N	N/A		A	B	C	D	
Human beings	M		Y	N	N/A		A	B	C	D	
Habitation			Y	N	N/A		A	B	C	D	
Recreation			Y	N	N/A		A	B	C	D	
Access			Y	N	N/A		A	B	C	D	
Visual			Y	N	N/A		A	B	C	D	
Cultural heritage	M		Y	N	N/A		A	B	C	D	
Employment			Y	N	N/A		A	B	C	D	
2.3 Methods of assessment			Y	N	N/A		A	B	C	D	
3 ID & EVALUATION OF KEY IMPACTS											
3.1 Scoping											
Identification of affected parties			Y	N	N/A		A	B	C	D	
Local authority(s)			Y	N	N/A		A	B	C	D	
Statutory consultees			Y	N	N/A		A	B	C	D	
Expert advice			Y	N	N/A		A	B	C	D	
Local groups			Y	N	N/A		A	B	C	D	
General public			Y	N	N/A		A	B	C	D	
Action groups			Y	N	N/A		A	B	C	D	
Method of impact identification			Y	N	N/A		A	B	C	D	

Reasons for in/excluding			Y	N	N/A		A	B	C	D	
Conformation with best practices			Y	N	N/A		A	B	C	D	
3.2 Prediction of impact magnitude											
Variable affected clearly stated			Y	N	N/A		A	B	C	D	
Deviation from baseline			Y	N	N/A		A	B	C	D	
Magnitude			Y	N	N/A		A	B	C	D	
Duration			Y	N	N/A		A	B	C	D	
Reversibility			Y	N	N/A		A	B	C	D	
Probability			Y	N	N/A		A	B	C	D	
Confidence in prediction			Y	N	N/A		A	B	C	D	
Cumulative impacts			Y	N	N/A		A	B	C	D	
Relation to (inter)national standards			Y	N	N/A		A	B	C	D	
Basis for prediction			Y	N	N/A		A	B	C	D	
Assumptions			Y	N	N/A		A	B	C	D	
3.3 Impact significance assessment											
Approach to evaluation	D		Y	N	N/A		A	B	C	D	
4 ALTERNATIVES											
Alternative work methods	D		Y	N	N/A		A	B	C	D	
Alternative uses of site			Y	N	N/A		A	B	C	D	
Alternative sites			Y	N	N/A		A	B	C	D	
Zero option			Y	N	N/A		A	B	C	D	
Reasons for selecting proposal	D		Y	N	N/A		A	B	C	D	
5 MITIGATION											
Avoidance of impacts	M		Y	N	N/A		A	B	C	D	
Reduction of impacts	M		Y	N	N/A		A	B	C	D	
Compensatory actions			Y	N	N/A		A	B	C	D	
Remedial actions	M		Y	N	N/A		A	B	C	D	
6 MONITORING											
Consideration of impacts to monitor			Y	N	N/A		A	B	C	D	
Monitoring responsibility			Y	N	N/A		A	B	C	D	
Frequency			Y	N	N/A		A	B	C	D	
Action to be followed in event of problems			Y	N	N/A		A	B	C	D	
Provision for audit			Y	N	N/A		A	B	C	D	
7 COMMUNICATION OF RESULTS											
7.1 Presentation											
Identification & contact addresses			Y	N	N/A		A	B	C	D	
Comprehensiveness			Y	N	N/A		A	B	C	D	
Glossary			Y	N	N/A		A	B	C	D	
Summaries			Y	N	N/A		A	B	C	D	
Maps			Y	N	N/A		A	B	C	D	
7.2 Balance											
Bias			Y	N	N/A		A	B	C	D	
Undue emphasis			Y	N	N/A		A	B	C	D	
7.3 Non-technical summary											
Present	M		Y	N	N/A		A	B	C	D	
Comprehensive			Y	N	N/A		A	B	C	D	
Non-technical	M		Y	N	N/A		A	B	C	D	
8 DIFFICULTIES IN ES PRODUCTION											
Technical	D		Y	N	N/A		A	B	C	D	
Organisational			Y	N	N/A		A	B	C	D	
Knowledge based	D		Y	N	N/A		A	B	C	D	
M = MANDATORY, D = DISCRETIONARY											

ES Number	Property Name	Conservancy	Author type	Author	DESCRIPTION OF THE PROJECT		IDENTIFICATION &EVALUATION OF KEY IMPACTS				ALTERNATIVES & MITIGATION			COMMUNICATION				OVERALL GRADE
					Development description	Site description	Scoping	Baseline Conditions	Prediction of impact magnitude	Impact significance assessment	Alternatives	Mitigation	Monitoring	Presentation	Balance	Non-technical summary	Difficulties	
1	Corrielair	Highland	Forestry	Fountain	B	D	D	D	D	D	D	D	D	C	B	B	D	C
2	Glenrossal	Highland	Forestry	B Taylor/ Bell Ingram	C	B	D	D	D	D	C	D	D	C	C	C	D	C
3	Dunearn	Highland	U/K	U/K	D	A	D	C	D	D	D	C	D	B	B	B	D	C
4	Glenbanvie	Perth	Estate	C Langton	D	C	D	D	D	D	D	D	D	C	B	C	D	C
5	Kinveachy	Highland	Forestry	B Dunlop	B	B	D	C	D	D	C	D	D	C	B	C	D	C
6	Glentruim	Highland	Forestry	Fountain	C	D	D	D	D	D	C	D	D	C	C	C	D	C
7	Doups Farm	Perth	Consult	D Hawker/ SW	C	B	D	C	D	D	D	D	D	C	A	B	D	C
8	Mar Lodge	Grampian	Forestry	G Cross/ Smiths Gore	D	C	D	D	D	D	D	D	D	C	D	C	D	D
9	Bolfracks	Perth	U/K	U/K	C	C	D	C	D	D	C	D	D	C	B	C	D	C
10	Dalnessie	Highland	Forestry	B Taylor/ Bell Ingram	C	B	C	B	C	B	B	C	D	C	A	A	D	B
11	Beinn Chreagach	Strathclyde	Consult	David Wathen	D	D	D	D	D	D	D	D	D	D	C	C	D	D
12	Black Clauchrie	Strathclyde	Consult	JT Lorimer	D	D	D	D	D	D	D	D	D	D	C	C	D	D
13	Lochlyoch	Strathclyde	Forestry	TEF	C	B	C	D	D	D	D	D	D	C	A	C	D	C
14	Burnfoot	Lothian	Forestry	TEF	D	A	C	C	D	D	D	D	D	C	B	C	D	C
15	Claonaig	Strathclyde	Consult	D Hawker/ SW	D	C	D	C	D	D	D	D	D	C	C	C	D	C
16	Garvault	Strathclyde	Forestry	SW	D	C	D	D	D	D	D	D	D	C	C	C	D	C
17	Arscaig	Highland	Forestry	B Taylor/ Bell Ingram	D	C	D	D	D	D	D	D	D	C	C	C	D	C
18	Invercharron	Highland	Forestry	Bell Ingram	D	C	D	D	D	D	D	D	D	C	C	C	D	C
19	Munsary	Highland	Forestry	Fountain	D	B	D	D	D	D	D	D	D	C	B	C	D	C
20	Invercassley	Highland	Forestry	Bell Ingram	C	B	D	D	D	D	D	D	D	C	C	C	D	C
21	Glencassley	Highland	Forestry	Bell Ingram	D	B	D	D	D	D	D	D	D	C	D	C	D	D
22	Dunrobin Glen	Highland	Forestry	B Taylor/ Bell Ingram	C	B	D	D	D	D	D	D	D	C	C	C	D	C
23	Philips Mains	Highland	Estate	J MacKay	D	B	D	D	D	D	D	D	D	C	C	C	D	C
24	Loch Hope	Highland	Consult	J Rathey	C	C	D	C	D	D	D	D	D	C	B	C	D	C
25	Beinn Leamhain	Highland	Forestry	TEF	D	C	D	D	D	D	D	D	D	C	C	C	D	C
26	Forest Farm	Highland	Forestry	Smiths Gore	C	C	D	D	D	D	D	D	D	C	C	C	D	C
27	Strathconnon	Highland	Forestry	R Wilson/ SW	D	C	D	C	D	D	D	D	D	C	C	C	D	C

ES Number	Property Name	Conservancy	Author type	Author	DESCRIPTION OF THE PROJECT		IDENTIFICATION &EVALUATION OF KEY IMPACTS				ALTERNATIVES & MITIGATION			COMMUNICATION				OVERALL GRADE
					Development description	Site description	Scoping	Baseline Conditions	Prediction of impact magnitude	Impact significance assessment	Alternatives	Mitigation	Monitoring	Presentation	Balance	Non-technical summary	Difficulties	
28	Castle Hill	Highland	Forestry	R Wilson/ SW	D	B	D	C	D	D	D	D	D	C	C	C	D	C
29	Kinlochteaculs	Highland	Forestry	D Hawker/ SW	D	C	D	D	D	D	D	D	D	C	D	C	D	D
30	Glenshiel, Cl & EG	Highland	Forestry	Lonsdale Forestry	C	C	D	D	D	D	C	D	D	C	C	C	D	C
31	Altnaharra	Highland	Forestry	Smiths Gore	D	D	D	D	D	D	D	D	D	C	C	C	D	D
32	Druim Liath	Highland	Forestry	Border Consultants	D	C	D	C	D	D	D	D	D	C	C	C	D	C
33	Glen Mor Estate	Highland	Forestry	BID Forest Consultancy	D	C	D	D	D	D	D	D	D	C	D	C	D	D
34	Braes of Abernethy	Highland	Forestry	Finlayson Hughes	D	C	D	D	D	D	C	D	D	C	C	C	D	C
35	Kinchurdy	Highland	Forestry	B Dunlop	D	C	D	D	D	D	D	D	D	C	C	C	D	C
36	Brabster	Highland	U/K	U/K	D	D	D	D	D	D	D	D	D	D	C	D	D	D
37	Braeroy	Highland	Forestry	TEF	D	D	D	D	D	D	D	D	D	D	D	C	D	D
38	Ardtornish	Highland	Forestry	A Robertson	D	C	D	D	D	D	D	D	D	D	D	D	D	D
39	Auchtertyre	Highland	Forestry	B Taylor/ Bell Ingram	D	D	D	D	D	D	D	D	D	C	B	D	D	D
40	Ardverikie	Highland	Forestry	Finlayson Hughes	B	B	D	D	D	D	D	D	D	C	B	B	D	C
41	West Willows	Highland	Consult	JJ Hall	D	B	D	D	D	D	D	D	D	C	B	C	D	C
42	Glen Uig	Highland	Forestry	B Cooper/ Tilhill	C	C	D	C	D	D	D	D	D	C	A	B	D	C
43	The Hope	Highland	Forestry	Fountain	D	D	D	D	D	D	D	D	D	C	C	C	D	D
44	Bhealaich	Highland	Forestry	Fountain	D	D	D	D	D	D	D	D	D	C	C	C	D	D
45	Strone	Strathclyde	Consult	D Hawker/ SW	D	B	D	D	D	D	D	D	D	C	B	C	D	C
46	Stronachullin	Strathclyde	Forestry	David Goss	B	C	D	D	D	D	D	D	D	C	B	C	D	C
47	Ardtaraig	Strathclyde	Consult	D Hawker/SW	D	C	D	C	D	D	D	D	D	C	B	B	D	C
48	Blackmount	Strathclyde	Forestry	SW	D	C	D	D	D	D	D	D	D	D	B	C	D	C
49	Ardchattan	Strathclyde	Estate	C Langton/ Atholl Estate	D	C	D	C	D	D	D	D	D	C	B	C	D	C
50	Traboyack Farm	Strathclyde	Consult	D Hawker/ SW	D	C	D	C	D	D	D	D	D	C	B	C	D	C
51	Clashbreck Ormsary	Strathclyde	Forestry	TEF	D	D	D	D	D	D	D	D	D	D	B	C	D	D
52	Barguillean	Strathclyde	Consult	E Lawrence	D	C	D	C	D	D	D	D	D	C	B	C	D	C
53	Inverchoalin	Strathclyde	Forestry	TEF	D	C	D	C	D	D	D	D	D	C	C	C	D	C

ES Number	Property Name	Conservancy	Author type	Author	DESCRIPTION OF THE PROJECT		IDENTIFICATION &EVALUATION OF KEY IMPACTS				ALTERNATIVES & MITIGATION			COMMUNICATION				OVERALL GRADE
					Development description	Site description	Scoping	Baseline Conditions	Prediction of impact magnitude	Impact significance assessment	Alternatives	Mitigation	Monitoring	Presentation	Balance	Non-technical summary	Difficulties	
54	Wandell Hill	Strathclyde	Consult	D Hawker/ SW	D	C	D	C	D	D	D	D	D	C	B	C	C	C
55	Pitcarmick	Perth	Forestry	M Taylor	D	C	D	D	D	D	D	D	D	D	D	C	D	D
56	Loch Oisinneach	Perth	Estate	C Langton/ Atholl Estate	D	D	D	D	D	D	D	D	D	D	B	C	D	D
57	Glen Derby	Perth	Estate	C Langton/ Atholl Estate	D	C	D	D	D	D	D	D	D	D	C	C	D	D
58	Auchtenny	Perth	Forestry	UA Forestry	D	C	D	C	D	B	D	D	D	C	B	C	D	C
59	Bishop Hill 2	Perth	Owner	D Shand	D	C	D	D	D	D	D	D	D	C	B	C	D	C
60	Glen Bruar	Perth	Estate	C Langton/ Atholl Estate	D	C	D	D	D	D	D	D	D	C	C	C	D	C
61	Nicolswalls	Perth	Forestry	SW	D	C	D	D	D	D	D	D	D	D	C	B	D	C
62	Talladh a Bheithe	Perth	Consult	D Hawker/ SW	D	C	D	C	D	D	D	D	D	C	B	C	D	C
63	Finnart & Invercomrie	Perth	Forestry	TEF	D	C	D	C	D	D	D	D	C	C	B	C	D	C
64	Clunes	Perth	Estate	C Langton/ Atholl Estate	C	C	D	D	D	D	D	D	D	C	B	C	D	C
65	Deuchary Hill	Perth	Estate	C Langton/ Atholl Estate	D	C	D	C	D	D	D	D	D	C	B	C	D	C
66	Auchleeks	Perth	Forestry	Finlayson Hughes	D	D	D	D	D	D	D	D	D	D	C	D	D	D
67	Queensberry	Dumfries	Estate	N Waugh	D	C	D	C	D	D	D	D	D	C	C	C	D	C
68	Cornharrow	Dumfries	Forestry	TEF	D	B	D	C	D	D	D	D	D	B	B	C	D	C
69	Little Cloak	Dumfries	Forestry	Thomson, Roddick + Laurue	D	B	D	D	D	D	D	D	D	C	D	C	D	D
70	Southdean	Lothian	Forestry	SW	D	B	D	D	D	D	D	D	D	C	C	C	D	C
71	Carnoch	Highland	Forestry	I M Forestry	C	B	D	D	D	D	D	D	D	C	C	C	D	C
72	Strath Tirry	Highland	Forestry	B Taylor/ Bell Ingram	D	B	D	C	D	D	C	D	D	C	C	C	D	C
73	Arisaig	Highland	Consult	D Hawker/ SW	D	C	D	C	D	D	D	D	D	C	B	C	D	C
74	The Biallain Craig Dhubh	Highland	Consult	D Hawker/ SW	D	C	D	D	D	D	D	D	D	C	B	C	D	C
75	Phones	Highland	Forestry	Finlayson Hughes	D	C	D	D	D	D	D	D	D	C	C	C	D	C
76	Lochluichart	Highland	Forestry	Bowlts	D	C	D	C	D	D	D	D	D	C	B	C	D	C
77	Rhidorroch Estate	Highland	Forestry	Bowlts	D	C	D	C	D	D	D	D	D	C	C	C	D	C

ES Number	Property Name	Conservancy	Author type	Author	DESCRIPTION OF THE PROJECT		IDENTIFICATION &EVALUATION OF KEY IMPACTS				ALTERNATIVES & MITIGATION			COMMUNICATION				OVERALL GRADE
					Development description	Site description	Scoping	Baseline Conditions	Prediction of impact magnitude	Impact significance assessment	Alternatives	Mitigation	Monitoring	Presentation	Balance	Non-technical summary	Difficulties	
78	Wester Guisachan	Highland	Forestry	TEF	C	B	D	C	D	D	D	D	D	C	B	C	D	C
79	Gairloch	Highland	Forestry	Bowlts	D	C	D	C	D	D	D	D	D	C	C	B	D	C
80	Glenkinglass	Strathclyde	Consult	D Hawker/ SW	D	C	D	D	D	D	D	D	D	C	B	C	D	C
81	Meikle Hill	Grampian	Forestry	A Mitchell/ MFS	D	B	D	D	D	D	D	D	D	C	B	C	D	C
82	Auchindare	Grampian	Forestry	J Clegg	D	C	D	C	D	D	D	D	D	C	B	C	D	C
83	Ballindalloch	Grampian	Estate	R Heape	D	C	D	D	D	D	D	D	D	C	C	C	D	C
84	Altyre	Grampian	Forestry	Bowlts	D	C	D	D	D	D	D	D	D	C	C	C	D	C
85	Foudland Hill	Grampian	Forestry	A Mitchell/ MFS	C	C	D	C	D	D	C	D	D	C	C	C	D	C
86	Meall an t-Suidhe	Highland	Estate	I MacKintosh-Hope	D	C	D	D	D	D	D	D	D	C	B	C	D	C
87	Creagan Breac Glenroy	Highland	Forestry	TEF	B	C	D	D	D	D	D	D	D	C	B	C	D	C
88	Temple Farm	Severn, Wye & Avon	Forestry	NCB	B	C	D	D	D	D	D	D	D	C	B	C	D	C
89	Stockwell Farm	Severn, Wye & Avon	Forestry	TEF	C	B	D	D	D	D	D	D	D	C	C	C	D	C

Maintaining Review Quality

Appendix 2.5

Quality Sample – 1st and 2nd review results

The Lee and Colley (1992) Environmental Statement Review Package does not include a formal system for comparing the results of the 1st and 2nd reviews, rather the two reviews were to be initially carried out independently and then the results re-examined where differences occurred and a final agreed result obtained through discussion. In this research (Chapter 4) each environmental statement was only reviewed once as it was not possible to have all 89 environmental statements 2nd reviewed. A sample of environmental statements was selected for 2nd review as a means of examining the quality and consistency of the review results. For this independent review a stratified sample of environmental statements was selected to give a range of conservancy, geographical locations, project type, size and year of publication. A total of 7 environmental statements, an 8% sample, were selected. Comparison of the results of the 1st and 2nd reviews of the 7 environmental statements sampled for second review is carried out following the methods used by Lowden (2000).

The following tables and figures show the results of the 1st and 2nd reviews of the 7 environmental statements sampled for 2nd review at sub-category, category and whole environmental statement levels.

Review sub-category results

Table 1 compares the results of the 1st and 2nd reviews. At the sub-category level in only 9 instances the scores of the two reviewers differed by greater than one grade. In Table 1 these instances are highlighted red. In all cases this was restricted to differences of a two grade shift. One environmental statement (Auchleeks) included four instances, two (Arisaig and Glenkinglass) included two instances and one further statement (Glen Uig) included one instance. Five instances occurred within the category dealing with the prediction of impact magnitude and 3 of these differences are found in one environmental statement (Auchleeks). In three of the environmental statements (Inverchoalin, Strath Tirry and Stockwell Farm) differences between the reviewers' grades were restricted to one grade difference.

Within Table 1 squares highlighted yellow indicate instances where the results of the 1st and 2nd review differ in terms of grading the sub-category as being adequate (A or B grade) or inadequate (C, D or N grade). There are 71 instances where the review results differ between grades B and C. Of the 9 instances highlighted red in Table 1, four of these indicate sub-categories where the two reviewers have differed over the adequacy of the environmental statement. Therefore there are 75 sub-categories where the 1st and 2nd reviewers have not agreed on the adequacy of the environmental statement. All 7 of the environmental statements include differences such as these. The smallest number of instances occurs in the Inverchoalin environmental statement (4) and the largest number occurs in the Strath Tirry environmental statement (22). 44 sub-categories contain these adequacy differences between the 1st and 2nd review results. 23 sub-categories contain a single instance, 7 sub-categories contain 2 instances, 8 sub-categories contain 3 instances and 3 sub-categories contain 4 instances. Over 65% of these adequacy differences occurred within four review categories – development description (11 instances), scoping (13), baseline conditions (14) and prediction of impact magnitude (11).

