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## Journal of Fish Biology

DOI: 10.1111/jfb.15385

Published: 01/06/2023

Peer reviewed version

Cyswllt i'r cyhoeddiad / Link to publication

*Dyfyniad o'r fersiwn a gyhoeddwyd / Citation for published version (APA):* Moore, A. (2023). A ray of hope? The re-appearance of Irish Sea skate decades after local extinction. *Journal of Fish Biology*, *10*2(6), 1503-1505. https://doi.org/10.1111/jfb.15385

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# A ray of hope? The re-appearance of Irish Sea skate decades after local extinction

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### Abstract

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A 2019 photograph of a blue skate *Dipturus batis* caught in Welsh waters is the first species-specific evidence of the 'common skate' complex occurring in former range in the main body of the Irish Sea over four decades after it was considered to have been extirpated there. This possible precursor to recolonisation of former range adds to growing evidence for the recovery of skate species in the North Atlantic, and highlights the valuable role of anglers and social media as a complement to important yet costly scientific surveys when monitoring rare fishes.

Key words: conservation, elasmobranch, extinction, fisheries, Irish Sea, species recovery

The disappearance of the 'common' skate in the Irish Sea published in *Nature* (Brander, 1981) bought the risk of elasmobranch extirpations and extinctions to a wide audience, and is a classic case study that helped catalyse global research and conservation efforts for this group. This declaration was based on a known historic occurrence, and a 10-year absence from over 800 trawl research surveys across the Irish Sea, including the waters of north Wales where the current author is based (Brander, 1981). The loss of 'common skate' in the Irish Sea therefore represents a local extinction - the disappearance of a species from part of its natural range, as defined by Estes et al. (1989). The 'common skate' has since

This article has been accepted for publication and undergone full peer review but has not been through the copyediting, typesetting, pagination and proofreading process which may lead to differences between this version and the Version of Record. Please cite this article as doi: 10.1111/jfb.15385

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been determined as a complex of two species (Iglésias et al., 2010; Griffiths et al., 2010). Iglésias et al. (2010) suggested that these be the blue skate (*Dipturus* cf. *flossada* (Risso, 1826)) and the flapper skate (*D.* cf. *intermedia* (Parnell, 1837)), although the scientific names of *D. batis* (blue) and *D. intermedius* (flapper) are now widely used for these species (Ebert and Dando, 2021) and are used herein (n.b. the name 'common blue skate' has also been proposed for *D. batis*; Last et al., 2016). Both species have been assessed by the International Union for Conservation of Nature (IUCN) as Critically Endangered (Ellis et al., 2021a,b).

Several studies have helped to refine the current species-level distribution of both species around the northeast Atlantic including waters to the north and south of the Irish Sea, but none have included records from the Irish Sea itself (ICES, 2012; Bendall et al., 2016; Neat et al., 2015; Frost et al., 2020; Bache-Jeffreys et al., 2021; Phillips et al., 2021). Although recent and historic photographic angling records clearly identifiable as D. intermedius exist from Northern Ireland, these are from the northwesternmost margin of the Irish Sea and are typically from semi-enclosed inlets (loughs) (Housby, 1973; Irish Specimen Fish Committee, 2020). This marginal area is also the only location where 'common skate' have been recorded in an extensive program of annual government trawl surveys throughout the Irish Sea since the 1980s (Heessen et al., 2015). Most recently, McGeady et al. (2022) examined a large set of fishery-independent trawl survey data from the northeast Atlantic and reported an encouraging increase in common skate abundance in several areas; however, there was little evidence of the Irish Sea being recolonised, with only a single 'common skate', not identified to species, reported to the south of the Isle of Man in April 2014 (McGeady et al., 2022). Annual Bangor University demersal fish trawl surveys on the RV Prince Madog in the same north Wales waters as those quoted in Brander (1981) for which data are available have not recorded common skate since at least 2002 (JG Hiddink, ID McCarthy, Bangor University, pers. comms.). Additional surveys specifically targeting rajid skates around north Wales in 2020 and 2021 did not catch common skate; these fished across a range of depth strata and caught all five species of rajids known to regularly occur here (ABMM pers. obs.). As such, there is currently no published evidence confirming species-level presence, distribution or re-colonisation in the main body of the Irish Sea.

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On February  $24^{th}$  2019 a blue skate *Dipturus batis* was caught by angling in approximately 15 m water depth in Caernarfon Bay (North Wales), in the eastern Irish Sea (approximately  $53^{\circ}05'31.3"$ N;  $4^{\circ}27'44.2"W$ ) (pers. comm. Iwan Wyn Owen to ABMM, August 2021) (Figure 1). The specimen was caught during non-targeted bottom fishing and was quickly returned alive. Size is estimated from the photograph at approximately 100 cm total length (not including missing distal part of tail) and 90 cm disc width. Identification as *D. batis* is based on characteristics recommended to distinguish the two species in the field (Iglésias et al. ,2010; ICES 2012; Hetherington et al., 2018), namely the dark 'eye spot' ocellus on the pectoral fin (cf. blotch of grouped pale spots in *D. intermedius*), the pattern of light coloured marbling on the dorsal surface (cf. pattern of distinct yellow to white spots in *D. intermedius*) and the pale yellow colour of the iris (cf. dark green olive iris in *D. intermedius*). Caudal thorns also appear to be laterally projecting perpendicular to the body axis (cf. anteriorly in *D. intermedius*), but are not clearly visible; the missing distal portion of the tail prevents use of the interdorsal space as a character (Fig 1). The specimen most probably represents a female, given the apparent absence of claspers protruding from the pelvic fins and total length consistent with being a subadult or adult (Ellis et al., 2021a).

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To the best of knowledge of the author the current record is the first unambiguous record in peerreviewed literature, identifiable to species, of the 'common skate' complex in the main body of the Irish Sea since it was considered to have disappeared there. It adds to the single 'common skate' (not identified to species) caught in April 2014 to the south of the Isle of Man (McGeady et al., 2022) which together form the first records of the complex in the main body of the Irish Sea for over 40 years (i.e. including the 10 years of absence preceding Brander 1981). Although at least one 'common skate' was reported from the region in trawl data from the 1990s by Dulvy et al. (2000), it is not clear if this was from the Irish Sea or adjacent waterbodies. The current record cannot be dismissed as a vagrant (i.e. a species "known not to be native to the area", IUCN, 2018), because *D. batis* formerly occurred in the Irish Sea, including in Caernarfon Bay (unpublished data). The current record and that from 2014 may therefore be tentative cause for hope for the recovery of the two species of the 'common skate' species complex in the Irish Sea. Inshore waters of northern Wales may particularly facilitate this, given a nearabsence of commercial trawling here in recent decades (unpublished data).

There is growing evidence that depleted elasmobranch populations, including skate, respond positively to effective fisheries management and protected species legislation. Populations of the northwest Atlantic barndoor skate *Dipturus laevis* (Mitchill, 1818) reportedly declined by 96-99% between the 1960s to the mid-1970s, after which it was 'near extinct' for 20 years; a prohibition on landing and possession has seen a recovery to historic levels, and barndoor skate is currently assessed by the IUCN as 'Least Concern' (Kulka et al., 2020). In the northeast Atlantic, a partial recovery of grouped skates in the Celtic Sea has been attributed to a gradual reduction of fishing effort between 1997-2019 (Kempf et al., 2022). Similarly, a prohibition on landings has been thought to be a key factor in the sustained and widespread increase in the 'common skate' species complex in the NE Atlantic in recent decades, and an increase in abundance of the undulate skate there (McGeady et al., 2022, Elliot et al., 2020).

These studies in peer-reviewed