Table 1 Comparison of 1st and 2nd review results – sub-category level

Environmental Statement	Inverchoalin		Glen Uig		Auchleeks		Strath Tirry		Glenkinglass		Arisaig		Stockwell Farm	
Review (1st/2nd)	1	2	1	2	1	2	1	2	1	2	1	2	1	2
1 DESCRIPTION OF THE PROJECT & LOCAL ENVIRONMENT														
1.1 Development description														
1.1.1 Project objectives	D	C	C	B	B	B	C	B	C	B	C	B	B	B
1.1.2 Extent	B	C	A	B	B	C	A	B	A	A	A	B	B	B
1.1.3 Phases of the project	D	D	D	C	D	C	D	N	N	N	N	N	N	N
1.1.4 Design/work methods	B	C	B	C	C	C	C	D	B	C	D	N	B	C
1.1.5 Inputs	D	C	D	C	B	B	D	N	N	N	N	N	N	N
1.1.6 Access	D	D	D	C	C	C	D	D	D	C	N	N	C	B
1.1.7 Residues & emissions	N	N	D	D	C	C	D	N	N	N	N	N	N	N
1.1.8 Associated Works	N	N	D	C	D	C	N	N	N	N	N	N	N	N
1.2 Site description														
1.2.1 Location	B	C	A	B	B	B	B	B	B	A	B	C	C	B
1.2.2 Present land use	B	B	C	C	C	B	B	B	D	B	D	N	B	A
1.2.3 Neighbouring land uses	C	C	D	C	C	B	C	N	C	B	D	C	D	D
1.2.4 Special designations	D	C	C	C	C	B	N	N	C	C	D	C	C	C
2 IDENTIFICATION &EVALUATION OF KEY IMPACTS														
2.1 Scoping														
2.1.1 Reason for ES	N	N	C	C	N	N	D	C	C	B	D	N	C	C
2.1.2 Identification of affected parties	N	N	D	C	N	N	B	B	D	N	C	C	D	D
2.1.3 Local authority(s)	N	N	N	N	N	N	B	B	D	N	B	C	C	C
2.1.4 Statutory consultees	D	N	C	B	N	N	C	B	C	C	C	B	N	N
2.1.5 Expert advice	N	D	C	B	D	N	C	B	N	N	D	C	B	B
2.1.6 Local groups	N	N	N	N	N	N	N	N	N	N	C	B	N	N
2.1.7 General public	N	N	N	N	N	N	N	N	N	N	C	B	N	N
2.1.8 Action groups	N	N	N	N	N	N	N	N	N	N	D	N	N	N
2.1.9 Method of impact identification	N	N	D	C	N	N	C	B	N	N	N	N	C	C
2.1.10 Reasons for in/excluding	N	N	N	N	N	N	D	C	N	D	N	N	B	C
2.1.11 Conformation with best practices	N	N	N	N	N	D	C	B	N	N	D	C	C	D
2.1.13 Identification of potentially sig. impacts	N	N	C	C	N	N	C	B	D	C	C	C	B	C
2.2 Baseline Conditions														
2.2.1 Geology	D	C	D	C	C	B	B	B	D	C	C	C	D	D
2.2.2 Soils	D	N	D	C	C	B	B	B	D	C	D	N	C	C
2.2.3 Flora	C	C	C	B	D	B	B	A	C	B	C	C	B	A
2.2.4 Fauna	D	C	D	C	D	C	C	C	D	D	C	C	B	A
2.2.5 Water	D	D	D	C	N	N	B	A	D	C	D	D	C	C
2.2.6 Climate	N	N	D	C	N	N	D	C	N	N	N	N	N	N
2.2.7 Air	N	N	D	D	N	N	N	N	N	N	N	N	N	N
2.2.8 Landscape	B	C	B	C	C	B	C	B	D	D	C	D	C	C
2.2.9 Topography	D	N	B	B	C	C	C	C	D	D	C	D	D	D
2.2.10 Material assets	D	D	N	N	N	N	C	N	N	N	N	N	N	N
2.2.11 Human beings	D	N	D	C	D	N	N	N	D	D	D	D	N	N
2.2.12 Habitation	D	N	C	B	N	N	N	N	N	N	N	D	N	N
2.2.13 Recreation	D	N	D	C	D	N	N	N	D	C	D	D	D	D
2.2.14 Access	D	C	N	N	N	N	D	C	D	C	D	N	D	D

2.2.15 Visual	D	N	B	B	N	N	C	B	D	C	N	D	C	D
2.2.16 Cultural heritage	D	D	C	B	D	C	B	C	C	D	B	C	B	A
2.2.17 Employment	N	N	N	N	D	N	D	D	D	C	D	C	N	N
2.2.18 Methods of assessment	N	N	N	N	N	N	C	D	N	D	C	C	C	C
2.3 Prediction of impact magnitude														
2.3.1 Variable affected clearly stated	N	N	D	C	D	C	C	B	D	B	C	A	D	D
2.3.2 Deviation from baseline	N	N	C	C	N	N	B	A	N	D	D	C	C	C
2.3.3 Magnitude	N	N	D	C	D	C	C	B	D	C	D	C	C	C
2.3.4 Duration	N	N	C	C	N	C	B	B	D	D	N	N	D	D
2.3.5 Reversibility	N	N	D	C	N	N	N	N	N	N	N	N	D	D
2.3.6 Probability	D	D	D	C	N	C	C	C	N	N	N	N	N	N
2.3.7 Confidence in prediction	D	D	D	C	N	C	C	B	C	B	C	B	D	D
2.3.8 Cumulative impacts	N	N	C	B	N	C	N	N	N	N	N	N	N	N
2.3.9 Relation to (inter)national standards	N	N	N	N	N	N	C	C	C	B	N	N	N	N
2.3.10 Basis for prediction	N	N	C	C	N	N	C	B	N	N	N	D	D	D
2.3.11 Assumptions	N	N	N	N	N	N	C	B	N	N	N	N	D	D
2.4 Impact significance assessment														
2.4.1 Approach to evaluation	N	N	N	N	N	N	C	B	D	D	C	A	D	D
3 ALTERNATIVES & MITIGATION														
3.1 Alternatives														
3.1.1 Alternative work methods	N	N	N	N	N	N	C	B	N	N	D	N	N	N
3.1.2 Alternative uses of site	D	D	D	C	N	N	D	C	D	N	D	C	N	N
3.1.3 Alternative sites	N	N	N	N	N	N	N	N	N	N	N	N	N	N
3.1.4 Zero option	D	N	D	N	N	N	C	C	C	C	C	C	N	N
3.1.5 Reasons for selecting proposal	D	N	D	N	D	C	C	C	N	N	D	C	N	N
3.2 Mitigation														
3.2.1 Avoidance of impacts	N	N	N	N	D	N	C	C	N	C	C	D	D	C
3.2.3 Reduction of impacts	N	N	D	N	N	D	C	C	D	D	N	D	N	N
3.2.4 Compensatory actions	N	N	N	N	N	N	D	C	N	N	N	N	N	N
3.2.5 Remedial actions	N	N	N	N	N	N	D	C	N	N	N	N	N	N
3.2.6 Residual Impacts	N	N	N	N	N	N	N	N	N	N	N	N	N	N
3.3 Monitoring														
3.3.1 Consideration of impacts to monitor	N	N	D	N	N	N	C	C	N	N	D	N	N	N
3.3.2 Monitoring responsibility	N	N	D	N	N	N	C	D	N	N	D	N	N	N
3.3.3 Frequency	N	N	N	N	N	N	D	C	N	N	N	N	N	N
3.3.4 Action to be followed in event of problems	N	N	N	N	N	N	D	D	N	N	N	N	N	N
3.3.5 Provision for audit	N	N	N	N	N	N	D	D	N	N	N	N	N	N
4 COMMUNICATION OF RESULTS														
4.1 Presentation														
4.1.1 Identification & contact addresses	C	D	B	C	D	D	A	B	B	C	A	B	B	B
4.1.2 Comprehensiveness	C	D	B	C	D	D	C	C	D	D	C	D	C	C
4.1.3 Glossary	D	D	N	N	N	N	N	N	N	N	N	N	N	N
4.1.4 Summaries	D	D	N	C	D	C	N	N	N	D	D	D	C	C
4.1.5 Maps	D	D	C	C	B	A	C	B	B	B	B	B	C	B
4.2 Balance														
4.2.1 Bias	C	D	B	C	D	C	C	B	B	C	B	B	C	C

4.2.2 Undue emphasis	C	D	B	C	C	C	C	B	B	B	B	B	B	B
4.3 Non-technical summary														
4.3.1 Clarity	D	D	C	C	D	D	D	D	D	D	C	C	D	D
4.3.2 Comprehensive	C	D	B	C	D	D	C	C	D	D	D	D	C	D
4.3.3 Non-technical	D	D	B	C	D	D	B	C	A	B	B	C	D	D
4.4 Difficulties in ES production														
4.4.1 Technical	N	N	N	N	N	N	C	B	C	N	N	N	N	N
4.4.2 Organisational	N	N	N	N	N	N	N	N	N	N	N	N	N	N
4.4.3 Knowledge based	N	N	N	N	N	N	C	B	N	N	N	N	N	N

Figure 1 shows the distribution of sub-category grade scores in the 1st and 2nd review for each of the 7 environmental statements. Visual assessment identifies similarities between the reviews of Auchleeks, Inverchoalin, Glenkinglass, Arisaig and Stockwell Farm, and differences within the Glen Uig and Strath Tirry reviews.

Figure 2 shows the total number of A, B, C, D and N grades (no N/A grades were awarded) awarded between all 7 of the environmental statements by the 1st and 2nd reviewers. The figure shows that the 1st review has consistently awarded fewer A (58% of the 2nd review), B (71% of the 2nd review) and C (80% of the 2nd review) grades, but awarded almost twice as many D grades than the 2nd review. Except for the difference of D grades awarded the patterns of distribution are similar.

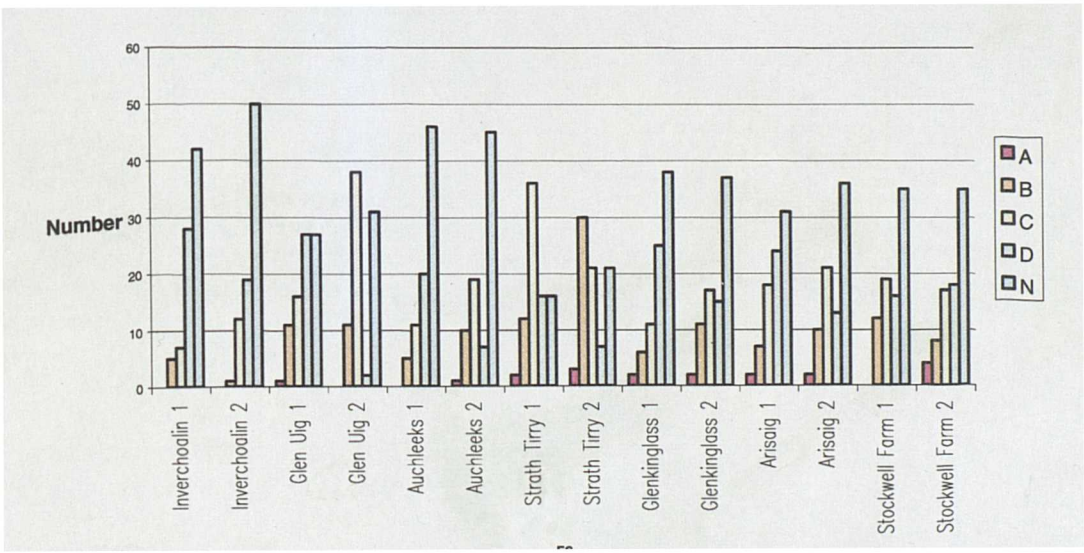


Figure 1 1st and 2nd review grade scores for the 7 environmental statements.

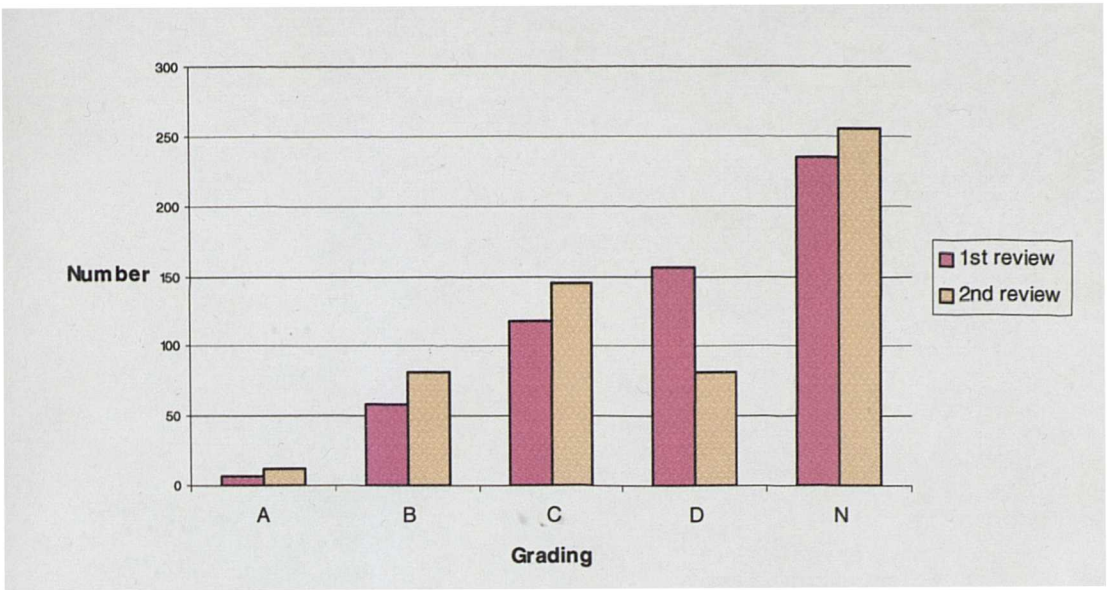


Figure 2 Number of each grade awarded at sub-category level in all 7 environmental statements.

Review category results

At the category level, in 4 instances the scores of the two reviewers differed by greater than one grade. These instances are highlighted red in Table 2. One environmental statement (Strath Tirry) included two of these differences, both of which were within the review area concerned *with identification and evaluation of key impacts, namely scoping* and the prediction of impact significance. The other differences were within the results for the Auchleeks environmental statement regarding site description and the Arisaig environmental statement regarding the development description. No differences were greater than two grade points. Within Table 2 category grades highlighted yellow indicate instances where the 1st and 2nd reviewers failed to agree on the adequacy of the environmental statement. Of the 12 instances 4 are attributed to one review category, *regarding site description. One* environmental statement, Strath Tirry, accounts for 6 instances.

Table 2 Comparison of 1st and 2nd review results – category level.

Environmental Statement	Inverchoalin		Glen Uig		Auchleeks		Strath Tirry		Glenkinglass		Arisaig		Stockwell Farm	
Review (1st/2nd)	1	2	1	2	1	2	1	2	1	2	1	2	1	2
Development description	D	C	C	C	D	C	D	C	D	C	D	B	C	C
Site description	C	C	C	C	D	B	B	C	C	B	C	B	B	B
Scoping	D	D	D	C	D	D	D	B	D	C	D	C	D	D
Baseline Conditions	C	D	C	C	D	D	C	B	D	C	C	D	C	D
Prediction of impact magnitude	D	D	D	C	D	C	D	C	D	C	D	C	D	D
Impact significance assessment	D	D	D	D	D	D	D	B	D	D	D	C	D	D
Alternatives	D	D	D	C	D	D	C	C	D	C	D	C	D	D
Mitigation	D	D	D	D	D	D	D	C	D	D	D	D	D	D
Monitoring	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Presentation	C	D	C	C	D	D	C	B	C	C	C	C	C	C
Balance	C	D	A	B	C	C	C	B	B	B	B	B	B	C
Non-technical summary	C	D	B	C	D	D	C	C	C	D	C	C	D	C
Difficulties	D	D	D	D	D	D	D	C	D	D	D	D	D	D

Overall ES results

At overall environmental statement level, in only one case, Strath Tirry, did the grades of the two reviews fail to agree (highlighted yellow in Table 3). This difference can be attributed to the two differences of 2-grades at category level within the review area concerned with identification and evaluation of key impacts in which the 2nd review awarded consistently higher grades and three instances at category level where the 2nd reviewer considered the environmental statement to be adequate and awarded a B grade while the 1st reviewer considered the environmental statement to be below an adequate level and awarded a C grade.

Table 3 Comparison of 1st and 2nd review results – whole environmental statement level.

Environmental Statement	Inverchoalin		Glen Uig		Auchleeks		Strath Tirry		Glenkinglass		Arisaig		Stockwell Farm	
Review (1st/2nd)	1	2	1	2	1	2	1	2	1	2	1	2	1	2
Overall ES grade	C	C	C	C	D	D	C	B	C	C	C	C	C	C

Lowden (2000) uses the method of calculating overall scores for environmental statements to assist the comparison of 1st and 2nd reviews. The Environmental Statement Review Package explicitly uses an alphabetical grading system to discourage simple addition of sub-category grades and stresses the importance of the subjective consideration of the reviewer when aggregating scores up the review hierarchy. However, for the purposes of comparing the review results of the 1st and 2nd reviews at category level this can help identify where differences of opinion are present. It is important to note this technique is used only to compare the results of the two reviews and is not part of the review methodology used in Chapter 4. Within Table 4 the total number of grades assigned to each category are given a weighted score (A=5, B=4, C=3, D=2, N=1), and the category score totalled for the 1st and 2nd review results. Table 4 shows that the 1st review awarded lower review grades within the categories of site description, scoping, baseline data, and prediction of impact magnitude, impact significance assessment and mitigation, but higher grades for monitoring, presentation, balance and non-technical summary. However taken as a percentage of the total score, in only two categories is the difference between the 1st and 2nd review greater than 10%: prediction of impact magnitude and prediction of impact significance. These reinforce the earlier identification of three instances of grade awards differing by two grades within the former and one instance within the latter. However the small number of data points within the category concerned with prediction of impact significance should be noted when considering these figures. Figure 3 illustrates the overall similarity of grades awarded in the 1st and 2nd reviews by review category. The differences in grades awarded in the prediction of impact magnitude and prediction of impact significance can be seen.

Table 4 Grade and score results for the 1st and 2nd reviews at category level for all 7 environmental statements.

	Grade						Score					Total score	Difference 1st - 2nd
	A	B	C	D	N		5	4	3	2	1		
Development Description 1	4	10	9	17	16		20	40	27	34	16	137	0
Development Description 2	1	12	18	5	20		5	48	54	10	20	137	
Site Description 1	0	9	11	7	1		0	36	33	14	1	84	8
Site Description 2	2	11	11	1	3		10	44	33	2	3	92	
Scoping 1	0	6	20	14	44		0	24	60	28	44	156	11
Scoping 2	0	14	18	5	47		0	56	54	10	47	167	
Baseline data 1	0	13	27	50	36		0	52	81	100	36	269	21
Baseline data 2	5	15	38	23	45		25	60	114	46	45	290	
Prediction of Impact Magnitude 1	0	2	15	22	38		0	8	45	44	38	135	36
Prediction of Impact Magnitude 2	2	11	21	11	32		10	44	63	22	32	171	
Prediction of Impact Significance 1	0	0	2	2	3		0	0	6	4	3	13	3

Prediction of Impact Significance 2	1	1	0	2	3		5	4	0	4	3	16	
Alternatives 1	0	0	5	12	18		0	0	15	24	18	57	0
Alternatives 2	0	1	9	1	24		0	4	27	2	24	57	
Mitigation 1	0	0	3	6	26		0	0	9	12	26	47	4
Mitigation 2	0	0	6	4	25		0	0	18	8	25	51	
Monitoring 1	0	0	2	7	26		0	0	6	14	26	46	-4
Monitoring 2	0	0	2	3	30		0	0	6	6	30	42	
Presentation 1	2	7	10	7	9		10	28	30	14	9	91	-2
Presentation 2	1	7	9	11	7		5	28	27	22	7	89	
Balance 1	0	7	6	1	0		0	28	18	2	0	48	-2
Balance 2	0	6	6	2	0		0	24	18	4	0	46	
NTS 1	1	4	5	11	0		5	16	15	22	0	58	-7
NTS 2	0	1	7	13	0		0	4	21	26	0	51	
Difficulties 1	0	0	3	0	18		0	0	9	0	18	27	0
Difficulties 2	0	2	0	0	19		0	8	0	0	19	27	

A similar scoring process is illustrated in Table 5 where the grade results of the 1st and 2nd reviews for each environmental statement have been converted to category level scores using the same scoring method (A=5, B=4, C=3, D=2, N=1). Table 5 shows that the 2nd review has awarded higher grades in all but one of the environmental statements (Inverchoalin). However the differences between the 1st and 2nd review results are small. Taken as a percentage of the total score of the two reviews the measure of difference ranges from 0.5% in Stockwell Farm environmental statement to 7% in the Auchleeks environmental statement. This would provide agreement with the analysis of the raw data above, which identified Auchleeks as having four of the eight instances where sub-category differences of two grades were identified and Stockwell Farm as having no instances of awards differing by more than one grade.

The results show that while there is difference of opinion between reviewers at sub-category level the overall awarding of grades is comparable when looked at by environmental statement or by review elements. The results also highlight the subjectivity of the review process. While the Auchleeks environmental statement is shown as including a number of differences between the two reviewers at sub-category level, and at category level the overall grade was the same. The Strath Tirry environmental statement is the only environmental statement were the overall grade awarded differed in the 1st and 2nd review. However the analysis of sub-category grades identified no instances of differences greater than one grade. The differences in the Strath Tirry results appear to come about during the aggregation process up the review hierarchy, which is accepted as being subjective. The review of the 89 environmental statements with Chapter 4 can be seen as having carried out with a continuous degree of rigour and provides consistent results which are comparable with those obtained from independent 2nd review.

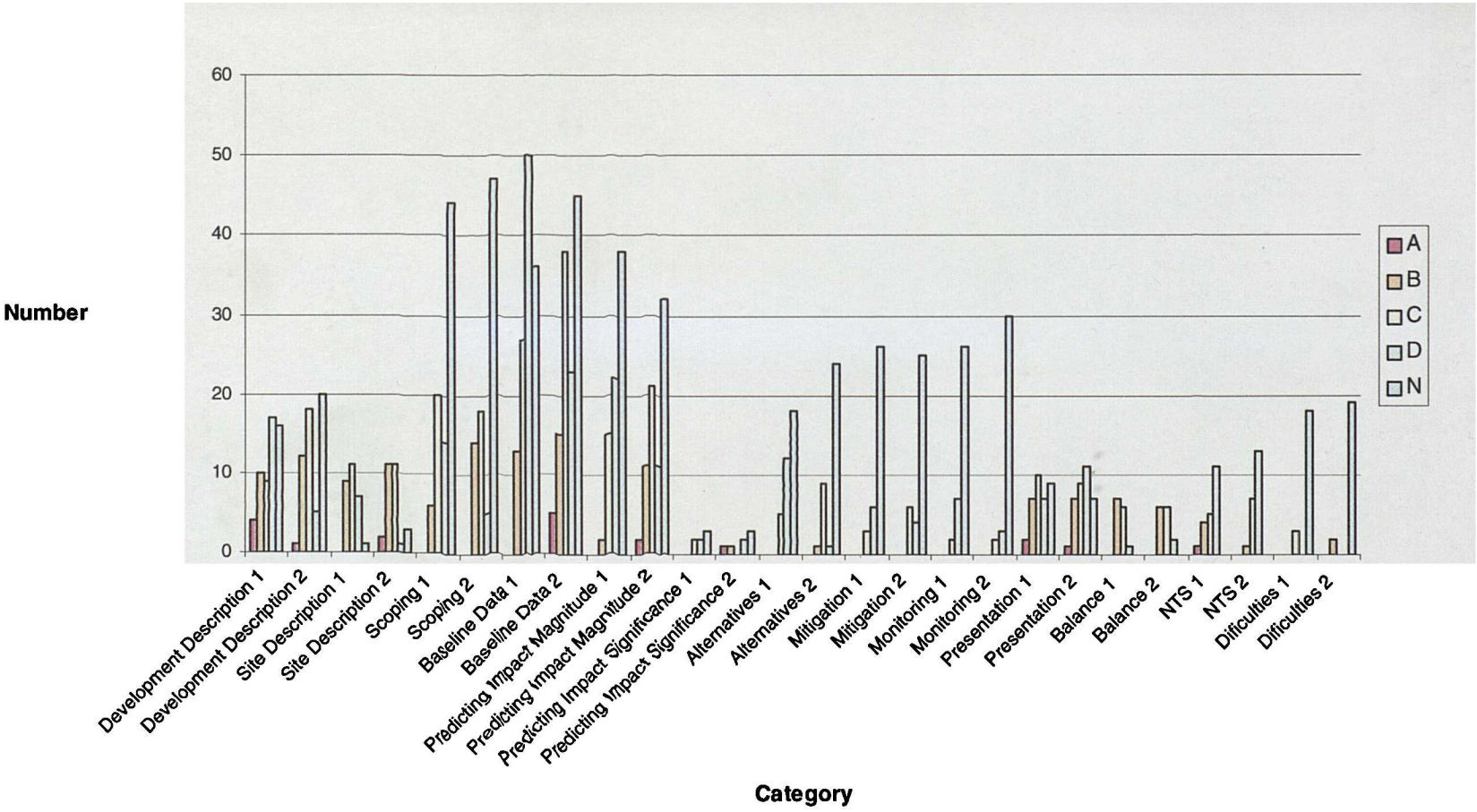


Figure 3 1st and 2nd review sub-category grade scores

Table 5 Score results for the 7 environmental statements by category.

Environmental Statement	Development description	Site description	Scoping	Baseline Conditions	Prediction of impact magnitude	Impact significance assessment	Alternatives	Mitigation	Monitoring	Presentation	Balance	NTS	Difficulties	Total score	Difference 1st - 2nd
Inverchoalin 1	18	13	13	35	13	1	8	5	5	12	6	7	3	139	-11
Inverchoalin 2	18	13	13	31	13	1	6	5	5	10	4	6	3	128	
Glen Uig 1	22	12	22	41	24	1	8	6	7	13	8	11	3	178	15
Glen Uig 2	25	13	26	50	30	1	7	5	5	13	6	9	3	193	
Auchleeks 1	25	13	13	32	13	1	6	6	5	11	5	6	3	139	22
Auchleeks 2	26	16	13	36	23	1	7	6	5	13	6	6	3	161	
Strath Tirry 1	21	12	30	48	31	3	12	11	12	13	6	9	7	215	18
Strath Tirry 2	16	10	37	52	37	4	14	13	12	13	8	8	9	233	
Glenkinglass 1	18	12	19	33	17	2	8	6	5	13	8	9	5	155	17
Glenkinglass 2	19	16	20	41	24	2	7	8	5	12	7	8	3	172	
Arisaig 1	15	10	29	39	16	3	10	7	7	15	8	9	3	171	4
Arisaig 2	14	10	31	37	23	5	11	7	5	13	8	8	3	175	
Stockwell Farm 1	19	12	30	41	21	2	5	6	5	14	7	7	3	172	2
Stockwell Farm 2	19	14	27	43	21	2	5	7	5	15	7	6	3	174	

APPENDIX 3

CASE A

Description of the Proposals

The proposals cover 97.5 ha of hill ground in Argyll and Bute district of Strathclyde. The scheme consists of the following:

Species	*Area (ha)*	*%*
Native broadleaf planting	79.4	81
Shrub planting	3.1	3
Open ground	15.0	16
Total	97.5	

Objectives

The objectives of the scheme are:

- To change from extensive hill farming to native broadleaved woodland
- To enhance the landscape and nature conservation interest of the site
- To provide shelter for deer, and
- To diversify the agricultural base of the hill farming unit.

The intention of this WGS is to establish a new native broadleaved woodland. The proposed woodland will provide an important habitat for upland flora and fauna in years to come.

Establishment Techniques

The new planting areas will be deer-fenced against stock, with deer being rigorously controlled. Cultivation will be carried out by mechanical mounding to ensure good early establishment of planting stock. Where ground conditions are unsuitable for mounding, hand screefing will be carried out. A cultivation plan will be prepared and agreed with the Forestry Authority prior to works commencing. Removal of grazing by stock and deer should result in limited natural regeneration of pine, birch and willow, where there are suitable seed sources. Mounding techniques will adhere to the current guidelines (3rd Edition Forest and Water Guidelines. RIN 196 Forest Drainage by DG Pyatt), with planting no closer than 5 metres from the water courses shown on the planting map.

Fences will be maintained; beating up operations will be carried out to ensure adequate stocking; and hand weeding as necessary will be undertaken. Fire precautionary measures will be taken. Deer and vermin will be controlled.

Access to the site will be by the existing forest and estate roads to Glen Kinglass Cottage at NGR NN 168383. There will be no additional impact on the landscape or conservation interest to this point. There will be no additional track construction.

All forestry operations will be carried out in accordance with the following Forestry Commission publications:

- Forest and Water Guidelines (3rd Edition)
- Forest and Landscape Guidelines
- Forest Nature Conservation Guidelines
- The Management of Semi-natural Woodlands
- Creating New Native Woodland (Bulletin 112)
- The Use of Herbicides in the Forest

Description of the Site

The site is located approximately 25 km ENE of Oban, 7 km E of Loch Etive, in an area used for extensive stock farming and some forestry. The site adjoins a number of other forests and is recognised in the Strathclyde Region Structural Plan: Indicative Forestry Strategy as being within the *Potential Zone*

for afforestation. Landscape issues are recognised as being particularly important within this area, although the area is not within any local, regional or national designated area in Argyll and Bute Council's Structure Plan.

The site is part of a larger estate containing hill sheep farm and deer forest, covering 3812.5 ha of hill land. The proposed land use, if approval for this scheme is given, would result in native woodland being extended further up the valley of the River Kinglass. Almost the whole site is overlain by varying depths of peat which is usually shallow but in parts has accumulated to depths of < 1.5 metres. There are isolated small and very local areas of mineral soil, on the numerous knowes, particularly around the small burn in the western section of the site. The site is characterised by a large number of burns, channels and flushes with water flowing freely on many surfaces. Flushed areas are particularly prominent in the SE tongue of he site.

The majority of the site is covered with a deergrass-bog heath association. On the drier knowes there are small areas of heather and cross leaved heather. In the valley bottom the vegetation is dominated by bog myrtle and there are a few small areas of blanket mire and three small pools. There are a number of heavily browsed rowan throughout the site and a small number of downy birch and alder. There is no specific information available on the fauna found in the area. There are no recorded ancient monuments on the site.

Consultees Comments

Senior Agricultural Officer, The Scottish Office Agriculture, Environment and Fisheries Department

- SOAFD has no objections on agricultural grounds to the planting proposals contained in the above application.

Area Officer, Scottish Natural Heritage

- The area to be planted at 97.5 ha is not large and will not lead to a drastic change in the relationship between open ground and that which is tree covered within Glen Kinglass. There is therefore unlikely to be any significant impact on red deer, other mammals or birds.
- Given that the intention is to create a native woodland we would wish to ensure that appropriate tree species are planted in suitable areas and that no plant communities such as those found on mire systems would be adversely affected. We would therefore request that a vegetation survey to NVC standard is carried out and that the subsequent planting scheme follows the EC Bulletin on Creating New Native Woodlands.

Environmental Protection Team Member, Scottish Environment Protection Agency

- We feel confident that the details provided in the draft WGS application confirm our view that the scheme as proposed, offers no cause for concern to the Agency.

Technical Director, Red Deer Commission

- We agreed that a concise Deer Management Plan should be annexed to the proposal and built into the contract.
- The proposals for the scheme are acceptable to the Commission.

West of Scotland Archaeology Service

- Desk-based assessment revealed no recorded archaeological sites within the application area.
- A site visit confirmed the generally marginal topography of the area for human settlement. This visit revealed one unrecorded site in the area related to transhumance farming. This is the site of a group of sheilings centred on NN 17673873. These require to be maintained in their present state in open ground. I understand that the preservation of these remains will be achieved by moving the edge of the open ground in the valley floor upslope to include them. The location of the site including a 20-metre buffer zone is marked in red on the attached map extract.

Forestry Commission Research Branch, Alice Holt

Although next to a CLA exceeded square the proposal will not require a CLA, as the proposal is exclusively broadleaved.

CASE B

Description of the Proposals
The proposals cover 359.9 ha of hill ground between Loch nan Ceall and Loch Nan Uamh in Lochaber District. The scheme is one of natural regeneration of broadleaved woodland. The scheme is made up as follows:

Block 1 88.8 ha
Block 2 271.1 ha
359.9 ha

The objectives of the scheme are to:
- Improve the landscape through regeneration of fragments of the semi-natural and long established plantation broadleaved woodland.
- Increase the conservation interest of the site through increasing native broadleaf woodland.

The areas to be regenerated will be fenced against deer/stock by erecting new fences where none exist and by upgrading and heightening existing fences. No ground preparation is required but control of rhododendron will be carried out where required liaising with SNH where chemicals may be used and carrying out COSSH assessments to safeguard water supplies and rare vegetation.

Fence re-alignment and control of regeneration will safeguard archaeological features elsewhere by liaison with HRC Archaeologist. Due to the exclusion of deer from the area a deer management plan has been prepared with the assistance of the RDC.

Description of the Site
Arisaig Estate is situated on the Rhu peninsula, Strath of Arisaig and Glen Mama deer forest in Lochaber District, an area dependent largely on crofting, fishing, agriculture and tourism. The Estate extends to approximately 3368 ha, lying partly in the Morar, Moidart and Ardnamurchan National Scenic Area. It is recognised in the Highland Region Structure Plan as being in an area designated as sensitive for forestry due to reasons of landscape.

Three areas are designated within the Estate as SSSI – Glen Beasdale (coastal oakwood on acid soils, diverse lichen flora, geological feature), Loch Dubh (small moorland loch of moderate nutrient status, nationally rare Club Sedge) and Druimindarroch (geological feature - development of microcline crystals and folding). The latter two fall within the proposal area.

There are a number of sites identified as ancient or long established woodland of semi-natural origin in the area. The area is currently rough and low ground grazing with heather moorland grazed by sheep and red deer, with areas of amenity, coniferous and broadleaved woodland.

The area around Rhumach contains a very sparse cover of native woodland (oak, rowan and birch) scattered between difficult, rocky terrain. The remainder of the ground is low hill grazing predominantly of purple moorgrass and heather. Around Druim and Dubh-leathaid there are considerable areas of native woodland (oak, alder, rowan, hazel and birch) extending to 40 ha. As with Rhumach, the ground is low hill grazing with some rocky knolls and ridges. The area includes the 6 ha Loch Dubh with its emergent and marginal vegetation characteristics of a mesotrophic loch.

There are numerous archaeological sites within the WGS area. Within Area 2 there is a large cup marked boulder of neolithic date – NMRS listed. Area 1 contains a late prehistoric age fortified settlement. There are a number of old crofts and cultivation sites on both areas. Just outside the WGS area a Bronze Age cist was found and a crannog is listed in the NMRS.

Tourists frequently drive or walk along the public road leading to Arisaig, around the Rhu peninsula to enjoy the dramatic views and coastal scenery. Members of the local community enjoy informal usage of a number of roads and paths for walking within the site.

Consultees Comments

Conservation Officer, The Royal Society for the Protection of Birds

- There is a long established golden eagle territory in Glen Beasdale which, unfortunately, rarely seems to be successful. This could be due to disturbance, however in common with many western sites food shortage may also be a problem.
- The remainder of the site has never been properly surveyed. However, it is unlikely that it will differ greatly from similar sites in Lochaber which, in general, only support relatively common species.
- Afforestation schemes of this nature are likely to be of benefit to both eagles and commoner species by increasing the amount of semi-natural habitat and species which it supports.

Regional Archaeologist, Highland Regional Council

- From studying the aerial photographs there appear to be features of interest within the area, notably around Rhemore, Millburn and Loch Dubh. Some of the 'old shielings' n the area were clearly more permanent settlement, with cultivation areas but there appear to be shielings further into the hill, probably associated with each of them. There is also an area of cultivation in Glen Beasdale which needs looking at.
- More information might be found in the Deer Forest Commission and the 1811 census. Also Fraser-Mackintosh's *Antiquarian Notes* of 1897 contains material of interest.

Area Officer, Scottish Natural Heritage

- As the WGS is for regeneration and not planting we do not consider it necessary to provide a description of the vegetation communities in the proposed woodland areas.
- The Loch Dubh SSSI contains the rare sedge *Carex buxbaumii* which only exists in three sites in the UK and could be affected by alterations to the water table and lack of grazing.
- The principal aspect of the scheme which would affect the landscape is the erection of fences.
- What is known about the deer numbers in the area? What will be the effect of the position of the deer pass on the Druimindarroch SSSI?

Director of Planning, Highland Regional Council

- Part of the proposals lie within the Morar, Moidart and Ardnamurchan National Scenic Area. Two SSSI (Glen Beasdale and Loch Dubh) are covered by the proposals.
- The proposals lie within the Indicative Forestry Strategy *SENSITIVE* policy zone, where a limited range of forestry types is acceptable. Where planting or natural regeneration is appropriate it should be primarily for nature conservation or amenity purposes.
- The area contains spectacular coastal and inland scenery. The initial fencing works constitutes the most likely effect on the landscape. Fencing in these areas requires particular attention particularly in association with public roads and walking routes.
- I am happy that photomontage covering the wider landscape is not necessary. However this may be beneficial to demonstrate fencing proposals over specific areas.
- The Steamboat porter's House has a private water supply located in Block 1.

Highland River Purification Board

- Request that Guidelines be adhered to.

Senior Deer Officer, Red Deer Commission

- The proposals were discussed at the last Commission meeting and there was no disagreement. The scheme and proposals which have now been submitted are acceptable.

CASE C

Description of the Proposals
The proposals cover 619.3 ha of hill ground in the East Kilbride District of Strathclyde. The scheme is made up as follows:

New planting conifer	520.4 ha
New planting broadleaves	29.4 ha
Open ground	69.5 ha
Total	619.3 ha

The area will be ploughed with a double mouldboard plough, deep or shallow as required at 4 m spacing and cross drained as necessary. Fences will be improved to stockproof condition. Planting will be at 2.0 m x 2.0 m spacing giving a stocking of about 2500 plants per hectare using mainly SS but also mixtures of SS with LP on deeper peats. Areas of JL or HL will be used in the interests of visual amenity and up to 5% of the area will be planted with native broadleaved species (in approximately equal quantities, species to include birch, rowan, alder). Broadleaves will be planted in grow-tubes at 3.0 m spacings.

Ploughing, drainage and conifer planting will stop short of perennial streams (15 m either side). Where a perennial stream is in the water catchment area of Kype reservoir ploughing operations will stop 50 m short on either side. Between 30 m and 50 m either side there will be only turf planting with mixed broadleaves. A strip 30 m either side of the streams will be left unplanted.

In the area of the Kype reservoir catchment, all fertiliser will be applied by hand after ploughing and the Water Authority will be consulted before any other chemicals are applied. The forest drainage system will be adapted to increase the catchment area of the Kype reservoir by careful diversion of water from suitable adjacent areas mainly from an area to the north of Harting Rig (see accompanying map). All operations will be carried out in accordance with the Forestry Commission's Forests and Water Guidelines.

PK fertiliser will be applied at 650 kg/ha – aerial application or 575 kg/ha – hand application subject to Water Board approval.

Future weeding and beating up to be carried out as necessary. Deer, rabbits, hares and other animals injurious to the crop will be controlled. Liaison will be maintained with the local Fire Brigade.

Negotiations will take place with East Kilbride District Council with a view to agreeing 3 access routes to the monument via Lambhill Farm, Kype reservoir and Powbrone Burn. No planting will take place within a 100 m radius of Auchingilloch monument.

Description of the Site
The site is located approximately 6 km west of Straven in an area used mainly for forestry and hill farming. The site is located near a number of other forests and is recognised in the Strathclyde Region Structure Plan: Indicative Forestry Strategy as being within the potential zone for afforestation. The site is not prominent from any major road or walking route, although a long distance footpath runs through the site, and it can be seen in the middle distance from the town of Straven. The site adjoins older Forest Enterprise forest blocks and will in-fill open land between existing plantations.

No specific information is available on fauna.

The existing vegetation cover is heather moorland which has been grazed by sheep and less recently been used for sporting purposes. There are a number of small water courses running through the site. Much of the site is covered by peat of varying depth – a proportion of the site is thought to have peat depths in excess of 60 cm. There are a number of mire vegetation associations throughout the site – although no specific information is available.

The site constitutes approximately 10% of the catchment area of the Kype reservoir (hydro) which lies to the east.

The well-used long distance walking route the Covenanters Trail (a RoW) runs through the proposed site, from which a spur footpath leads to the Auchingilloch monument.

Consultees Comments

Director of Physical Planning, Strathclyde Regional Council

- The only archaeological site recorded in the area is a cairn at NS 6947 3625 on the summit of Harting Rig. I note from the map that the summit area is to be left unplanted, and there is therefore no requirement to take any other positive measures to protect the cairn.

Assistant Director, Water Department, Strathclyde Regional Council

- In the first instance the Department was concerned about reduction in water yield for the Kype reservoir.
- After discussion the Department's concerns were allayed based on assurances that greater margins to water courses and additional turf planted margins would be provided. Further, additional catchment area would be gained by careful diversion of the drainage of suitable areas to discharge into the catchment area to offset anticipated loss of yield on account of the proposed afforestation.

Head of Forestry Branch, Department of Agriculture

- No comment to be made on the scheme

CASE D

Description of the Proposals
The proposals cover 43.6 ha of improved grassland in the Cumbernauld & Kilsyth District of Strathclyde. The scheme consists of the following:

New planting – conifers	38.36 ha (SS 97%, HL 3%)
New planting broadleaves	3.24 ha (GWL 20%, ROW 20%, AH 20%, WL 15%, HAW 15%, HAZ 10%)
Open ground	2.00 ha
Total	43.60 ha

Objectives
The objectives of the scheme are to create a commercial woodland, extending the existing WGS woodland south of the unclassified public road and:

- Produce wood and marketable timber
- Enhance the landscape
- Maintain and create new wildlife habitat
- Provide an alternative to agricultural production, further diversifying the farming enterprise towards a forestry estate.

Establishment Techniques
Ground preparation by mounding using the MacLarty Mounder.

All coniferous plants @ 2300/ha with broadleaves and woody shrubs at varying spacing 1.2 m – 4.0 m centres producing 1700 stems/ha on average. All broadleaves will be protected with 'Quill' protectors. Conifers to be direct planted on the mounds. Open ground centred on existing wayleaves along the boundary with the minor county road. The edges of the wayleaves will be scalloped and planted in such a way that species boundaries are not obvious. Existing thorn hedges and hedgerow trees will be retained and not underplanted.

Garbet ruin will have an area of mixed broadleaved species surrounding the building, extending the few specimens already on site. Hybrid larch in mixture with Sitka spruce will add diversity and mirror the species mixture north of the county road.

Water courses are limited to open field drains, these however will be treated as water courses as per Forestry Commission's Forest and Water Guidelines III Edition.

Attention has been given to the roadside corridor however the southern half of the scheme backs onto an existing Forest Enterprise plantation and consequently little benefit will be gained with the use of open ground or broadleaves adjacent to this area.

The area is stock fenced. An internal light rabbit fence will be erected and existing stock fences will be maintained. Subsequent weeding will comply with Forestry Commission Booklet No 8, The Use of Herbicides in the Forest. All necessary beating up, pest control and fire protection will be undertaken as required to achieve satisfactory establishment.

Description of the Site
The site is located approximately 23 km east of Cumbernauld. The main land uses in the area are stock farming with limited arable and limited commercial forestry. The site is located near the outskirts of Cumbernauld and constitutes the total area of one small-holding. The site is bounded on east, south and west sides by existing Forest Enterprise plantations. The area is recognised in the Strathclyde Region Structure Plan: Indicative Forestry Strategy as being within the potential zone for afforestation. It is also within the Central Scotland Woodlands Area where new planting is particularly welcome. The area has been identified as a site of local wildlife interest.

The site lies on low rolling countryside and is not immediately visible from any major route or town.

Until very recently the site was actively farmed. The majority of the area is improved grassland which was re-seeded within the last 20 years. There is no specific information on flora available for the site. There is a limited area of unimproved peatland with associated mire communities.

The site is known to be within the wintering grounds of the rare Bean Goose. Although the geese have not used the site in recent years, it has been used in the past. The flock use an area of some 3600 ha – the site lies at the extreme north west end of the area. This flock of geese makes up 25% of the UK population and 100% of the Scottish population. No other records of fauna are available.

Consultees Comments

Director of Physical Planning, Strathclyde Regional Council

- The proposal is within an area identified as a site of local wildlife interest.

Area Manager, Scottish Natural Heritage

- The proposal is within the range of wintering habitat used by Scotland's only flock of Bean Goose. The loss of open fields would result in a depletion of winter habitat for feeding and refuge which varies with local conditions of climate and human activity.

Chief Planning Officer, Cumbernauld & Kilsyth District Council

- In general the proposals are welcomed as they make a contribution to the landscape amenity, create new wildlife habitat and produce commercial timber.
- Planting as proposed would have nil or negligible effect on the Bean Goose population or its tenure in the area.

Acting Director, Strathclyde Water Services, Strathclyde Regional Council

- Strathclyde Water Services has no comment to make on the application.

Conservation Officer, Royal Society for the Protection of Birds

- The site lies in the wintering grounds for one of only two populations of Bean Geese in the UK – a Red data Book species. With only 145 birds in this flock and 3-400 in the other in Suffolk, this species is clearly a conservation priority in terms of its small numbers and also by being at the edge of its current range.
- The Bean Goose is fully protected under the Wildlife and Countryside Act 1981, Annex II/I of EC Birds Directive and Appendix III of the Berne Convention.
- RSPB were contracted to survey the flock in 1993/94 and 1994/95 to ascertain the distribution and habitat preferences on the flock on the Salamannan Plateau. Geese not recorded on the proposed site in the study but have been known to use the site previously.
- Several of the fields on Arns Farm previously used by the flock are now not used due to changing ground and vegetation conditions. Further reduction in suitable area through afforestation is likely to be harmful to the flock.
- The strong preference exhibited by Bean Geese for feeding on improved fields suggests that major afforestation on improved fields would not be compatible with the needs of the geese

Director of Physical Planning, Strathclyde Regional Council

- I would advise you that no features of archaeological importance appear to be affected by the afforestation proposals.

EIA SCREENING CASE STUDIES

Within this case study pack you are supplied with:

• project & site detail sheet • WGS application map • consultees comments sheet

The objective of these case studies is not to examine the competency of individual officers – if preferred, these case studies can be carried out anonymously. The aim of this work is to evaluate the current systems employed within the FC to screen projects for EIA and subsequently scope assessments.

Each case study is based on an actual WGS application with additional information on the site and comments from consultees provided to make the case study as true to life as possible. To allow interpretation of your decision process you are asked to follow a simple procedure using the matrix and tables included in this form.

You are asked to review the information presented and to screen the case for the requirement of EIA or otherwise. Depending on your decision you are then requested to list any special conditions you may attach to WGS approval if no EIA is called. If you decide an EIA is required you are asked to make an initial scoping of the assessment briefly listing the impacts you would require assessed and the type of baseline date and methods of assessment which should be employed.

All the results from the analysis of responses will be used anonymously – you are not required to give your name if you do not wish to, however to allow a comparison between the differing levels of experience to be made it would be helpful if you could give an indication of your grade and the experience you have of EIA administration.

Thank you very much for taking part in this research.

INSTRUCTIONS

1. Read through the project & site detail sheet together with the WGS form and the accompanying map. From this information you will be able to quickly obtain a brief but detailed description of the proposed afforestation proposal and a summary of the known features of the chosen site. Use the blank matrix in Section 1 to assist you to identify potentially damaging elements of the project and where potential impacts may occur.
2. Now read the accompanying consultees comments. Using the table in Section 2 identify which, if any, of the impacts you now consider to be potentially significant. List the project elements and the impacted environmental elements and describe as clearly as possible what you see is the effect of the impact. Finally give a brief explanation of your decision.
3. Record in Section 3 your decision as to whether or not you recommend that an EIA should be carried out.
4. If you consider that an EIA is not required, please list any special conditions you would attach to approving the proposal for entry into the WGS.

Name:	Grade:	Experience of EIA (circle one): 0-3 3-6 6-10 10+

Section 1 Identification of Potential Impacts

An impact can be considered to be the act of one body striking or influencing another. With this definition in mind, use the following matrix to illustrate potential impacts in the case study. Along the top axis use the blank boxes to note the elements of the project that you consider to have an impact on the environment. Indicate with a O those impacts you consider not to give cause for concern. Indicate with a ● those impacts you consider to be potentially significant. An example is provided in the first column.

Environmental Attributes	Project Activities											
	ploughing											
Geology	O											
Soils	●											
Flora	O											
Fauna												
Water	●											
Climate												
Air												
Landscape	O											
Material Assets												
Human Beings												
Cultural Heritage	●											

Section 2 The Identification of Potential Effects

The result of an impact can be considered to be the effect on the environmental element. To make sense of this during screening one must identify the potential effect and provide a reason for coming to this decision. Use the following table to identify for each impact you considered potentially significant, the effect and the basis for your decision. An example is given in the first row.

Environmental Attribute	Project Activity	Effect	Reason for Decision	Effect	Reason for Decision
Water	Ploughing	Potential change in pH	Site forms major percentage of water catchment for loch designated as SSSI due to unmodified status and low pH, with rare assemblage of pH sensitive flora and fauna.	Potential change in pH	Site forms major percentage of water catchment for loch designated as SSSI due to unmodified status and low pH, with rare assemblage of pH sensitive flora and fauna.

Section 3 Screening Decision

Please mark one of the following boxes with a ✓.
Do you consider that –

The project can proceed without an EIA	☐	GO TO SECTION 4
The project requires an EIA	☐	

Section 4 WGS Special Conditions

Please list any special conditions you would include in the WGS contract.

Screening Case Studies Results

Appendix 3.3.1

Forestry Commission Staff

Respondent	Case A			Case B			Case C			Case D		
	Y	N	IMPACTS	Y	N	IMPACTS	Y	N	IMPACTS	Y	N	IMPACTS
1		1			1		1		Flora/ground prep Soils/ground prep Water/fertiliser Cultural/planting		1	
2		1		1		flora/deer cultural/grazing change landscape/fencing	1		soils/ground prep flora/ground prep water/fertiliser landscape/ground prep	1		birds/habitat loss soils/plants
3		1		1		birds/fence landscape/fencing flora/pesticides water quality/pesticides	1		land use balance/planting water/ground prep	1		birds/habitat loss
4		1			1		1		soils/ground prep flora/ground prep water/fertiliser landscape/ground prep		1	
5		1		1		birds/regeneration cultural/grazing change access/fencing		1			1	
6		1		1		birds/fencing water quality/pesticides flora/pesticides landscape/fencing		1			1	
7		1		1		landscape/fencing cultural/grazing change	1		soils/ground prep water/ground prep		1	
Total	0	7		5	2		5	2		2	5	

Screening Case Studies Results Appendix 3.3.2

University of Wales, Bangor Students

Respondent	Case A			Case B			Case C			Case D		
	Y	N	IMPACTS	Y	N	IMPACTS	Y	N	IMPACTS	Y	N	IMPACTS
1		1		1		landscape/fencing flora/deer soils/natural regen	1		flora/planting landscape/planting water quality/planting		1	
2	1		water quality/ground prep flora/pesticides	1		flora/deer	1		flora/drainage water quality/pesticide	1		birds/habitat loss
3		1			1		1		flora/deer	1		birds/habitat loss
4		1		1		landscape/fencing cultural/grazing change flora/pesticides	1		flora/planting landscape/planting		1	
5		1		1		flora/pesticides	1		water quality/planting flora/deer	1		birds/habitat loss
6		1		1		flora/deer landscape/fencing access/fencing	1		flora/drainage flora/deer access/fencing	1		birds/habitat loss
7		1		1		flora/deer		1		1		birds/habitat loss
8		1		1		landscape/fencing flora/deer cultural/grazing change		1			1	
9		1		1		landscape/fencing cultural/grazing change flora/deer	1		flora/ground prep landscape/planting water quality/pesticide		1	
10	1		flora/ground prep		1			1		1		birds/habitat loss
11		1		1		flora/deer	1		water quality/planting access/fencing		1	
12		1			1		1		water quality/fertiliser access/fencing	1		birds/habitat loss
13		1		1		landscape/fencing *flora/deer*		1		1		birds/habitat loss
14		1		1		flora/deer cultural/grazing change water quality/fertiliser		1		1		birds/habitat loss
15		1		1		flora/deer cultural/grazing change landscape/fencing	1		flora/planting landscape/planting		1	
16		1			1		1		water quality/planting flora/deer	1		birds/habitat loss
17		1			1		1		water quality/planting	1		birds/habitat loss
18		1		1		flora/deer cultural/grazing change	1		water quality/planting	1		birds/habitat loss
19		1		1		flora/deer cultural/grazing change		1		1		birds/habitat loss
20		1		1		flora/deer cultural/grazing change		1		1		birds/habitat loss
Total	**2**	**18**		**15**	**5**		**13**	**7**		**14**	**6**	

Screening Case Studies Statistical Analysis **Appendix 3.3.3**

Test if there was a difference in the proportion of students and foresters who classified the three cases studies as requiring an EIA / not requiring an EIA. If Pearson's Chi squared < 0.05 there is a difference between the groups.

CASE A

Chi-Square	Value	DF	Significance
Pearson	0.75600	1	0.38458
Continuity Correction	0.00096	1	0.97523
Likelihood Ratio	1.25549	1	0.26251
Linear-by- Linear Association	0.72800	1	0.39353
Fisher's Exact Test:			
One-Tail			0.54131
Two-Tail			1.00000

CASE B

Chi-Square	Value	DF	Significance
Pearson	0.03444	1	0.85278
Continuity Correction	0.00000	1	1.00000
Likelihood Ratio	0.03398	1	0.85375
Linear-by-Linear Association	0.03316	1	0.85550
Fisher's Exact Test:			
One-Tail			0.60718
Two-Tail			1.00000

CASE C

Chi-Square	Value	DF	Significance
Pearson	0.09643	1	0.75616
Continuity Correction	0.00000	1	1.00000
Likelihood Ratio	0.09813	1	0.75409
Linear-by-Linear Association	0.09286	1	0.76058
Fisher's Exact Test:			
One-Tail			0.57132
Two-Tail			*1.00000*

CASE D

Chi-Square	Value	DF	Significance
Pearson	3.68620	1	0.05486
Continuity Correction	2.16992	1	0.14073
Likelihood Ratio	3.68831	1	0.05480
Linear-by-Linear Association	3.54968	1	0.05956
Fisher's Exact Test:			
One-Tail			0.07111
Two-Tail			0.08401

CONCLUSION

There is no difference between the groups in how they screened any of the four case studies as requiring EIA or not requiring EIA.

Environmental Impact Assessment Questionnaire Respondents Appendix 3.4

Number	Name	Organisation
C1	C Badenoch	Scottish Natural Heritage
C2	P Kirk	Deer Commission Scotland
C3	P Robins	West of Scotland Archaeological Service
C4	H Doherty	Scottish Natural heritage
C5	G Campbell	Scottish Environmental Protection Agency
C6	C Mathieson	Scottish Environmental Protection Agency
C7	J Warren	Scottish Natural Heritage
C8	M Elliott	Scottish Natural Heritage
C9	C Crooke	Royal Society for the Protection of Birds
C10	A Lorimer	Scottish Borders Council
C11	S Pritchard	Scottish Natural Heritage
C12	E Stewart	Scottish Office Agriculture, Environment and Fisheries Department
C13	S Benn	Royal Society for the Protection of Birds
C14	P Gordon	Royal Society for the Protection of Birds
C15	J Frame	Scottish Environmental Protection Agency
C16	R Youngson	Deer Commission Scotland
C17	C Rollie	Royal Society for the Protection of Birds
C18	I Francis	Royal Society for the Protection of Birds
P1	J Hall	Julian Hall Environmental
P2	M Mitchell	Mitchwood Forestry Services
P3	J Welstead	John Clegg & Co
P4	G Carter	UA Forestry Ltd
P5	O Russell	Ballindalloch Estate
P6	D Wathern	Torr a' Mhullaich Farm
P7	C Fulton	Tilhill Economic Forestry
P8	A Ritchie	Lonsdale Forestry Ltd
P9	R Henderson	Bidwells
P10	F Karthaus	Border Consultants
P11	E Lawrence	Lawrence Environmental Consultants
P12	A Anderson	David Goss & Associates
P13	C Langton	Atholl Estates
P14	B Dunlop	Forest Conservation Services
P15	J MacKay	Bowlts
P16	N Hackett	SWRC
P17	D Hawker	DH Ecological Consultancy
P18	S Johnston	Scottish Woodlands Ltd
P19	R Shaw	Scottish Woodlands Ltd
F1	B McDonald	Strathclyde FO II
F2	K Wishart	Strathclyde FO I
F3	N Mainprize	Perth FO III
F4	M Strachan	Perth FO III
F5	J McDougal	Perth FO III
F6	D Lindsay	Perth FO II

Forestry Commission Staff

Environmental Impact Assessment (EIA) Questionnaire

Please answer the following questions by ticking the answer which best reflects your experience of EIA. Use the additional space to add comments where necessary.

Name:	Conservancy:	Grade:

Q1	How many EIAs have you administered?		
	0-2		Comments
	3-5		
	6-9		
	10+		
Q2	Are consultees involved in the screening process?		
	Never		Comments
	Rarely		
	Frequently		
	Always		
Q3	Do you believe the current screening process accurately identifies projects with potentially significant adverse impacts?		
	Never		Comments
	Rarely		
	Frequently		
	Always		
Q4	Do you use any tools to aid screening (eg matrices, checklists)?		
	Yes		If yes, please describe them here.
	No		
Q5	Are you involved in a formal scoping process for individual EIAs?		
	Never		Comments
	Rarely		
	Frequently		
	Always		
Q6	Do you use any tools to aid scoping (eg matrices, checklists)?		
	Yes		If yes, please describe them here.
	No		
Q7	Are consultees involved in the scoping process?		
	Never		Comments
	Rarely		
	Frequently		
	Always		

Q8	Do you believe the current scoping process accurately identifies potentially significant adverse impacts?		
	Never		Comments
	Rarely		
	Frequently		
	Always		
Q9	Do you believe ESs give factual, unbiased assessment of potential impacts?		
	Never		Comments
	Rarely		
	Frequently		
	Always		
Q10	Do you believe ESs provide information that is useful in the decision making process?		
	Never		Comments
	Rarely		
	Frequently		
	Always		
Q11	How useful do you see EIA as a method of environmental protection?		
	Not at all useful		Comments
	Of limited use		
	Useful		
	Very useful		
Please use this space to comment on your overall experience of the EIA process.			

EIA – the systematic assessment of potential significant adverse impacts
ES – the report prepared as part of an EIA
Screening – the process of identifying projects with potentially significant adverse impacts
Scoping – the process of focusing attention on key issues

Environmental Impact Assessment Questionnaires — Appendix 3.5.2

Forest Sector EIA Practitioners

Please answer the following questions by ticking the answer which best reflects your experience of EIA. Use the additional space to add comments where necessary.

Name:	Organisation:	Position:

Q1	How many EIAs have you prepared?		
	0-2		Comments
	3-5		
	6-9		
	10+		
Q2	How do you regard the guidance given by the Forestry Commission on how to conduct an EIA and prepare an ES?		
	Not at all useful		Comments
	Of limited use		
	Useful		
	Very useful		
Q3	Do you consider EIA to be a useful process which can aid project planning?		
	Never		Comments
	Rarely		
	Frequently		
	Always		
Q4	Have you ever withdrawn a project due to it being called for *EIA?*		
	Yes		If yes, please give details of the reasons for withdrawing here
	No		
Q5	Do you undertake a formal scoping process for individual EIAs?		
	Never		Comments
	Rarely		
	Frequently		
	Always		
Q6	Do you use any tools to aid scoping (eg matrices, checklists)?		
	Yes		If yes, please describe them here.
	No		
Q7	Which of the following do you normally involve in the scoping process?		
	FA		Comments
	SNH		
	Local Authority		
	SEPA		
	Local groups		
	RSPB		
	SOAEFD		
	Others – specify		

Q8	How often do you use specialised consultants for predicting and assessing potential impacts?		
	Never		Comments.
	Rarely		
	Frequently		
	Always		
Q9	How would you rate your most recent ES as a mechanism for providing decision makers with specific, unbiased information on the potential adverse impacts of the project.		
	not at all useful		Please name your most recent EIA
	of limited use		Comments
	useful		
	very useful		
Q10	What is the average cost of an EIA?		
	£0-5000		Comments
	£6-10000		
	£11-20000		
	£20000+		
Q11	How useful do you see EIA as a method of environmental protection?		
	not at all useful		Comments
	of limited use		
	useful		
	very useful		
Please use this space to comment on your overall experience of the EIA process.			

EIA – the systematic assessment of potential significant adverse impacts
ES – the report prepared as part of an EIA
Scoping – the process of focusing attention on key issues

Environmental Impact Assessment Questionnaires Appendix 3.5.3

Forest Sector Consultees

Please answer the following questions by ticking the answer which best reflects your experience of EIA within the forest sector. Use the additional spaces to add comments where necessary.

Name:	Organisation:	Position:

Q1 How many EIAs have you been involved with?

Forest Sector		Other Sectors		Comments
0-2		0-2		
3-5		3-5		
6-9		6-9		
10+		10+		

Q2 How frequently does the Forestry Commission consult you on the screening of projects?

Never		Comments
Rarely		
Frequently		
Always		

Q3 How frequently are you asked to participate in a scoping exercise?

Never		Comments
Rarely		
Frequently		
Always		

Q4 Do you use any tools to aid scoping (eg matrices, checklists)?

Yes		If yes, please give details here
No		

Q5 How often are you asked to advise on the following?

Baseline data requirements		Prediction and assessment of impacts		Thresholds of concern		Methods of mitigation	
Never		Never		Never		Never	
Rarely		Rarely		Rarely		Rarely	
Frequently		Frequently		Frequently		Frequently	
Always		Always		Always		Always	

Q6 Do you consider that your concerns on specific impacts are included in assessment?

Never		Comments
Rarely		
Frequently		
Always		

Q7	Do you consider that ESs adequately assess those impacts you considered to be potentially significant?		
	Never		Comments
	Rarely		
	Frequently		
	Always		
Q8	How useful do you see EIA as an aid to decision making?		
	Not at all useful		Comments
	Of limited use		
	Useful		
	Very useful		
Q9	How useful do you see EIA as a method of environmental protection?		
	Not at all useful		Comments
	Of limited use		
	Useful		
	Very useful		
Q10	If you deal with EIAs from other sectors how do they compare with forest sector EIAs in terms of rigour of assessment?		
	Better		Comments
	About the same		
	Worse		
Please use this space to comment on your overall experience of the EIA process.			

EIA – the systematic assessment of potential significant adverse impacts
ES – the report prepared as part of an EIA
Screening – the process of identifying projects with potentially significant adverse impacts
Scoping – the process of focusing attention on key issues

APPENDIX 4

Environmental Statement Extracts Appendix 4.1.1

Beinn Leamhain

1. Non Technical Summary
1.1 Description

The owners of Ardgour Estate have submitted to the Forestry Authority an application for the Woodland Grant Scheme in respect of an area which totals 675.7 ha. The proposal is for both natural regeneration and planting of native broadleaves covering an area of 385.8 hectares, and native Scots pine covering an area of 60.2 hectares. The existing native woodlands will be protected and improved, with the remaining 201.7 hectares being retained as managed open ground.

1.2 Assessment Impact of Proposals
The proposals are unlikely to have adverse social or economic effects upon the local community, or upon agriculture nationally. There are no inhabited dwellings within the application area, and it is possible that employment will be somewhat enhanced as a result of the project. The visual impact of the proposal has been examined. It is considered that the overall development of a semi-natural woodland in the area will enhance the scenic quality of the local landscape. All the existing semi-natural woodland areas on the site are to be retained, and natural regeneration encouraged, with the effect of softening the visual impact of any new planting, all of which will be with native species. Advice has been sought from many organisations in the preparation of the Environmental Assessment, and all the Statutory Consultees have been sent a copy of the Woodland Grant Scheme application. A full list of consultees is detailed in Paragraph 2 - Introduction of the Environmental Assessment. Other sources of information have been, The Royal Society for the Protection of Birds, and the Macaulay Land Use Research Institute.

The nature conservation aspect of the scheme, will in general, improve the area by the increase in native tree species over the majority of the area. These woodlands, together with the managed open ground, will provide habitats for a wider range of birds, mammals, and invertebrate species, than are present now. Some of the existing bird species may be displaced, but overall the proposals are likely to be beneficial to most species of birds. Water courses and catchment areas within the planting area will be protected by wide buffer zones in order to reduce the impact of planting, and drains will be constructed in a manner which will avoid scouring, or cause turbidity in watercourses.

Detailed notes on the vegetation have been produced by Tilhill Economic Forestry's own ecologist, together with information provided by Scottish Natural Heritage. The Regional Archaeologist has indicated that there might be two areas which may contain archaeological interest. These will be surveyed before development, and any interests which are identified will be protected, along with the features detailed in 4.7. The proposals are not considered to have any adverse effect on the road systems of the area, or any other infrastructure in the region.

3. Description of the Proposals
It is proposed to establish forest cover over a gross area of 592.5 hectares, which represents about 3.6% of the estate area. Within this area, 35.0 hectares are classified as existing woodlands. The area for natural regeneration covers an area of 373.8 hectares, and the planting area 183.7 hectares. The open area, above the proposed planting extends to 83.2 hectares, giving the scheme total of 675.7 hectares. The following summarises the above which is detailed in the map in the appendix:

Compartment	Area (ha)	Percent of area
SM (woodland)	35.0	5
NN (woodland)	47.1	7
NN	326.7	48
NP	183.7	27
OL	83.2	13
Total	675.7	100

Where there is existing seed sources, natural regeneration will be used as the preferred method of establishment. As ground conditions over much of the area do not allow for machine access, scarification as an aid to establishment will not be possible. The use of cattle on the site, after fencing, would benefit regeneration in certain locations, as could controlled burning. In both of these operations, extreme care will be taken to ensure that they do not damage the existing resource, particularly the very fragile soils present over much of the area. Outwith the area, where natural regeneration is considered possible, (compartments PP and NP), direct planting on screefs, turves, and mechanical mounding will be used. The type of ground preparation will depend on the soils and ground conditions. The mechanical mounding will be confined to parts of compartment PP where establishment would be difficult using any other establishment technique. All ground preparation will be done in accordance with the Forest and Water Guidelines.

Cross drains will be constructed where necessary in compartment PP. These will be aligned up the glens to obtain an even gradient, and will not exceed two degrees. Drain ends will be held back from gully and stream edges. Sumps will be created at the ends of all main drains to intercept sediment and debris. Buffer zones will be left to prevent runoff drains leading directly into watercourses. The woodlands, both natural and planted, will be varied according to ground conditions, and will be laid out to echo land form. This will be achieved through varied upper planting lines, varied planting densities, species choice, and the use of open space within the planting. Caledonian pine seed will be collected from the local source, and grown on for use as planting stock to extend range. Where the pine is planted, it will be done in mixtures of other native broadleaved species to recreate the natural associations of south western woodlands containing native Scots pine. Deer control will be vigorously practiced during the establishment phase through constant monitoring, and culling where necessary. All works will be carried out in accordance with current afforestation guidelines, particularly "The Management of Broadleaves, Forest and Water Guidelines" and " Landscape Guidelines".

4. Site Description

4.1 Location and General

The application area lies to the east of the A861, some 5 km south of Corran in Argyll. It lies within an area 'sensitive' for forestry in Highland Regional Council's draft Indicative Forestry Strategy. The sensitivity of the area is in relation to the area's landscape value. Within an area with a radius of 8 km of the summit of Beinn Leamhain (201 km sq) woodlands currently represent 2.5% of the land cover. As a result of the proposed afforestation, this percentage is likely to increase to 5%. The application area is used in the estate as rough grazing for sheep and deer. The Glen Gour (Salachan) presently carries a total sheep stock of 500, together with a small herd of cattle.

4.6 History of Land Use

The application are has been used for deer forest and sheep walk for several centuries now. The woodland resource has gradually depleted through indiscriminate burning and grazing, and this has resulted in the woodlands being restricted to pockets of poorly stocked remnants. It is likely that the woodlands, and particularly the oak woodlands at Gearradh, were managed or cut for charcoal production in the past, although to date no charcoal platforms have been found.

5. Site Assessment

5.1 Agricultural Employment

Glen Gour (Salachan) is presently farmed on a share farm agreement. The area is farmed by the applicant, and one tenant. The impact of the application is likely to mean the reduction in sheep stock from 500 to 400 in the glen. It is unlikely to affect the cattle enterprise. Given the marginal level of farming on the application area, the impact on agricultural employment is likely to be minimal.

6. Assessment of Impact of Proposals

6.2 Employment

The likely impact on the agricultural enterprise is a reduction in the present sheep stock from 500 to 400 in the glen. Based on a theoretical calculation provided by an Agricultural Consultant (Watson Bell Consultants, Elgin), the likely reduction in agricultural employment would equate to 0.2 man years (see Appendix IV). In practice, the reduction in stock numbers is unlikely to change the current employment structure. To mitigate this, there will be employment created in the establishment of the proposed forest, with relatively high levels of activity in the first five years falling off through the rotation until felling is possible.

According to statistics for Scotland's forest area and employment provided in 1991-1992, it shows 10255 jobs derived from 1131000 hectares of woodland. This represents one full time job per 110 ha as an overall average, equivalent to nine jobs per 1000 ha of woodland area. This figure relates to forest jobs, and excludes employment in the timber processing industries. However, native woodlands are unlikely to produce this level of employment as the above figures are strongly biased towards the intensive management regimes, and shorter rotations of conifer crops.

Based on a theoretical calculation for a 1000 ha native woodland, the likely employment for a development of this scale over 20 years is likely to equate to approximately 50 man years (See Appendix III). Extrapolating these figures for Beinn Leamhain, it could be expected to create approximately 25 man years work in the first ten years. The majority of the work would be in the fencing, planting, and tending of these plantations. Work connected with natural regeneration would be minimal apart from manual collection and dispersal of the indigenous seed, if applied. Management and protection work would be greater during establishment, but would quickly decline after this phase. If used for educational or recreational purposes, there would be the possibility of continued employment in the form of a ranger, or similar.

7. Conclusion

The scale of the proposal has implications on employment relating to the current land use, and the wildlife which is associated with the area. It is considered that sufficient information has been presented in this statement for the consultees to reach a conclusion on the likely effects of this planting proposal.

Environmental Statement Extracts — Appendix 4.1.2

Cornharrow Partial Afforestation Scheme

2. Summary

The proposed afforestation of 357 hectares of the 483 hectares Cornharrow Farm is a diversification intended to reduce the dependency of the holding on the current regime of intensive hill sheep and cattle grazing. The forest will provide for the owner's strong interest in sporting and conservation whilst his farming interests will continue on those areas identified as having the highest botanical conservation value where forestry would be inappropriate. These areas will be grazed less intensively to enhance their conservation value in accordance with the objectives of the Western Southern Uplands Environmentally Sensitive Area.

The bulk of the planting will be with conifers proven to perform commercially on similar upland sites but with a good admixture of different conifer species, native broadleaves and open ground providing visual and textural variety to help emphasise landscape features and the underlying landform. The purpose and scoping of the Environmental Assessment for Cornharrow is explained in the introduction to this Environmental Statement. The conclusions reached form section 9 but are briefly summarised below.

The primary issues arising from the proposals are the impacts on landscape and nature conservation both locally and in the context of the wider balance of land use. Bird species dependent on open grassland will be effected adversely due to the diminution of this habitat resultant from the planting of trees. There will be a succession of woodland birds as the forest develops. Important botanical interest will be safeguarded and enhanced through the application of less intensive stock grazing. The diversified land use proposed will provide a more stable financial footing for the property, an enhanced level of rural employment, a greater spectrum of habitats and an increased potential for public recreation. The owner wishes to implement the proposal from the end of the current agricultural year (October).

5. Description of the proposals

5.1 General

Cornharrow Farm extends to 484.3 hectares of hill ground in the north east of the Stewartry District of Dumfries and Galloway Region. The area lies within the Western Southern Uplands Environmentally Sensitive Area (ESA) recently designated by SNH and administered by the SOAFD to support farming practises which have helped to create the distinctive landscape, wildlife habitats and historic features of the area. The farm extends to 483.8 hectares of which it is proposed to commit 357.6 hectares to forestry. The balance of the farm, 126.2 hectares, will be summer grazed only with hill sheep. The result of the proposal would be an integrated farm/forestry enterprise with the major emphasis on timber production as a sustainable, renewable resource. The proposal involves some 357.6 hectares (74%) of the farm. The remaining 126.2 hectares (26%) of the farm is to be managed in accordance with the objectives of the ESA.

Category	Area (ha)	% WGS area
Existing conifer woodlands	3.1	0.9
New conifer planting	269.9	75.5
New broadleaf planting	24.5	6.8
Open ground (includes components of broadleaf and treeline planting)	60.1	16.8
Total	357.6	100

5.4 Alternatives

The status quo involving the intensive rearing of sheep and cattle is wholly dependent on agricultural subsidy. It is forecast that as a result of CAP reforms, agricultural subsidies will fall in the near future undermining the economic viability of hill farming. The full time shepherd resident at Cornharrow will retire in November 1995 and proposes to move with his wife to a town in Upper Nithsdale.

5.5 Forest Establishment Works

The ground will be prepared for planting by a combination of ploughing and mounding as appropriate for the local soil conditions, the latter operation involving the inversion of individual turves as opposed to a continuous plough ribbon. A system of open drains will then be excavated where necessary. These operations will adhere to the current 'Forest and water Guidelines'. Mounding will be concentrated on the steeper, drier slopes to reduce the risk of erosion in the first few years after cultivation. Planting will be done by hand and broadleaves, which are more susceptible to browsing, will be protected by appropriate tree guards. Any failures in the first few years will be replaced to maintain adequate stocking and weed control will be exercised by hand or approved herbicide as necessary to achieve satisfactory establishment. To assist growth and rapid establishment trees will receive an application of potash (K) and/or phosphate (P) by hand in the summer after planting at rates recommended by current Forestry Commission research.

6. Site Description

6.1 Location and Land Use Context

Cornharrow Farm is situated at the head of the Straonfreggan Burn which leads into the Water of Ken in the north east of the Stewartry District of Dumfries and Galloway Region. Moniavie is approximately 11 km (7 miles) to the east and Carsphairn is approximately 10 km (6 miles) to the west. Cornharrow is bordered by the recently afforested properties of Carroch Hill to the south and Manquhill to the north west. Benbuie forest lies adjacent to the north east boundary whilst to the east is Craiglirian hill farm.

The property lies within the Western Southern Upland Environmentally Sensitive Area and I a 'Potential Area' for forestry as identified in Dumfries and Galloway Regional Council's draft Indicative forestry Strategy document. The property does not lie within a Specially Identified Area of Hill Sheep farming, a National Scenic Area or Area of Regional Scenic Significance, a Sensitive or Potential Area for Nature Conservation an Archaeologically Sensitive Area, a Public Water Supply Catchment, or an Area Sensitive to Surface Water Acidification as identified in the various 'sieve' maps used to determine suitability for forestry in the draft IFS. In the context of water quality, it does not lie adjacent to an Area of Sensitive Geology and within an Area where Critical Loads for Acidity are Exceeded for Soils. Some 70% of the forests in Dumfries and Galloway have been planted since 1960. Many of these forests have now reached harvesting age and are being progressively felled and restructured. As an inevitable consequence these plantations will evolve over the next twenty years or more into woodlands of diverse age and species composition providing a spectrum of wildlife habitats from areas of cleared ground to stands of mature trees as well as providing regular timber production and employment. Within a 10 km radius of Cornharrow the proportion of farmland to forestry is approximately 67% to 33%. This compares with an average tree cover of 25% of Dumfries and Galloway as a whole. Some 73.5% of Dumfries and Galloway is currently agricultural land with a further 1.5% land cover attributable to built up areas and inland water bodies. Historically, as a result of agricultural policy most new forests were developed on hill, sheep land in the Region.

Cornharrow is currently intensively grazed by hill sheep and cattle. Four small conifer woods, approximately 35 years old, are strategically placed to provide shelter for stock. The access road through Carroch and Cornharrow to Manquhill forms part of a circular footpath tying into the Southern Upland Way long distance footpath which was created as a consequence of recent forestry development on these adjoining properties. Much of Cornharrow is visible from vantage points on or close to the Southern Upland Way.

6.5 Topography and Aspect

The area comprises the west facing slope of Greengair, Cornharrow hill, Mid hill, Glenjaan Craig and Corlae hill. The slopes are concave in general form being steeper towards the summit of the hills and progressively more gentle towards the bottom. The steepest ground appears on the upper reaches of Glenjaan Craig, while sections of gentle and even ground include the lower slopes of the Cornharrow Shoulder. Southern and western aspects predominate.

6.10 Landscape and Historical Land Use

The landscape in the area around Cornharrow is characterised by upland moorland and grassland on rounded hills generally between 400 metres and 500 metres high. This scene is dominated by higher

features such as the Cairnsmore of Carsphairn group of hills rising to 797 metres some 9 km to the north west an the Rhinns of Kells which aspire to 814 metres some 18 km to the south west. Many of these hills have been partly afforested in the past 25 years, although hill sheep farming continues to be the predominant land use. The area has numerous historical and archaeological sites dating from early pre-history through to farming systems from the last century. These man-made features combine with land-form and upland vegetation to create a landscape of natural heritage interest. Primarily because of these attributes a large area of Dumfries and Galloway's uplands were recently designated as an Environmentally Sensitive Area. The landform features of Cornharrow are typical examples of glacial erosion and deposition with smooth and rounded hill crests and hummocky terrain in valley floors. The dominant feature of the area is the Cornharrow Shoulder which bisects the property in a north east to south west direction. A detailed assessment of the landscape forms Appendix 3.

7. Site Assessment

7.1 People

Currently one person is employed full time on Cornharrow farm and resides on the property with his wife.

7.6 Landscape

The status of the landscape of the general area of the Western Southern Uplands which is now designated as an Environmentally Sensitive Area is described in section 6.10 of this report and also section 1 of the Landscape Assessment which forms Appendix 3. Cornharrow is not singularly important in the local landscape and for the majority of people who might see it when travelling along the B729, affords only fleeting, distant and much foreshortened views. It is visible however from vantage points on or close to the Southern Upland Way used by between 500 and 1000 walkers each year as estimated by Dumfries and Galloway Regional Council's Ranger Service and a lesser number who currently use the circular route which runs through the western most point of the property for a short distance.

8. Significant Effects of the Proposal

8.1 People

The result of the proposals in terms of rural employment within the property gate is predicted to be an approximate two-fold increase to 2.2 jobs from the one full-time employee the property currently supports. With an assumed average rotation length (length of time from planting to felling) of 35 years for the first conifer crop at Cornharrow (ranging from 30 to 40 years in practise) the following table summarises the expected employment resulting from the proposal.

Afforested Area	Man years employed
Years 1-5	6.71
Years 6-10	0.76
Years 11-15	2.50
Years 16-20	12.51
Years 21-25	11.07
Years 26-30	1.30
Years 31-35*	14.37
Years 36-40	14.37
Total	63.59

Year 30 which marks the start of clear felling is also the year that restocking of felled areas would commence and therefore within the 40 year period which encompasses the whole felling of the first crop, there is an overlap with work relating to the second crop. The average annual employment for the first rotation is calculated thus:

63.59 man years ÷ 35 years	1.82 men/year
In addition to the above the employment generated by the residual farming enterprise at Cornharrow is calculated as	0.20 men/year
Expected average annual employment at Cornharrow as a result of the proposal	2.02 men/year

Afforestation proposals by their nature have varying employment requirements throughout the crop rotation (the length of time between planting and harvesting). The requirement is relatively high in the first five year period which represents the 'establishment' phase. This is followed by a quiescent period of growth before thinning begins around year 18. Thinning will normally continue at regular intervals until harvesting and replanting begins around year 30 (or earlier) in the very fast growing crops which can be grown in the extremely favourable climate that makes south west Scotland so suitable for forestry. The forest area at Cornharrow will be managed to provide a sustained yield of timber thereby maintaining, in conjunction with other forests in the area stable employment in a sustainable rural industry.

8.8 Landscape

The forest has been designed to accentuate the natural features of the site and present a visually diverse forest view particularly to walkers on the Southern Upland Way who are estimated to total between 500 and 1000 each year. This diversity will be enhanced in the longer term when progressive felling and replanting introduces structural variation in the forest. When viewed from vantage points on the Southern Upland way the proposals will result in a diminution of the proportion of open ground in that view although the areas of retained agricultural land where heather is to be regenerated will provide important visual contrast locally. All dykes and stells which are the most obvious of the features of the property reflecting its farming heritage will be safeguarding the development of the area proposed for afforestation. The majority of these features will remain visible after the forest has developed as will archaeological sites identified for protection access to which will be created. The regeneration of heather, the maintenance of functional dykes and the safeguarding of sites of archaeological interest are all objectives of the ESA which will be met by the proposal. The new forest will not be highly visible from the public road, the major views being afforded only from the Southern Upland Way. The impact on the balance of land use resulting from these proposals would involve the creation of a further 1.1% forest cover in the area within 10 km radius of Cornharrow resulting in a situation where the ratio of hill sheep grazing to forest cover is estimated at 67% to 33%.

Importantly in terms of landscape and environmental impact it is a fact that within the next 20 years major restructuring will inevitably occur in all forest approaching maturity in the locality and throughout Dumfries and Galloway and the country as a whole as described earlier. These forests will shake off the 'blanket' appearance created in their first rotation and will assume a structural and visual diversity through thoughtful felling, redesigning and replanting incorporating different conifer species, open ground and broadleaves. With an average of up to 20% open ground, 5 to 10% long-retention broadleaf cover and between 25% and 30% of the forest age structure between the ages of 0 and 10 years at any one time (i.e. before canopy closure stage) in future, Dumfries and Galloway's forests can be expected to settle more comfortably into the landscape and to provide much more in terms of variety and stability of wildlife habitats as time progresses and the opportunities to make changes arise. A detailed analysis of the landscape design proposals insofar as Cornharrow is concerned form Appendix 3.

9. Conclusion

Landscape and conservation embrace the more significant effects of the proposal. These headings require consideration of the impact of the proposal in the context of the current balance of land use in the vicinity of Cornharrow and Dumfries and Galloway as a whole. The implementation of this proposal will address two of the government's stated land use objectives namely; the increase in the area of commercial forestry and the reduction of agricultural surpluses in Britain. Whilst these objectives may appear to conflict in certain upland sites with the EEC Directive on the Conservation of Wild Birds (79/409/EEC) which obliges member states to prevent damage to or deterioration of the habitats of Annex 1 listed species outwith areas specifically identified for their protection, the impact of this proposal in the context of the Directive is thought to be insignificant. The botanical interest identified will be safeguarded as this predominantly coincides with areas to be maintained as hill sheep grazing where the regeneration of heather will be a management objective. The forest would be highly visible to walkers from vantage points on or near the Southern Upland Way and has been designed to reflect the landform of the property and tie in with adjacent forest areas. The proposals will result in an integrated farm/forestry estate presenting a predominantly coniferous woodland landscape but incorporating a broader spectrum of habitats than currently exists. The diversified land use proposed will provide a higher level of employment and, it is perceived, greater financial stability for the property in the future. The potential for public recreation will be increased.

Appendix 2 WGS Application

General Work Proposals

- Area ring fenced and internal fences maintained
- Ground preparation will involve combination of double mould-board ploughing and mounding as soil conditions dictate
- Planting will be done manually at a rate of 2500 conifers and 1100 broadleaves per hectare
- Cross-drainage as necessary to follow ground preparation
- Hand application of fertiliser will be made to all conifers in the summer of the year following planting
- Trees will be weeded by hand or using approved herbicides as necessary and all failures replaced to maintain an acceptable stocking
- Broadleaves protected by guards
- Damaging fauna will be controlled by a professional Wildlife Manager and all operations controlled by professional foresters
- The existing conifer blocks will not be felled until the forest road system is installed c year 15

Appendix 3 Landscape Assessment

1. Introduction

Cornharrow lies within the Western Southern Uplands Environmentally Sensitive Area which recognises the combination of landform, upland vegetation and man-made features resulting from the farming of the area for many centuries as having created a landscape of natural heritage interest. The proposed change of land use over the greater part of the farm may obscure most of the man-made features on the site but presents an opportunity to create a forest landscape which can do much to enhance the visual and textural interest of the landform through the appropriate application of different tree species and open space at varying densities. Whilst only presenting brief, distant and much foreshortened views to the traveller using the B729 public road to the south of the property, Cornharrow is highly visible from vantage points on or close to the Southern Upland Way as it crosses the high ground on the adjacent Manquhill forest.

2. Location and Description

Cornharrow lies approximately 7 miles west of Moniaive and 6 miles east of Carsphairn in an area where forestry comprises approximately one third of the land cover, the balance being intensively grazed hill sheep and cattle land. The landform features of Cornharrow are typical examples of glacial erosion and deposition with smooth and rounded hill crests and hummocky terrain in valley floors. The dominant feature of the property is Cornharrow Shoulder which bisects the property in a north east to south west direction. Other important features are:

- The smooth rounded hill tops of Greengair, Mid Hill, Cornharrow Hill, Corlae and Glenjaan Craig
- The concave slope to the north, with rock outcrops at approximately 300 metres elevation
- The flat valley floor adjacent to the Stroanfreggan Burn
- The stream and main watercourses, which generally drain in a westerly direction.

Other less important features of the landscape are the man-made ones such as the powerline, field enclosures and the four conifer shelterbelts. The adjoining Benbuie Forest to the north is very conspicuous with its straight edges which do not conform to the landscape. Similarly the rectangular shaped conifer shelterbelts, which are very conspicuous, are out of scale and do not form unity with the existing landscape. The variations in topography and soil types are reflected by the varying colours of vegetation types, eg the purple colour of the heather on the flat area adjacent to the Stroanfreggan Burn.

3. Design Principles

The planting design is based fundamentally on an analysis of the landform. This involves interpreting the area, both in plan and elevation, to determine where the visual lines of force occur. These are represented in the appended plans and elevations by arrows suggesting which way the eye is drawn when viewing the area. In general terms the eye is drawn up concave slopes and down

convex slopes. The relative strength of the lines of force are represented by the size and width of the arrows- red representing downward force, and green upward. Open ground and the different colour, texture and shape of various species of broadleaf and conifer trees have been used to accentuate these lines of force in the design plan. Map A analyses the lines of force within the property highlighting the important features listed above.

4. Important Viewpoints

Viewpoints have been selected to show those views most likely to have an impact on the car tourer using the B729 county road and the hill walkers using the Southern Upland Way footpath. The most prominent views of Cornharrow are from the Southern Upland Way footpath which traverses Stroanpatrick Farm and Manquhill Forest to the West. Within Manquhill Forest the footpath traverses Manquhill Hill and Benbrack Hill where views of the surrounding landscapes have been maintained with unplanted open ground, the most spectacular of which are the views north westwards to the Cairnsmore of Carsphairn range of hills and south westward to the Rhinns of Kells. Despite what is illustrated on the Ordnance Survey 1:50000 scale map (sheet 77) the Southern Upland Way actually follows a route some way to the west of the summits of Manquhill and Craigencarse which requires walkers to deviate from the path for distances of 120 metres and 75 metres respectively to obtain the views illustrated from these vantage points. The Southern Upland Way follows the south western slopes of Benbrack Hill to its summit from where views of Cornharrow are restricted to the tree line and hill tops.

5. Factors Affecting the Landscape Design

Archaeological Sites – archaeological features which require safeguarding by the creation of open ground around them are still to be confirmed by the Regional Archaeologist or Historic Scotland. However, it is anticipated these will not occur at such frequency or scale that their protection should have a major impact on the forest design.

Watercourses – although watercourses on the property are generally minor they have been identified for special attention in the landscape design. When not running through open ground, watercourses will be set in corridors of low density native broadleaf planting comprising 50% broadleaf cover and 50% open ground. The application of broadleaf species will follow the NVC guidelines for woodland soil types. These 'conservation corridors' will vary in width in accordance with landform from a minimum of 20 metres and will feature irregular group planting of relatively low stature broadleaves such as birch, gean, rowan and alder.

Overhead powerlines – a low voltage electricity powerline runs directly from Cornharrow Farm through the application area and onto Manquhill Estate. This requires careful treatment as no tree planting is permitted under the powerline. To avoid the corridor effect of an unplanted wayleave, shrub species will be planted at regular intervals along its length using appropriate species to interrupt any long view.

Access road – the existing access road forms part of a circular walk incorporating Manquhill and Carroch forests with part of the Southern Upland Way. A variety of tree species and open ground have been incorporated into the design proposals to create variety and diversity along this track. The proposed forest road system illustrated in the WGS species map, which will be required to service the forest, follows the contour of the slope and is positioned to optimise future harvesting operations. This road will be constructed approximately 15 years after planting to service thinning operations. The width of unplanted rides to accommodate the future road system will vary from 20 metres to 40 metres and will average 30 metres with a scalloped forest edge to reduce any corridor effect.

Special habitats – the areas of botanical interest coincide primarily with the areas to remain in agriculture. Those which occur within the WGS area are accommodated in targeted open space.

Existing woodland – there are four rectangular shaped conifer shelterbelts which will have to be retained as there is no forest road system in place to harvest them. These areas will be harvested approximately 15 years after planting when the forest road system is constructed, at which time the

surrounding forest will mask their removal. Thereafter the resulting open spaces may function as deer control areas until the second rotation when they will be replanted. The recently planted Carroch Forest to the south and the semi-mature Benbuie Forest to the north form straight edge boundaries with Cornharrow Farm. The treeline on Carroch Hill finishes at approximately 400 metres elevation. Within the landscape design proposals the treeline on Cornharrow will link in with the treeline on Carroch Hill. The treeline on Benbuie Forest finishes above the economic planting limit. The proposals for the treeline on Cornharrow link in with a ride in Benbuie Forest, which is at approximately 470 metres elevation and occurs on the horizon below the summit of Corlae Hill.

6. Treatment of Margins

The most conspicuous margin to be considered is the treeline or upper planting limit on the hill slopes. The 400 metres elevation is considered to approximate with the economic planting limit. Therefore conifers will be planted at a stocking rate of 2500 trees per hectare up to a line designated to reflect landform forces some 20 metres of elevation below the ultimate treeline and varying around the 400 metres contour. It is desirable, though expensive, in afforestation schemes to imitate as natural a forest edge as possible. In the upper margin of Cornharrow this effort has been made by pushing the planting above an elevation where trees can be expected to produce merchantable timber to ensure a natural tailing off of height and vigour. Above a line varying with landform around an elevation of just over 400 metres an area on average for another 20 metres elevation will be used to 'feather out' tree densities from 2500/hectare to nil at the ultimate 'treeline'. An area around the burn on the northern march with the Forestry Commission's Benbuie Forest is to be left unplanted mainly to protect botanical interest. This will maintain a straight forest edge along part of this boundary until this problem can be addressed when that section of Benbuie is restructured. The lower margins, which are less prominent, are seen in closer view therefore small scale variation is important. Areas of broadleave planting, open ground, and scalloping of the forest edge along the lower margins will create variation and avoid straight, hard edges.

7. Application of Tree Species and Open Ground

Map 2, illustrates the application of conifers, broadleaves and open ground in the forest design. The species proposed and area statement for the WGS area of Cornharrow is as follows:

Category		**Area (ha)**	**%**
A	Sitka spruce (including treeline open ground)	167.7	34.7
B	Sitka spruce/ Hybrid larch(3:1) (including treeline open ground)	74.6	15.4
C	Existing woodland	3.1	0.6
D	Mixed conifers	38.3	7.9
E	Mixed broadleaves/Open ground	48.9	10.1
F	Roads and rides	15.2	3.1
G	Powerline	1.3	0.3
H	Open ground	8.5	1.8
X	Agricultural land	126.2	26.1
Total		483.8	100

Predominantly the mixed broadleaves will be planted in groups at low densities (1100/hectare) in conservation corridors following watercourses throughout the property. The distribution of broadleaf planting and open space in these corridors will be on a 50:50 basis. Groups of broadleaves will be planted along the existing access track and powerline to create variety and interest. The mixed broadleaves will be native species and comprise the following:

Broadleaved species	**% composition**
Common alder	20
Silver birch	20
Willow	5
Rowan	15
Wild cherry	10
Hazel	5

Ash	10
Sessile oak	10
Woody shrubs	5
Total	100

The alder and willow will be planted on the wetter areas while oak and ash will be planted on the drier, sheltered areas at lower elevations. Rowan, cherry and birch are more hardy and will be planted at higher elevations where conditions will be more exposed. Woody shrubs comprising Aspen, Bird cherry and thorns will be planted in mixture along the powerline and access track to create variety. The field enclosures above the farm have been improved in the past as indicated by the richer grassland vegetation type. The better soils in this part of the property and its proximity to the farmhouse advocate the application of a variety of conifer species. These will be applied in varying sized groups of single species inter-phasing with intimate mixtures of a number of species to create a particularly interesting aspect in the area which will be viewed in close quarters by walkers passing through the property.

Composition of mixed conifer area	**% composition**
Hybrid larch	30
Scots pine	30
Norway spruce	30
Douglas fir, Noble fir, Silver fir, Lodgepole pine	10
Total	100

In general the Norway spruce will be concentrated on the wetter areas while the Hybrid larch and Scots pine will be aggregated towards the drier areas. The other conifer species have been included to add diversity. The prominent features on the property are the hill tops and Cornharrrow Shoulder. The treeline, which will be a wide, feathered edge of low density planting, has been positioned to accentuate the hill tops. To emphasise the strong lines of force pushing off Cornharrow Shoulder, larch will be used in mixture with the Sitka spruce at an average but varying ratio of 1:3 over a large part of this feature to reflect its form. The overall planting design proposals aim to create a varied forest comprising predominantly conifer species which will enhance the local landscape providing attractive views from the Southern Upland Way and the B729 county road. The broadleaf corridors following watercourses coupled with other features such as roads and open spaces provide a perennial framework or skeleton to the forest within which future felling patterns can be sensitively applied.

8. Future Appearance

Generally, and in economic terms, the average rotation length (time from planting to felling) will vary between 30 and 40 years. By virtue of local variation in the rates of growth throughout the property the trees will reach financial maturity at different times. As a result felling and replanting is likely to take place over a period of 15 to 20 years thereby creating additional variation in the ages, height, colours and textures of the forest in future rotations. Over several conifer rotations the broadleaves occurring along watercourses and elsewhere are expected to regenerate themselves and extend their influence throughout the whole forest through the incorporation of sporadically occurring natural regeneration into subsequent conifer crops. Through a process of carefully phased felling and replanting the forest will be managed to attain a state of equilibrium whereby the production of timber and forest products, employment and the various habitats provided by trees of different ages are sustained in perpetuity.

Appendix 8 Future Employment Calculations

The employment requirements for the proposal have worked up from principles using the writer's experience of outputs for various operations. The quantity of work required in each of the 40 years expected to encompass the harvesting of the whole of the conifer crop has been stated against each operation and an expected output per man day used to calculate total man days.

As the first five years of development work involved a declining programme of works the detail for each of the three years has been stated. After year five the work requirement is more consistent and can therefore be calculated readily for each subsequent five-year period.

The fundamental assumption in translating employment figures from man days to man years is that a man year comprises 46 weeks when 5 days are worked ie. 230 working days per man year.

Other specific assumptions appear as a footnote following the calculations.

With felling commencing at year 30 and finishing at 40 years the average rotation length is actually 35 years. For the 10 years of felling there will in fact be 10 years of replanting involving employment figures similar to the first 10 years after initial planting.

To isolate a single crop rotation or cycle and the employment involved restocking figures have not been included in the last 10 years of the above figures.

It is correct, however, to calculate the average employment in any crop by dividing the total man years employed over the 40 years required to encompass all clearfelling by the average rotation length of 35 years. The average employment expected to arise from the proposals is therefore 63.59 ÷ 35 = 1.82 men/year.

Notes

1. Clearfelling – this assumes a fully mechanised harvesting operation involving one harvester and one forwarder producing $50m^3$ of timber per day. Timber hauliers do not feature in the employment figures assumed in thinning and clearfelling operations.

2. Wildlife Management – deer control effort will increase when thinning commences due to the risk of damage to trees by Red deer (and possibly Sika deer). Further control measures will be required after felling to protect restocked areas.

In addition to the employment arising from the afforested area of Cornharrow there will continue to be employment derived from the residual agricultural areas of the farm. A simplistic calculation of this is as follows:

Current agricultural area of 484 hectares employs	= 1.00
Future agricultural area of 126 ha should employ 1 x (126 ÷ 484)	= 0.26
As summer grazing only will be practised assume only 50% above	= 0.13

In practise there will not be a pro-rata reduction in the agricultural employment due to reduced economies of scale and it could be assumed that the equivalent of 0.2 man years employment will be required to service the residual farming enterprise.

Environmental Statement Extracts — Appendix 4.1.3

Forest Farms Estate

1. Introduction

The Forest Farm Estate was offered for sale on the open market and was acquired by the Forest Farm Partnership in September 1989. The intention of the new proprietors is to develop the Estate by creating a fresh balance of land use. The proposal is to change the principal emphasis from sheep farming to forestry by establishing a forest of some 2,183 hectares. Notwithstanding this the proposal envisages that the more fertile low lying land and a complementary area of hill ground should be excluded from the area of proposed afforestation and be reserved and utilised as a viable sheep farming unit. The other assets of the forest Farm Estate such as the salmon and sea trout fishings on the River Blackwater, the trout fishings in the hill lochs and deer stalking will, in all probability, be let together with the Old Croick Manse. Whilst the deer stalking will continue, in the initial years of the project the deer population will be kept strictly under control to minimise damage to the young tree crop. Hitherto, the Forest Farm Estate has, in the past, been utilised principally as a sheep farm, although advantage has been taken of the sportings. The extent of woodland on the property is extremely limited and restricted to relics which extend to no more than perhaps about 35 hectares. An essential part of the afforestation proposals is the intention to avoid the creation of a purely commercial coniferous forest. The proposals envisage the establishment of a new Native Pinewood forest of indigenous coniferous and broadleaved species. The more open canopy of this type of forest and the diversity afforded by design and species mix will offer shelter and cover to a wider range of wildlife than exist at present. Once the forest is established it is considered that the increased diversity in landscape and land use will greatly enhance the amenity, conservation and economic viability of the Estate. Thus, the proposal envisages the development of a multiple land use policy embracing forestry, agriculture, recreation, amenity and conservation. Given the scale of the afforestation proposals, it is anticipated that the development will have an impact on the environment. The preparation of this Environmental Statement was therefore requested by the Forestry Commission under the terms of the European Community Directive (No 85/337) and The Environmental Assessment (Afforestation) Regulations 1988 (SI 1988/1207). The objective of this Statement is to draw together an analysis and assessment of the likely environmental effects of the afforestation proposals in such a way as to allow consideration of these effects and the scope for modifying or mitigating them.

2. Specified Information

2.1 Description of the Project Site

2.1.1 Area and Location

The Forest Farm Estate extends to some 4,000 hectares. This project envisages establishing a woodland over approximately 2,183 hectares leaving some 1,817 hectares of the Forest Farm Estate outwith the project site. A location map is attached and forms Appendix 1 of this report.

2.1.3 Land Form

The Forest Farm Estate comprises most of Strath Cuileannach together with the land rising on either side of the Strath, approximately to the watershed. In the valley bottom runs the upland River Blackwater which meanders lazily for long stretches, although it runs quickly adjacent to Croick where there is a waterfall and a gorge. The meanders persist over a distance rarely found in Scotland and this feature is of geological interest. The land adjacent to the river is generally flat, often wet and prone to flooding. On either side of the valley, the slopes are generally gentle to moderate although strong in places. Parts of these hillsides could be described as non-rocky but there are areas which range from slightly to very rocky.

2.1.4 Aspect

The south facing slope of the valley is generally the warmer face, having a south westerly aspect whereas the northern facing slope is cooler having a north easterly aspect. However, whilst the southern side of the Estate is somewhat sheltered, the northern face is more exposed to the prevailing south-westerly winds.

2.1.8 Landscape

Strath Cuileannach is an attractive highland glen, although not noted as a statutory area of scenic beauty. The combination of the river with waterfall, low lying green pastures, rough/improved grazing above leading up to the heathery hills with their variety of shapes, slopes, rockiness, corries and height all provided a rich diversity. The colours of the glen vary with the seasons. The purple heather dominating the higher slopes in July/august and the brown bracken dominating in the autumn. An access track runs along the length of the Strath and most people would view the vista from this route. Although the majority of the visitors to the Forest Farm Estate do not venture west of the Croick Church, if they did they would encounter the commercial coniferous blocks situated at the centre of the Strath which do not form part of the Forest Farm holding. These blocks are somewhat unattractive and obtrusive.

2.2 Description of the Afforestation Project

2.2.1 Objectives

The objectives of this project could be summarized as follows:-

- The extension of the Amat pinewood and creation of a new Native Pinewood.
- The creation, maintenance and enhancement of the native pinewood ecosystem.
- The creation, maintenance and enhancement of the native pinewood's aesthetic value.
- The maintenance of the genetic integrity of the native pipe population.
- Production of a utilizable crop of both coniferous and broadleaved timber.
- The provision of employment in a rural area.
- The provision of an alternative land use to agricultural production.
- The provision of shelter for agricultural livestock.
- The enhancement of the landscape.
- The creation of new wildlife habitats.
- The provision for recreational use.
- The provision for sporting use.
- The conservation, protection and regeneration of existing woodlands.

2.2.2 Landscape Plan

In preparing the proposals, a detailed field survey of the afforestation sites have been undertaken. Following this survey, a landscape plan showing the proposed species distribution and fencing detail has been prepared. For ease of management, the overall afforestation proposals have been divided into nine Woodland Grant Schemes and the boundaries of each individual scheme are shown on the above plan. A copy of this plan is attached hereto.

2.2.3 Forest Design

In incorporating boundaries and areas to be left uncultivated and unplanted into the overall design of the various schemes, maximum use has been made of existing topographical features. The upper boundaries of the forest have been designed to enhance the visual appearance from the Estate road and any planting adjacent to fences will be "feathered" to give a more natural fringe line. Every opportunity has been taken to utilize potential for natural regeneration of the existing long established woodlands. Notwithstanding this, ground preparation will cover only approximately 50%-60% of the cultivatable ground and the remaining bare land will not normally be planted. The direction of the ploughing/scarifying will change at least every 300 metres, where the slope allows to provide an element of diversity. Species choice has specifically been kept to native species only and where possible due regard has been taken of the existing land form and pattern of ground vegetation in determining the best locations for mixture changes and boundaries. Plant spacing will be varied to provide a more diverse woodland canopy. Drainage will be kept to the absolute minimum required. The intention is that the above design consideration will result in a landscape which has a "natural" appearance. Photographs have been taken from various points on Strath Cuileannach and overlays have been prepared to show the landscape implications of the proposed schemes. These photographs and overlays form appendix VIII of this assessment. These overlays show not only how the forest might look once established but also the visual force lines of the landscape which have had to be analysed in order to produce the forest design. It should be noted that it is not the intention to construct any new roads in association with the proposed afforestation schemes until such time as roads are required for thinning operations in some thirty years time.

2.2.6 Proposed Natural Regeneration – Schemes 1 (pt), 4 and 7 (pt)
c) Ground Preparation

No ground preparation is proposed. However, it may be necessary for a balance to be struck between disturbance of the ground and the need to create seed bed conditions without which regeneration has been demonstrated to fail. In the event scarifying would be the preferred option and this would only take place on sites of the greatest suitability for seed germination so as to give a patch effect thus providing a more diverse woodland habitat.

d) Protection

Any weeds including bracken, which prove to be troublesome will be dealt with by approved chemical or manual means in order to achieve successful establishment of the timber crop.

2.2.7 Proposed New Native Pinewood – Schemes 1 to 3 (pts) and 5 to 9 (pts)
a) Ground Preparation

The preferred method of ground preparation where site conditions allow will be scarification at 2 metre centres. Where it is seen to be essential to achieve successful establishment, ploughing using a shallow double mouldboard plough will be used, the distance between the furrows to be approximately 2 metres to give an overall 2 metre x 2 metre regime. In practice this will mean that the mineral soils and the steeper ground will be scarified with the peatier soils on flatter ground being ploughed. Where ploughing is carried out, plough furrows will change direction after a maximum run of 300 metres, where ground conditions allow, to minimize visual impact. Ploughing or scarifying will not be continuous or cover the total area of the site. The proposal envisages the ground being scarified or ploughed in a manner provided for under the Forestry Commission's Native Pinewood Scheme, thus ensuring that wet flushes, bogs, hags and rocky outcrops, etc, which are important components of any native pinewood ecosystem are left intact. No drainage will be carried out. Irregular rides for management purposes and long-term deer management will be incorporated between species, cultivation type and directional changes in ploughing/scarifying.

b) Seed

All pine seed will be collected from registered seed sources within the North and North central Zone as provided for the Forestry Commission's publication titled "Native Pinewoods – Grants and Guidelines". It is anticipated that the Amat, Strathvaich, Strathfarrar and Glen Affric stands will be the seed sources used for the native pine. All broadleaved seed used will be of Scottish origin and where possible will be of a local source

c) Plants and Planting

The project envisages that all the plants will be containerised in "root trainers". Plants will be 15-30 cm high and planted varying distances apart on ploughing/scarifying to achieve an overall stocking level of 1,100 plants per hectare as provided for in the Forestry Commission's Native Pinewood Scheme guidelines. Plants will either be notched into scarified areas. "V" notched or a "plug" removed on ploughed areas and screefed/notched on uncultivated areas such as riparian zones. Planting will be carried out by experienced staff trained in this method of planting and it is envisaged that the planting will take up to twelve months to complete. On the margins of each block, planting will be feathered and scalloped to avoid any "hard" edges and provide for a natural appearance.

2.2.8 Additional Design Considerations

a) Landscape

In the preparation of the design details for this project, one of the main considerations has been the enhancement of the landscape. This has involved the use of natural features such as gulleys, knolls and crags and the avoidance where possible of geometric shapes and straight lines.

3. Impact Assessment Data

3.2 Countryside Commission for Scotland

The Commission confirmed that the Forest Farm Estate lies outwith any National Scenic Area. Notwithstanding this, the Commission requested that a sensitive approach to forest design be taken. The

Commission expressed a desire that any alleged rights of way be respected and further suggested that the opportunity be taken to diffuse the visual prominence of existing conifers blocks in Strath Cuileannach. Whilst encouraging planting of native broadleaves, the Countryside Commission also welcomed the native pinewood proposals. The Commission also suggested that archaeological and local interests be accommodated.

4. Potentially Significant Environmental Impacts

4.8 Landscape

In the short term, the delivery/storage of materials will have a minor effect on the landscape. The ground preparation operation may also have some adverse affects in the shorter term but experience has shown that as the ground vegetation recovers, any such adverse affect will be mitigated. Currently there are a number of fences at Croick associated with the sheep farming operation. Although it is unlikely that any new fencing erected will have any greater impact on the landscape than the existing fences, there is a danger that it could have an adverse effect and this must obviously be considered. However, although it will not be immediately apparent following establishment, the most significant effect on the landscape in the longer term will be the growth of the woodland. This impact will be positively beneficial in the longer term. Given the above potentially adverse impacts on the landscape of the ground preparation, delivery/storage of materials and erection of new fencing, it is suggested that action should be taken to limit any such adverse impact.

5. Measures to Avoid, Reduce or Remedy Significant Adverse Impacts

5.6 Landscape

The potential adverse impact of the ground preparations and fencing has been noted as has the shorter but more immediate impact of delivery/storage of materials required during the establishment phase. Ploughing, scarifying, drainage and fencing could all have an adverse impact which has to be considered.

Action Required

1: Keep ground preparation activities to a minimum.
2: Keep drainage to a minimum.
3: Choose fence lines so that any new fences erected are as unobtrusive as possible.
4: Change direction of plough furrows at a maximum run of 300 metres where ground conditions permit.
5: Planting adjacent to fences should be "feathered" to give a more natural line.
6: Vary plant spacing.
7: Have due regard for the existing land form and pattern of ground vegetation in determining the best location for mixture changes and any boundaries. Use natural contours for changes in species mixtures, fence lines, etc.

RESULT: Whilst there can be no doubt that the proposed afforestation schemes will have an impact on the environment and in some cases a short term adverse impact, having incorporated all the above required actions into the schemes it is suggested that any adverse affects will be reduced if not avoided. Further it is considered that the longer term enhancement of the landscape will by far outweigh any short term problems.

6. Summary

6.1. Human Beings

Disturbance is seen as the major impact of the proposals on people but it is assessed that this will be only a short term effect and of a minor nature.

6.6. Landscape

The short term implications on the landscape of the establishment operations are highlighted. However, it is concluded that the longer term enhancement of the landscape will by far outweigh any short term adverse impacts.

Environmental Statement Extracts — Appendix 4.1.4

Hill of Foudland NNP

Summary

The proposed Woodland grant Scheme at Foudland extends to 352 hectares in total. The owner wishes to establish a Caledonian pinewood over 280 hectares, incorporating a sensitive mixture of native pines of Deeside origin native broadleaved tree species, and planned open space within the woodland area. 72 hectares of land, principally over the upper reaches of Foudland Hill, plus the disused quarries, will remain unplanted. The principal objective of the proposal is to create a sizable native woodland environment as a pleasing contrast in an area dominated visually by agricultural land use. Public amenity and nature conservation will play major roles in the future management of the scheme; commercial timber production is not a primary objective, and in due course will only be undertaken in minor form for conservational purposes.

In order that the establishment of the woodland is achieved in as natural a manner as possible, it is not intended to employ any artificial establishment aids such as ploughing, fertilisation, herbiciding or drainage. Natural springs, watercourses and wetland will remain undisturbed and unplanted. The young trees will be planted directly on to the existing ground surface to emulate as much as possible the natural establishment process. Planned open space will occupy 20% of the plantable area, sited compatibly to satisfy both internal forest design and external landscaping requirements. The principal residual beneficial impact of the proposals will be the creation of a native pinewood environment in an area which, although within the boundaries of the former range of Caledonian pinewoods, bears no existing remnants due to centuries of agricultural reclamation. Flora and fauna unique to this ecosystem should eventually, over the much longer term, colonise the new habitat. A further beneficial impact, again in the longer term, will be the recreational facility provided by a sizable natural woodland environment for the local population. An existing network of old quarry bridlepaths will be retained free of tree cover for this purpose, and woodland design plans have catered for the provision of vistas and open space to be integrated into overall management plans.

The planting proposals, whilst retaining all quarry workings free of tree cover, should also assist in softening the current obtrusiveness and artificiality of the spoil heaps in the landscape of the area especially as viewed from the A96 trunk road to the north of Foudland Hill. This principal mitigating consideration, the industrial archaeological presence of the quarries, serves to assist in fulfilling the major objective of retaining the open aspect of the hills. The principal residual negative impact of the proposals is that of the loss of a sizable area of dry heather moorland in an area of the region which already carries a very small proportion of this land classification type. Associated flora and fauna, particularly moorland birds such as red grouse, skylark and meadow pipit will be adversely affected. However, the retention of a gross total of approximately 130 hectares of open land will allow for the retention of a permanent presence of most flora and fauna species which are threatened, thus diminishing the adverse ecological impact of the woodland proposals. A further negative impact will be caused by the development over the longer term regarding the loss of the 'open' panoramic views internally looking outwards over the district. This is more pronounced over the Red and Stony Hills to the west of the proposal area. Open space has, however, been retained around the summit of Red Hill, and vistas, although less panoramic, are retained. Over Foudland Hill, however, the element of exposure precludes any tree planting on its upper reaches - 360° panoramas from its summit remain unaffected by proposals. The negative impact on the landscape as viewed externally looking into the proposal area is governed principally by the 'presence' of Foudland Hill particularly in the local landscape as a landmark, similar, but to a lesser degree, to the 'presence' of neighbouring Bennachie. The development will inevitably soften this presence over the longer term, but it is hoped that the woodland design will eventually mirror the natural type of woodland cover which presently clothes and complements visually the lower reaches of parts of neighbouring Bennachie.

The general aspect of Foudland Hill is presently marred by a telecommunications mast on its summit, plus a service track up its eastern shoulder - planting proposals, although not screening these directly, should soften their impact on the present landscape. It should be noted, in recognition of all the above impacts, that the woodland establishment process over the area will be extremely slow due to the planned

lack of artificial aids; transitions will be very gradual indeed - adaptation to all environmental changes brought about by the proposals will be eased by the timescale involved. Options of possible land use alternatives for the site have been addressed within the statement; the optimum considered choice by the owner is that of new native woodland development. In view of the scale of the proposals, its location within a Site of Interest to natural Science (SINS), and its visual impact on the landscape, an Environmental Assessment was considered necessary.

1. Description of the Proposals

1.1 Location/extent

The proposals for the New Native Pinewood cover an area of 352.6 hectares encompassing the tract of upland moorland comprising Red, Stony, and Foudland Hills in the Gordon District of Grampian Region. The hill block lies immediately to the south of the Glens of Foudland, a well-known area on the A96 trunk road between Huntly and Inverurie. Huntly lies approximately 7 miles to the north west, and Inverurie 16 miles to the south east of the proposal area.

1.3 Landscape implications

The area of the proposal is prominent in the local landscape, and it is felt that a non-commercial woodland development would benefit the amenity aspect of the district generally. All other woodland in the surrounding area, and the wider region, is either protective or commercial in its objectives - site opportunities for the creation of designed 'natural' woodland of a size to do justice to the creation of permanent specialised habitats associated with native woods are rare in a landscape dominated by effects of agricultural enclosure. From the landscaping point of view within the scheme, the quarries and tips would add interesting diversity to the overall scene; the crags and screes, albeit artificial, would harmonise well with a native pinewood environment - the widespread lichen associations currently colonising the quarry areas remain unaffected by proposals and would add to floral diversity generally. The site bears a designation as a Site of Interest to Natural Science (SINS) - this relates to its geological significance only, not its biological significance.

1.6 Scheme planting, forest design and establishment methods

1.1.6 Summary of planted species

Native Scots pine areas, incorporating 20% native broadleaves	178.9 ha
Native broadleaved areas incorporating 10% native Scots pine	42.2 ha
Planned open space	57.3 ha
Other land retained unplanted	74.2 ha

1.6.2 Species content

Differing tree species will be planted in accordance with the optimum site characteristics appropriate to each species' requirements: in compliance with the natural situation in native pinewoods, group planting will be generally adopted in preference to intimate mixtures; some intermixing, however, will be undertaken at species' transition zones. The table below lists the range of tree species to be incorporated into the design plan, apportioned to percentages of the two mixture types shown on Plan 2, page 8, as follows:

Species	Pine mixture	Broadleaved mixture
Scots Pine	80	10
Silver birch	10	35
Downy birch	-	25
Rowan	4	15
Hazel	1	5
Goat willow	-	4
Aspen	2	4
Juniper	2	1
Holly	1	1
	100%	100%

1.6.3 Planting stock seed sources

Scots pine seed from Caledonian sources within the north-east zone will be employed for stocking the site; Glentanar or Glenderry sources will be favoured. All broadleaved stock will be of Scottish origin, preferably sourced locally to the site.

1.6.4 Fencing
Agricultural stock will be excluded from the site by existing fencing and new stock fencing as necessary. In sections where rabbit populations exist, protective measures, either via population control, fencing or individual tree guards, will be employed. Deer fencing is not considered necessary at this stage.

1.6.5 Ground preparation
The free-draining nature of the soil, plus the natural effect demands of the objectives combine to preclude any widespread cultivation prescriptions - strip swiping of heather is the preferred treatment. Swiped strips will be around 0.8 metres wide and will vary between 1 and 5 metre spacing. The ground preparation prescription has been selected for adoption at Foudland principally in view of the exposed nature of the hilly site; depth of the heather sward over the plantable area varies generally between 25 and 45 cm. - the use of planting stock smaller than this ensures that, for the initial few seasons' growth when the trees are at their most vulnerable from exposure damage and transplanting weakness, they are recessed in swiped strips, sheltered below the level of the heather sward (see appendix VII, Plate G). Winter snow also accumulates in the swiped strip and to a large extent protects the trees from severe climatic excesses. To minimise the temporary visual obtrusiveness of the strips, especially on prominent slopes, strips will follow the contour wherever possible. Photographic illustrations of the visual impact of the prescription appear in Appendix VII. Where steepness of side gradient becomes too great to permit this operation to be undertaken safely shallow tining at 3 metre centres will be undertaken as an alternative treatment. 224 hectares, net of planned open space, are to be planted: the anticipated percentage breakdown of above ground preparation treatments is as follows:-

Strip swiping	- 60%
Tining steep slopes	- 17%
Direct planting without preparatory treatment	- 13%
Unplanted ground - small glades, screes, woodland edge scalloping etc.	- 10%

1.6.7 Forest design/planting densities
The combination of planned open space plus unplantable land over the project as a whole allows for a total of 37% of the area to remain unplanted. This, combined with the 'naturalisation' prescriptions outlined below, should create the framework for a fully integrated native woodland ecosystem to develop progressively. Spacing between plants and planted strips will be variable throughout at between 1 and 5 metres, meaning at 3 metre spacing overall i.e. 1,100 plants per hectare. The ground preparation prescription will allow for numerous small unplanted areas to be formed within both the pine and broadleaved mixture areas as terrain, exposure and vegetation dictate, in order to further diversify the eventual canopy cover - stocking allocated to these areas will be incorporated elsewhere within the scheme on suitable sites. Given that the element of exposure is significant on this particular scheme proposal, one situation where the above prescription is pertinent applies on Foudland Hill above the 380 metre a.s.l. contour. Above this level, all planting will be undertaken at a density equivalent to at least 1,600 plants per hectare to afford the young plants the benefit of mutual shelter at an earlier stage in their establishment - open space thus realised between groupings of denser stocking here should integrate well with the planned open space and unplanted land on the upper reaches of the hill. Within planned open space areas generally, opportunities will be sought to plant small clumps on sites favourable to particular species to further naturalise the forest design; particular attention will be paid to the open space areas sited towards the summit of Foudland Hill - those areas outlined as hatched on Plan 2 will have random sized groups of pioneer species, progressively diminishing in density with elevation to emulate 'tree line' stocking in a natural situation. Mean stocking density over hatched areas will be less than 10%. Particular attention will be paid to forest edges where a progressive reduction in planting density will occur. Further scalloping and plant density reduction will apply to internal open space edges. Stocking allocated to these areas from the overall mean density provision will also be redistributed to areas requiring denser stocking, as outlined above. Diagrammatic representation of various stocking patterns are detailed in Appendix X. The design prescription has also incorporated provision for areas of broadleaved stocking, plus open space, to act as 'buffer zones' to areas where spread of non-indigenous species into the area by seeding could occur, for example, the western periphery of Red Hill. any exotic conifer seeding which, in due course, does occur in these areas will thus be easily identified and removed manually. Possible eventual seeding of planted stock into open space and quarry areas will be strictly monitored in accordance with overall scheme design objectives.

2. Site description

2.1 Geographical Situation

The site for the proposed New Native Pinewood Scheme lies at the outer edge of the north east foothills of the Grampian range of mountains. The scheme site forms part of a chain of broadly similar elevation which runs west to east across Central Gordon District, comprising from the west, Tap O' North, Hill of Corskie, Knockandy Hill, Wishnach Hill, Red Hill, Hill of Foudland, Hill of Skares, Hill of Tillymorgan and Hill of Rothmaise. These have been collectively known in the past as 'The Slate Hills of Gordon', and most individual hills present some degree of commercial forestry planting.

2.2 Topography

2.2.1 Internal site topography

The lower elevation of the proposal site, with the exception of a narrow extension down the south watercourse, lies at around 300 metres above sea level. The topography, from west to east, is as follows:- Red Hill, at the western end, rises to 378 metres above sea level – a broad, curving ridge 1.5 kilometres long extends eastwards to link to the western shoulder of Hill of Foudland; this rises relatively steeply for 0.5 kilometre to its summit ridge, which is 1 kilometre long and peaks centrally at 467 metres above sea level: the eastern shoulder of the hill drops to the east scheme boundary at around 300 metres above sea level.

2.2.2 Site topography within landscape

The most frequently seen aspect of the proposal site is as viewed from the A96 trunk road travelling south eastwards from the north side (see Plate 19, page 37). This particular view of Foudland Hill is very prominent to travellers proceeding along the road as viewed in the photograph. The hill's presence, however, is less dominant visually to road users thereafter on this route , as line of sight is drawn by natural topographical forces down the Glens of Foudland to Hill of Tillymorgan at the east end. Although the quarry features are somewhat hazily represented in the summer photograph, under certain aspects of sunlight and seasonal conditions, they can scar quite obtrusively an otherwise fine upland landscape. The presence of quarries and tips on to the southern face of Foudland Hill (see Plate 18, page 36) is less obtrusive, due to lesser past quarrying activity, plus only distant views of the hill being prevalent here. This allows the workings to emulate the screes commonly found on many rolling Grampian upland landscapes.

2.11 Statutory Designations

The Regional Indicative Forestry Strategy describes the area as 'prospective' for forestry development, and Grampian Regional Council's Economic development and Planning Department classify the area as "outwith Areas of Regional Landscape Significance".

3. Site Assessment

3.4 Landscape

Foudland Hill, being the dominant landform over the proposal area, exerts considerable influence visually in the immediate district (see Appendix IX – Visual Forces Map). This is particularly evident from its southern aspect (see Plate 19, page 38) where a sizable basin of lower lying land, incorporating the village of Insch, extends to the northern extremity of Bennachie 5 miles to the south, thus rendering the hill as a major component of the landscape from this aspect. The A96 trunk road, also reveals this landscape to its travellers in their route north (see Plate 3, page 16). From its other approaches . Foudland Hill lies more within a rolling upland landscape, and its presence is consequently less dominant from the distant viewpoint, but nevertheless quite prominent as viewed from the A96 trunk road travelling west (see Plate 4, page 16). From the internal viewpoint, fine panoramic views are obtained from the upper reaches of Foudland Hill especially (see Plates 15 & 16, page 22), and the 'spirit of the place', or *genus loci*, is very tangible within this context, presumably due to the presence of past human industry, now derelict (see Plates 13 & 14, page 21).

4. Significant Environmental Effects of the Proposals Plus Mitigating Measures Adopted

4.6 Landscape

Since the landform of the proposal area is visually prominent, it was important that woodland design principles integrated well with the present landscape. This situation is best addressed by reference to the photo-montages in Plates 19 and 20, page 38. These present the most prominent views of the area from the north and south aspects respectively. The accompanying visual design projections for the proposals from these viewpoints are incorporated diagramatically on page 35a adjacent, along with design

considerations. When viewed in conjunction, the woodland boundaries chosen present the optimum compromise to enable the proposals to contribute successfully to their surroundings.
Negative aspects of the present landscape, for example the commercial plantation clothing the lower south-eastern end of the shoulder of Foudland Hill (see Plate 7, page 18), and the small geometric plantings on Skirts of Foudland (see Plate 20, page 38), will be softened by the coalescing effect of the new proposals. If left unimproved, these features would become even more obtrusive with increasing age and size. Similarly, the garish distant quarry landscape on the north side of Foudland Hill is softened by the new planting, and the woodland development would in the longer term cloak the obtrusive aspect of the communications mast and its service track as distantly visible from the A96 trunk road which is visible in the lower central part of Plate 12, page 20.
The primary negative impact of the new woodland in the landscape in the first half of the rotational period is its lack of age class diversity – the 'plantation effect' is an unavoidable necessity to ensure healthy silvicultural establishment. Design plans resolve to minimise this adverse impact as much as possible via methods outlined in Section 1.6.7, page 6. Remedial works to rectify this situation, mainly involving restructuring felling coupes and regular phased replanting will be built into subsequent working plans to ensure continuity of this long term programme. The eventual aim will be to produce a varied woodland ecosystem such as can be seen to be beginning to develop in Appendix VI, Plates A and D.

4.10 Summary of Significant Effects of Proposals, Plus Mitigating Measures

Beneficial	**Adverse**	**Plus mitigating measures**
1. Improvement to landscape in 'wider' context	Loss of open moorland in landscape Clothing prominent hill with tree cover	Sensitive woodland design – planned open space, woodland edge scalloping Retention of 40% of area as undeveloped
4. Improvements to landscape in 'close' context	Cloaking archaeologically interesting relics of past industry with forest	Sensitive woodland design/integration with pinewood environment

5. Future Monitoring of Significant Effects
In order that a progressive evaluation can be made as to the environmental changes that the proposals will bring to the site, it is intended that regular monitoring of various factors takes place; any areas that begin to develop trends towards lack of fulfilment of scheme objectives can also have remedial prescriptions undertaken.

The Woodland Grant Scheme management contract runs for five years before re-assessment and renewal. It is proposed that at the end of every five-yearly period, regular fixed assessments are undertaken and recorded to monitor the rate of development of the woodland, the effects of its development on existing floral associations, the eventual introduction of flora new to the site, fluctuations and changes to bird and animal population densities and distribution within the site etc.

It is proposed to achieve this by fixing a series of predetermined plots of, say, 100 sq. m on a representation of site types over the area, recording information and thus progressively building up a data bank for assisting formulation of subsequent Woodland Grant Scheme management plans for the area. The Forestry Commission's research Branch Station at Newton near Elgin, Moray, were contacted in this connection, and expressed interest in becoming involved with monitoring, should proposals be approved.

These measures should maximise efficiency of subsequent environmental management of the scheme. Findings could also aid future planning of similar projects elsewhere.

Environmental Statement Extracts — Appendix 4.1.5

Mitchellslacks and Locherben Afforestation Proposal

2. Summary

The proposal is to create a woodland at Mitchellslacks and Locherben Farms of 250 ha and 132.5 ha respectively over an area which currently forms approximately 18.82% of the total agricultural holding. It will provide an alternative to the present low agricultural activity due to poor soils which are more suited to woodland production. The unimproved grassland area has been grazed with low annual stocking and is considered to be of low value in relation to the rest of the farm.

The creation of the woodland, of which 24.5% will be native broadleaves and bare ground, will enable some of the existing wildlife habitats to be enhanced and encourage an increased number of flora and fauna for a period of 5-10 years especially when the sheep stock are taken off and the grazing has ended. The majority of the stocked woodland area will be planted with commercially proven conifers which grow well on upland sites. The different tree species, integrated with open ground, will provide a visual variety to emphasise both the landscape features and landform.

The Environmental Statement prepared for Mitchellslacks and Locherben describes the primary issues arising from the proposals and considers the impact on landscape and conservation matters, both locally and in the wider context of land use. Bird species currently dependent on the open ground will be affected by the reduction of their habitat arising from the planting of trees, however the effect will be compensated for by an increasing number of woodland bird species, progressing to further diversity at the second rotation when having a variety of tree species and age classes. Individual botanical sites, as shown in the vegetation survey, will be protected to both enhance habitats and safeguard their future. The archaeological significance of the area is considered to be low although there are cairns and enclosures which will be protected.

4. Description of the Proposal

4.1 General

The area to be planted extends to 382.5 ha of which 132.5 ha is situated on Locherben Farm and 250 ha on Mitchellslacks Farm, both of which are on hill ground in the Upper Nithsdale district of Dumfries & Galloway Region. The area is within the Central Southern Uplands Environmentally Sensitive Area recently designated by Scottish Natural Heritage and administered by Scottish Office Agriculture and Fisheries Department. The areas are shown in Appendix1, Map1, which outlines the proposed woodland and its significance in relation to the surrounding area and secondly in relation to the size of the farms.

Mitchellslacks Farm Area	1141 ha		
Mitchellslacks proposed area	250 ha	=	21.9% of the farm
Locherben Farm Area	891 ha		
Locherben proposed area	132.5 ha	=	14.8% of the farm

Category		Area (ha)	% WGS area
1	Sitka spruce	244.2	63.8
2	Sitka spruce/Hybrid larch 3:1	28.9	7.6
3	Hybrid larch	6.9	1.8
4	Mixed conifer NS/SS	2.1	0.5
5	Oak	11.0	2.9
6	Oak/SP 10:1	2.2	0.6
7	New Native Woodlands	18.5	4.8
8	Noble fir	6.4	1.7
9	Open ground, Roads, Rides	62.3	16.3
Total		382.5	100.0

Category		Area (ha)	% WGS area
1	Conifer planting	288.5	75.4
2	New Native Woodlands	31.7	8.3
3	Open ground	62.3	16.3
Total		382.5	100.0

4.3 Forest Establishment Works

- The three areas Locherben, Thriep Moor and Nether Dod are to be planted during a 5 year period
- Thriep Moor is already stock fenced, Nether Dod will require a new fence on the western and northern boundaries within the farm
- Ground preparation will consist of both mounding and double mouldboard ploughing the former being preferred where suitable soil conditions occur bearing in mind that mounding will create a more stable crop causing the least initial impact on the landscape planning of sites.
- Manual planting of at least 2500 trees per ha for conifer and at least 1100 broadleaves per ha to be planted post winter severe conditions
- Fertiliser will be applied at a rate of 450 kg of phosphate on the mineral and planting site with 650 kg of phosphate and potassium on the less fertile deep peats to facilitate early rapid growth of the young trees
- The young crop will be kept free of weed competition by either hand weeding or application of approved herbicides as necessary

5. Site Description

5.1 Location and Land Use Context

The farms of Mitchellslacks and Locherben are situated on the lower foothills west of Queensberry, the highest of the Lowther Hills in Mid Nithsdale, South Scotland. The proposed new woodlands are sited on the southern edge of these two farms. The area is located 7 miles south east of the village of Thornhill, 5 miles east of Closeburn and 6 miles north of Parkgate. The southern boundary of the proposed area is adjacent to the edge of Ae Forest (Forest Enterprise). The location of the proposal within the Dumfries & Galloway Draft Indicative Forest Strategy Plan is classified as sensitive.

The proposed woodland is currently grazed by sheep and cattle which is a typical agricultural use of the area. To the south forestry is the main landuse. To the north sheep farming accounts for 90% of land use within 8 kilometres. Woodlands account for 43% of the landuse within a 5 kilometre radius of Mitchellslacks which will increase to 47.3% of the 7850 hectares. Woodlands account for 29% of the landuse within a 10 kilometre radius of Mitchellslacks which will increase to 30% of 31400 hectares.

5.10 Landscape and Historic Land Use

The landscape in the district is mainly of upland moorland grassland on rounded hills typical of the Southern Uplands. It is dominated by Queensberry Hill in the east, rising to 697 metres amsl and the wide mid Nithsdale valley with the hills of the Scar and Upper Nithsdale seen to the north and west. Sheep farming dominates the whole valley and Southern Upland range, part of which comprises the proposal. Throughout centuries the area has evolved through scrub woodland with wild creatures to sporting moors and eventually to the sheep rearing production of the last century.

6. Site Assessment

6.1 People

Two people are currently employed on Mitchellslacks, although the aim is shortly to reduce it to one person when the tenant farmer retires. Both employees reside on the property. Two sisters rent and manage Locherben, employing one shepherd. All three are resident.

7. Significant Effects of the Proposal

7.1 People

Mitchellslacks presently employ two people annually and Locherben employ 3 persons. Both farms enlist extra help during busy handling times. With an assessed average rotation length of 37 years for the first crop (ranging from 33 to 45 years) the following figures summarise the expected employment resulting from the proposal.

Future Employment

New Woodland Area (year)	Man Years
1-5	7.4
6-8	1.8
9-16	2.6
17-20	16.8
21-24	26.8
25-30	10.7
31-35	8.7
36-40	11.8
41-45	7.1
Total	93.5

The average annual employment for the first rotation is calculated as total number of man years divided by the average rotation length for the proposal. Therefore 93.5 man years divided by 37 = 2.5 man years per annum for the woodland proposal. The result of the proposals in terms of rural employment over the area is predicted to be an increase of 1.5 man years. This is made up of one person on Mitchellslacks, three on Locherben plus nearly two and a half within the woodland project, albeit they will not be rural inhabitants but personnel who live within a 15 mile radius.

Appendix 7 Future Employment Calculations

During the life of the crop of trees various operations are carried out employing varying numbers of operators. To give an estimate of future employment from work on the Woodland proposals the quantity of work required for each year of the crop rotation from planting to harvesting has been calculated in man years. This should equal 46 weeks in which 5 days are worked, equalling 230 working man days per man year. The first 5 years of establishment work involves a variety of operations which have been detailed annually thereafter the work is more consistent and has been grouped in works of a similar nature.

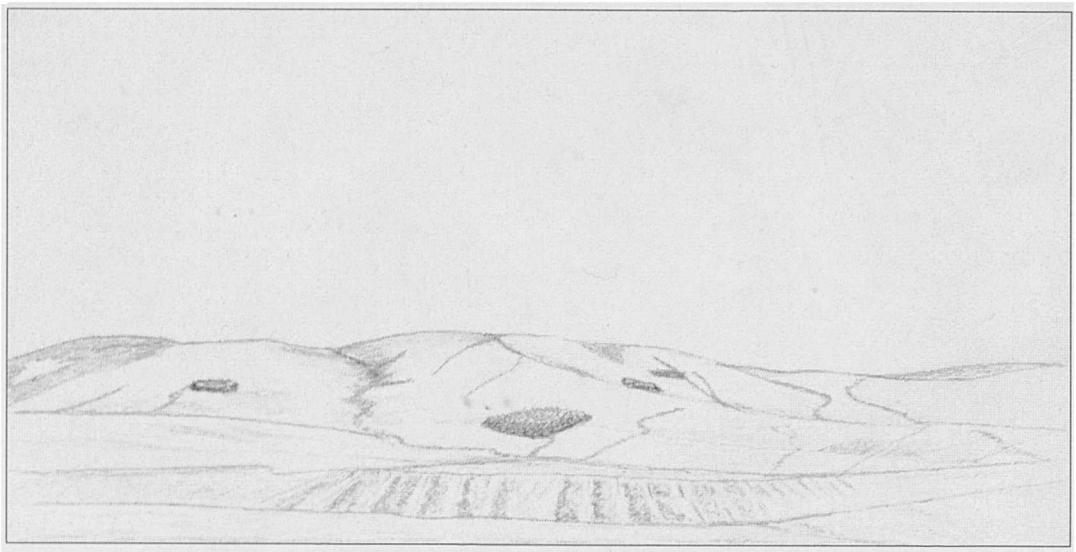
With felling starting at 30 years and finishing at 45 years giving an average age of 37 years it has therefore been calculated that there is 93.5 man years of work in the total project and if divided by the number of years of the life of the crop:

93.5 divided by 37 = 2.52 man years

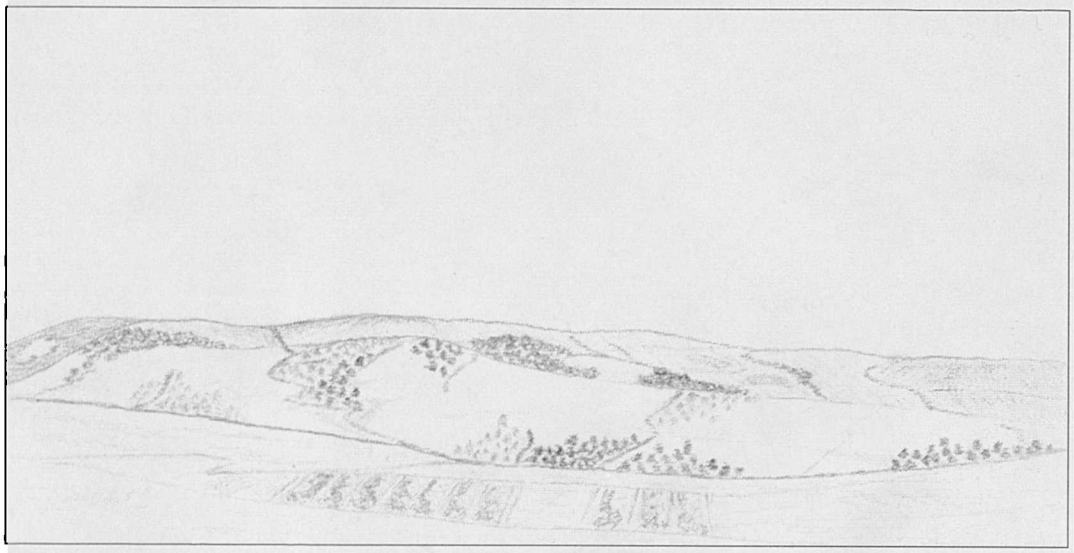
In addition to the employment from woodland operations the farms will continue to employ:

Mitchellslacks 1
Locherben 3

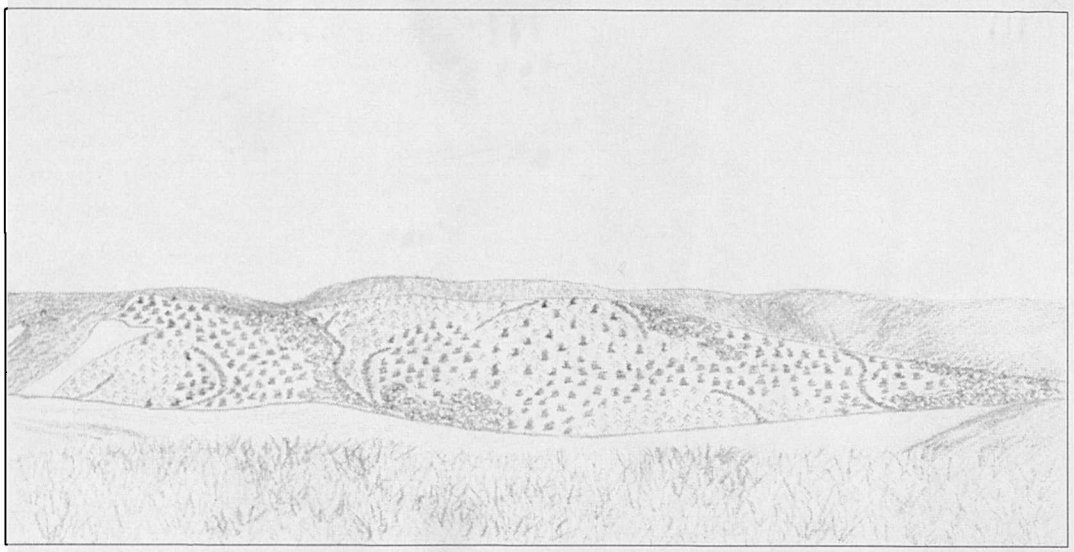
Landscape Assessment Images - Cornharrow **Appendix 4.2.1**



Scene 1

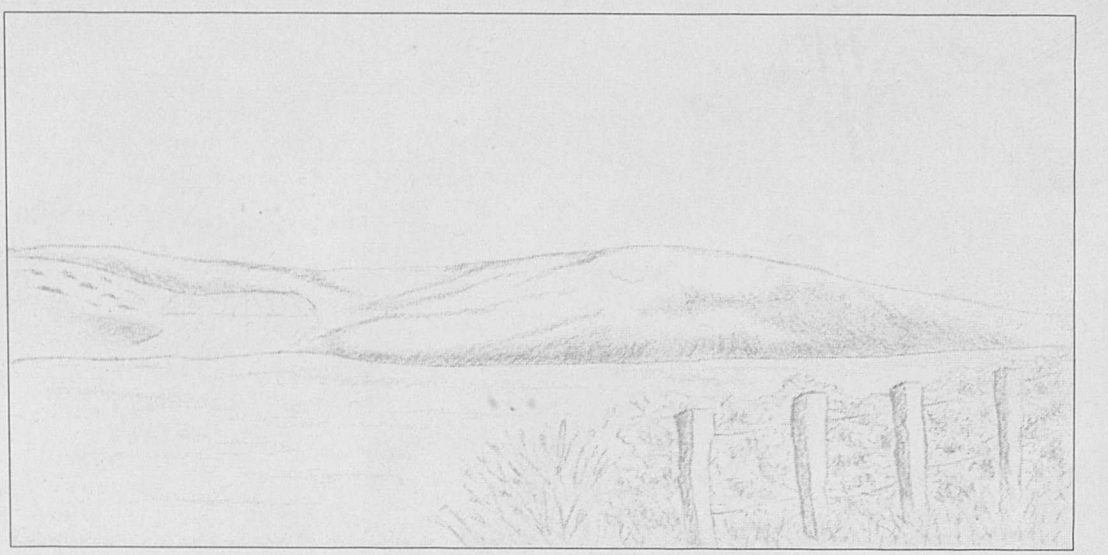


Scene 2

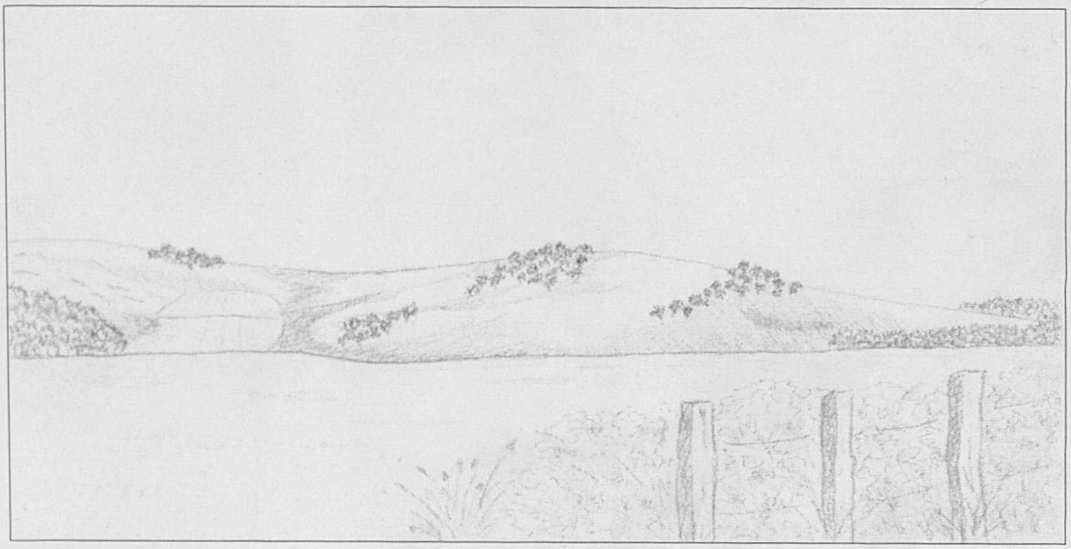


Scene 3

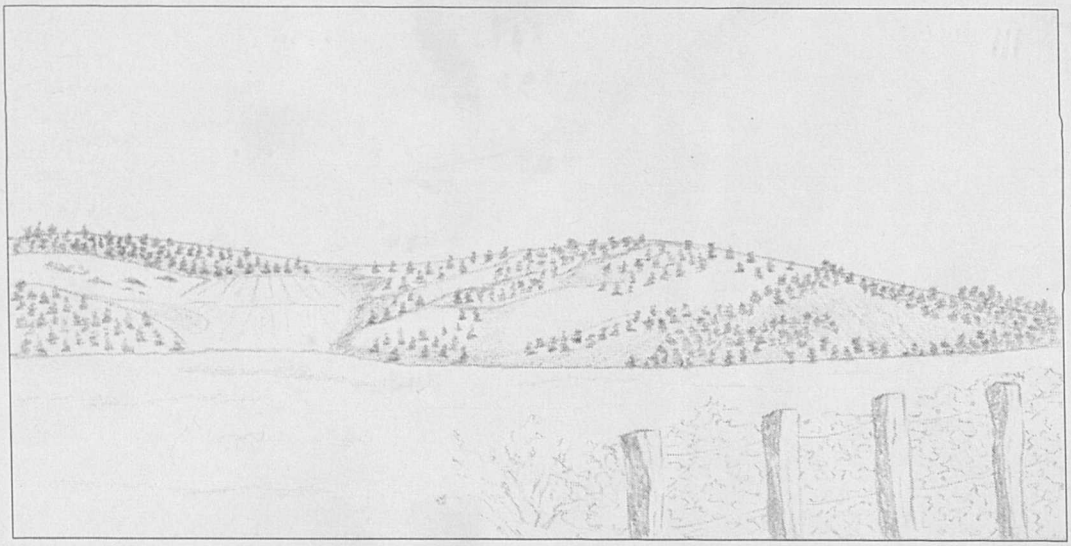
Landscape Assessment Images - Hill of Foudland **Appendix 4.2.2**



Scene 1

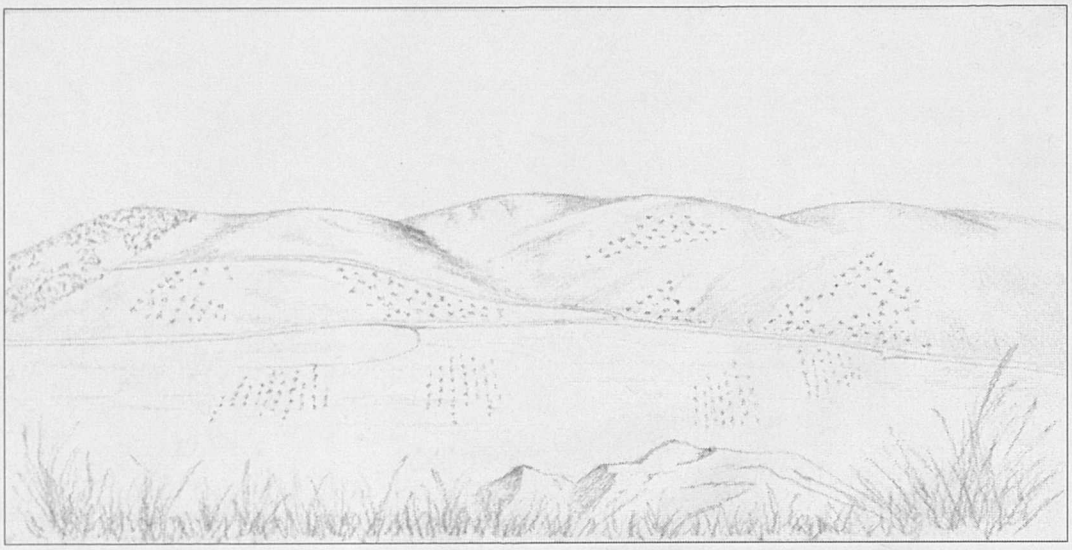


Scene 2

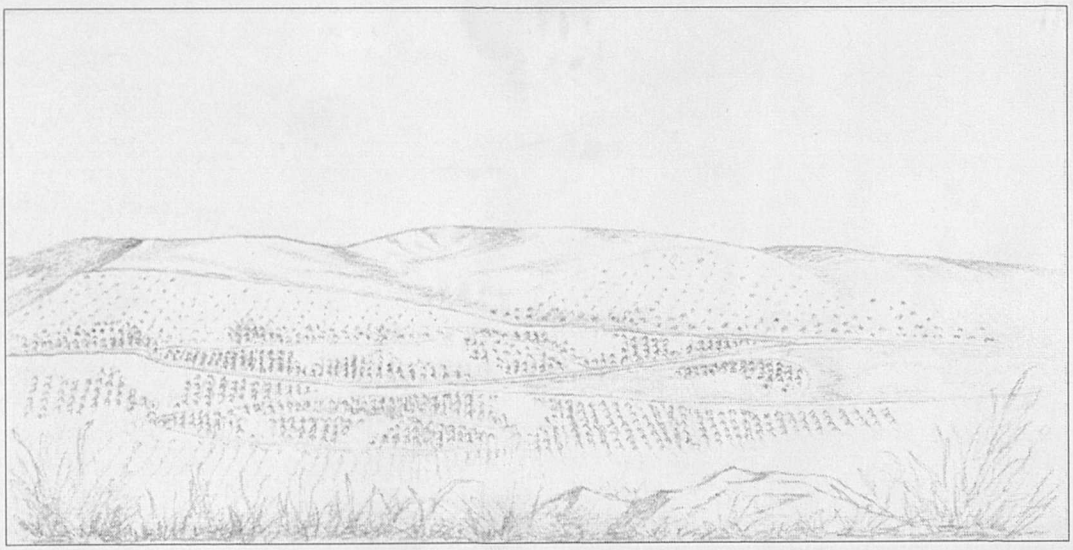


Scene 3

Scene 1



Scene 2



Scene 3

EIA Landscape Assessment
PUBLIC QUESTIONNAIRE

No:
Date:

Name:	Sex: M F	Address:
Profession:	Age: <18 19-30 31-45 46-60 61+	

This research project has been investigating EIA in the forest sector since 1996. One of the common issues included in forestry EIAs is the effect of forestry proposals on the environment. This questionnaire seeks to understand people's attitude to forestry development in the landscape, and assess the level of public knowledge about forestry regulation and public consultation.

You will be shown 3 case studies, each with 3 scenes. Study each scene, then -
1. Score each scene on a scale 1-5 (1 = strongly like → 5 = strongly dislike)
2. Rank the scenes in order of preference

CASE 1	1 Strongly like	2 Like	3 Neither like/dislike	4 Dislike	5 Strongly dislike
Scene 1					
Scene 2					
Scene 3					

Rank the scenes in order of preference	1st		2nd		3rd	

CASE 2	1 Strongly like	2 Like	3 Neither like/dislike	4 Dislike	5 Strongly dislike
Scene 1					
Scene 2					
Scene 3					

Rank the scenes in order of preference	1st		2nd		3rd	

CASE 3	1 Strongly like	2 Like	3 Neither like/dislike	4 Dislike	5 Strongly dislike
Scene 1					
Scene 2					
Scene 3					

Rank the scenes in order of preference	1st		2nd		3rd	

Landscape Assessment Questionnaire Results **Appendix 4.4**

	Ranking				Grades				
Cornharrow	**1st**	**2nd**	**3rd**		**1**	**2**	**3**	**4**	**5**
Scene 1	19	102	79	**Scene 1**	0	77	67	26	30
Scene 2	132	47	21	**Scene 2**	64	97	29	10	0
Scene 3	49	51	100	**Scene 3**	38	61	30	60	11
Foudland	**1st**	**2nd**	**3rd**		**1**	**2**	**3**	**4**	**5**
Scene 1	70	72	58	**Scene 1**	11	69	83	37	0
Scene 2	55	78	67	**Scene 2**	45	34	71	50	0
Scene 3	75	50	75	**Scene 3**	43	79	52	26	0
Forest Farms	**1st**	**2nd**	**3rd**		**1**	**2**	**3**	**4**	**5**
Scene 1	138	24	38	**Scene 1**	40	104	39	17	0
Scene 2	27	113	60	**Scene 2**	0	56	49	85	10
Scene 3	35	63	102	**Scene 3**	18	40	54	80	8

Landscape Assessment Questionnaire Results Statistical Analyses Appendix 4.4.1

TEST 1: Is there a difference in the distribution of scores between the 5 categories for each of the three scenes in Cornharrow, Foudland and Forest Farms? Use Chi squared test. If it is significant difference (Asymp sig < 0.05) then there is a difference in the scores between categories.

Cornharrow

	Scene 1	Scene 2	Scene 3
Chi Squared	39.880	88.920	16.750
df	3	3	4
Asymp. Sig.	0.000	0.000	0.002

Foudland

	Scene 1	Scene 2	Scene 3
Chi Squared	62.800	14.440	29.400
df	3	3	3
Asymp. Sig.	0.000	0.002	0.000

Forest Farms

	Scene 1	Scene 2	Scene 3
Chi Squared	84.520	57.240	82.600
df	3	3	4
Asymp. Sig.	0.000	0.000	0.000

Conclusion: all 9 samples show a significant difference in distribution of scores between categories. Therefore people did think about the scenes – it wasn't just a random or systematic allocation of scores.

TEST 2: Was there a difference in distribution between scenes? Was the pattern of ranking scores (1,2, and 3s) in one scene different to another? Use chi squared via the cross-tabulation function.

Cornharrow

Scene 1 (1A) : Scene 3 (1C)

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
SCENE1A * SCENE1C	200	100.0%	0	.0%	200	100.0%
SCENE1B * SCENE1C	200	100.0%	0	.0%	200	100.0%

Crosstab

Count

		SCENE1C					Total
		1.00	2.00	3.00	4.00	5.00	
SCENE1A	2.00	38	39				77
	3.00		22	30	15		67
	4.00				14	12	26
	5.00					30	30
Total		38	61	30	29	42	200

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	321.083[a]	12	.000
Likelihood Ratio	343.274	12	.000
Linear-by-Linear Association	164.957	1	.000
N of Valid Cases	200		

a. 5 cells (25.0%) have expected count less than 5. The minimum expected count is 3.77.

Conclusion: Scene 1 and Scene 3 are significantly different in the distribution of scores between categories.

Scene 2 (1B) : Scene 3 (1C)

Crosstab

Count

		SCENE1C					
		1.00	2.00	3.00	4.00	5.00	Total
SCENE1B	1.00	38	26				64
	2.00		35	30	29	3	97
	3.00					29	29
	4.00					10	10
Total		38	61	30	29	42	200

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	302.593[a]	12	.000
Likelihood Ratio	308.892	12	.000
Linear-by-Linear Association	145.605	1	.000
N of Valid Cases	200		

a. 7 cells (35.0%) have expected count less than 5. The minimum expected count is 1.45.

Conclusion: Scene 2 and Scene 3 are significantly different in the distribution of scores between categories.

Scene 1 (1A) : Scene 2 (1B)

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
SCENE1A * SCENE1B	200	100.0%	0	.0%	200	100.0%
SCENE1C * SCENE1B	200	100.0%	0	.0%	200	100.0%

Crosstab

Count

		SCENE1B				
		1.00	2.00	3.00	4.00	Total
SCENE1A	2.00	64	13			77
	3.00		67			67
	4.00		17	9		26
	5.00			20	10	30
Total		64	97	29	10	200

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	311.928[a]	9	.000
Likelihood Ratio	316.488	9	.000
Linear-by-Linear Association	160.096	1	.000
N of Valid Cases	200		

a. 6 cells (37.5%) have expected count less than 5. The minimum expected count is 1.30.

Conclusion: Scene 1 and Scene 2 are significantly different in the distribution of scores between categories.

Foudland Hill

Scene 1 (2A) : Scene 3 (2C)

Crosstab

Count

		SCENE2C				
		1.00	2.00	3.00	4.00	Total
SCENE2A	1.00	11				11
	2.00	32	37			69
	3.00		42	41		83
	4.00			11	26	37
Total		43	79	52	26	200

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	255.238[a]	9	.000
Likelihood Ratio	269.765	9	.000
Linear-by-Linear Association	145.115	1	.000
N of Valid Cases	200		

a. 5 cells (31.3%) have expected count less than 5. The minimum expected count is 1.43.

Conclusion: Scene 1 and Scene 3 are significantly different in the distribution of scores between categories.

Scene 2 (2B) : Scene 3 (2C)

Crosstab

Count

		SCENE2C				
		1.00	2.00	3.00	4.00	Total
SCENE2B	1.00	43	2			45
	2.00		34			34
	3.00		43	28		71
	4.00			24	26	50
Total		43	79	52	26	200

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	334.120[a]	9	.000
Likelihood Ratio	344.308	9	.000
Linear-by-Linear Association	158.818	1	.000
N of Valid Cases	200		

a. 1 cells (6.3%) have expected count less than 5. The minimum expected count is 4.42.

Conclusion: Scene 2 and Scene 3 are significantly different in the distribution of scores between categories.

Scene 1 (2A) : Scene 2 (2B)

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
SCENE2A * SCENE2B	200	100.0%	0	.0%	200	100.0%
SCENE2C * SCENE2B	200	100.0%	0	.0%	200	100.0%

Crosstab

Count

		SCENE2B				Total
		1.00	2.00	3.00	4.00	
SCENE2A	1.00	11				11
	2.00	34	34	1		69
	3.00			70	13	83
	4.00				37	37
Total		45	34	71	50	200

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	344.385[a]	9	.000
Likelihood Ratio	363.661	9	.000
Linear-by-Linear Association	165.044	1	.000
N of Valid Cases	200		

a. 4 cells (25.0%) have expected count less than 5. The minimum expected count is 1.87.

Conclusion: Scene 1 and Scene 2 are significantly different in the distribution of score between categories.

Forest Farms

Scene 1 (3A) : Scene 3 (3C)

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
SCENE3A * SCENE3C	200	100.0%	0	.0%	200	100.0%
SCENE3B * SCENE3C	200	100.0%	0	.0%	200	100.0%

Crosstab

Count

		SCENE3C					Total
		1.00	2.00	3.00	4.00	5.00	
SCENE3A	1.00	18	22				40
	2.00		18	54	32		104
	3.00				39		39
	4.00				9	8	17
Total		18	40	54	80	8	200

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	298.068[a]	12	.000
Likelihood Ratio	267.036	12	.000
Linear-by-Linear Association	130.764	1	.000
N of Valid Cases	200		

a. 9 cells (45.0%) have expected count less than 5. The minimum expected count is .68.

Conclusion: Scene 1 and Scene 3 are significantly different in the distribution of score between categories.

Scene 2 (3B) : Scene 3 (3C)

Crosstab

Count

		SCENE3C					Total
		1.00	2.00	3.00	4.00	5.00	
SCENE3B	2.00	18	38				56
	3.00		2	47			49
	4.00			7	78		85
	5.00				2	8	10
Total		18	40	54	80	8	200

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	502.668[a]	12	.000
Likelihood Ratio	409.547	12	.000
Linear-by-Linear Association	177.829	1	.000
N of Valid Cases	200		

a. 9 cells (45.0%) have expected count less than 5. The minimum expected count is .40.

Conclusion: Scene 2 and Scene 3 are significantly different in the distribution of score between categories.

Scene 1 (3A) : Scene 2 (3B)

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
SCENE3A * SCENE3B	200	100.0%	0	.0%	200	100.0%
SCENE3C * SCENE3B	200	100.0%	0	.0%	200	100.0%

Crosstab

Count

		SCENE3B				
		2.00	3.00	4.00	5.00	Total
SCENE3A	1.00	40				40
	2.00	16	49	39		104
	3.00			39		39
	4.00			7	10	17
Total		56	49	85	10	200

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	296.485[a]	9	.000
Likelihood Ratio	252.598	9	.000
Linear-by-Linear Association	129.803	1	.000
N of Valid Cases	200		

a. 5 cells (31.3%) have expected count less than 5. The minimum expected count is .85.

Conclusion: Scene 1 and Scene 2 are significantly different in the distribution of score between categories.

Scene 3 (3C) : Scene 2 (3B)

Crosstab

Count

		SCENE3B				
		2.00	3.00	4.00	5.00	Total
SCENE3C	1.00	18				18
	2.00	38	2			40
	3.00		47	7		54
	4.00			78	2	80
	5.00				8	8
Total		56	49	85	10	200

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	502.668[a]	12	.000
Likelihood Ratio	409.547	12	.000
Linear-by-Linear Association	177.829	1	.000
N of Valid Cases	200		

a. 9 cells (45.0%) have expected count less than 5. The minimum expected count is .40.

Conclusion: Scene 3 and Scene 2 are significantly different in the distribution of score between categories.

TEST 3: Was there a difference in the overall preference ranking given to the 3 scenes in each location? Use Chi squared test.

Cornharrow

Scene 1 (C1R) : Scene 3 (C3R)

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
C1R * C3R	200	100.0%	0	.0%	200	100.0%
C2E * C3R	200	100.0%	0	.0%	200	100.0%

Crosstab

Count

		C3R			Total
		1.00	2.00	3.00	
C1R	1.00	19			19
	2.00	30	51	21	102
	3.00			79	79
Total		49	51	100	200

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	180.212[a]	4	.000
Likelihood Ratio	205.342	4	.000
Linear-by-Linear Association	125.098	1	.000
N of Valid Cases	200		

a. 2 cells (22.2%) have expected count less than 5. The minimum expected count is 4.66.

Conclusion: there is a difference in the preference ranking between Scene 1 and Scene 3.

Scene 2 (C2E) : Scene 3 (C3R)

Crosstab

Count

		C3R			Total
		1.00	2.00	3.00	
C2E	1.00	49	51	32	132
	2.00			47	47
	3.00			21	21
Total		49	51	100	200

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	103.030[a]	4	.000
Likelihood Ratio	131.040	4	.000
Linear-by-Linear Association	70.388	1	.000
N of Valid Cases	200		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 5.15.

Conclusion: there is a difference in the preference ranking between Scene 2 and Scene 3.

Scene 1 (C1R) : Scene 2 (C2E)

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
C1R * C2E	200	100.0%	0	.0%	200	100.0%
C3R * C2E	200	100.0%	0	.0%	200	100.0%

Crosstab

Count

		C2E			Total
		1.00	2.00	3.00	
C1R	1.00	19			19
	2.00	102			102
	3.00	11	47	21	79
Total		132	47	21	200

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	157.806[a]	4	.000
Likelihood Ratio	192.648	4	.000
Linear-by-Linear Association	105.637	1	.000
N of Valid Cases	200		

a. 2 cells (22.2%) have expected count less than 5. The minimum expected count is 2.00.

Conclusion: there is a difference in the preference ranking between Scene 1 and Scene 2.

Foudland Hill

Scene 1 (S21) : Scene 3 (S23)

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
S21 * S23	200	100.0%	0	.0%	200	100.0%
S21 * S22	200	100.0%	0	.0%	200	100.0%

Crosstab

Count

		S23			
		1.00	2.00	3.00	Total
S21	1.00	70			70
	2.00	5	50	17	72
	3.00			58	58
Total		75	50	75	200

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	291.852[a]	4	.000
Likelihood Ratio	320.664	4	.000
Linear-by-Linear Association	170.774	1	.000
N of Valid Cases	200		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 14.50.

Conclusion: there is a difference in the preference ranking between Scene 1 and Scene 3.

Scene 1 (S21) : Scene 2 (S22)

Crosstab

Count

		S22			
		1.00	2.00	3.00	Total
S21	1.00	55	15		70
	2.00		63	9	72
	3.00			58	58
Total		55	78	67	200

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	283.223[a]	4	.000
Likelihood Ratio	308.449	4	.000
Linear-by-Linear Association	166.716	1	.000
N of Valid Cases	200		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 15.95.

Conclusion: there is a difference in the preference ranking between Scene 1 and Scene 2.

Scene 2 (S22) : Scene 3 (S23)

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
S22 * S23	200	100.0%	0	.0%	200	100.0%
S22 * S21	200	100.0%	0	.0%	200	100.0%

Crosstab

Count

		S23			Total
		1.00	2.00	3.00	
S22	1.00	55			55
	2.00	20	50	8	78
	3.00			67	67
Total		75	50	75	200

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	269.402[a]	4	.000
Likelihood Ratio	297.534	4	.000
Linear-by-Linear Association	162.814	1	.000
N of Valid Cases	200		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 13.75.

Conclusion: there is a difference in the preference ranking between Scene 2 and Scene 3.

Forest Farms

Scene 1 (S31) : Scene 2 (S32)

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
S31 * S32	200	100.0%	0	.0%	200	100.0%
S33 * S32	200	100.0%	0	.0%	200	100.0%

Crosstab

Count

		S32			Total
		1.00	2.00	3.00	
S31	1.00	27	111		138
	2.00		2	21	23
	3.00			38	38
	22.00			1	1
Total		27	113	60	200

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	191.374[a]	6	.000
Likelihood Ratio	231.619	6	.000
Linear-by-Linear Association	43.254	1	.000
N of Valid Cases	200		

a. 4 cells (33.3%) have expected count less than 5. The minimum expected count is .14.

Conclusion: there is a difference in the preference ranking between Scene 1 and Scene 2.

Scene 3 (S33) : Scene 2 (S32)

Crosstab

Count

		S32			Total
		1.00	2.00	3.00	
S33	1.00	27	8		35
	2.00		63		63
	3.00		42	60	102
Total		27	113	60	200

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	217.283[a]	4	.000
Likelihood Ratio	205.804	4	.000
Linear-by-Linear Association	122.853	1	.000
N of Valid Cases	200		

a. 1 cells (11.1%) have expected count less than 5. The minimum expected count is 4.72.

Conclusion: there is a difference in the preference ranking between Scene 3 and Scene 2.

Scene 1 (S31) : Scene 3 (S33)

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
S31 * S33	200	100.0%	0	.0%	200	100.0%
S32 * S33	200	100.0%	0	.0%	200	100.0%

Crosstab

Count

		S33			Total
		1.00	2.00	3.00	
S31	1.00	35	63	40	138
	2.00			23	23
	3.00			38	38
	22.00			1	1
Total		35	63	102	200

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	86.331[a]	6	.000
Likelihood Ratio	111.021	6	.000
Linear-by-Linear Association	20.335	1	.000
N of Valid Cases	200		

a. 4 cells (33.3%) have expected count less than 5. The minimum expected count is .18.

Conclusion: there is a difference in the preference ranking between Scene 3 and Scene 2.
[All stats done in SPSS v 9.0]

Employment Assessment Significance Questionnaire Appendix 4.5

Environmental Impact Assessment in the UK Forest Sector
Impact of Afforestation Proposals on Employment
Determination of Significance

This is part of a research project investigating impacts of forestry in the UK, supported by the Forestry Commission and the Scottish Forestry Trust. EIA seeks to predict the potential impacts of projects before a project is approved. The assessment of impact is centred of highlighting major or significant impacts. This survey seeks to identify what people regard as a major or significant impact on employment due to forestry. If an impact is negative – how large an impact will you allow before the costs outweigh the benefits? If an impact is positive – how large does an impact need to be before it is too good to miss?

						Question 1 Dumfries & Galloway has a working population of 69800 and an unemployment rate of 8.3% (5800). If a project was likely to result in a number of new jobs how many jobs would you consider necessary before it would make a significant impact on the levels of employment in the region?	**Question 2** Highland has a working population of 107800 and an unemployment rate of 10.2% (11000). If a project was likely to result in a number of new jobs how many jobs would you consider necessary before it would make a significant impact on the levels of employment in the region?
No	Male/ Female	Employed/ Unemployed	Forestry/ Non-forestry	Age 16-65	Age >65	Q 1 Number of jobs	Q 2 Number of jobs
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							

Employment Assessment Significance Results **Appendix 4.6**

Dumfries & Galloway			*Highland*	
Mean	182.53		Mean	229.045
Standard Error	6.949523356		Standard Error	13.07917
Median	175		Median	200
Mode	100		Mode	200
Standard Deviation	98.28110182		Standard Deviation	184.9675
Sample Variance	9659.174975		Sample Variance	34212.96
Kurtosis	24.87362315		Kurtosis	80.2429
Skewness	3.650066316		Skewness	7.586121
Range	950		Range	2250
Minimum	50		Minimum	50
Maximum	1000		Maximum	2300
Sum	36506		Sum	45809
Count	200		Count	200
Confidence Level(95.0%)	13.70416343		Confidence Level(95.0%)	25.79157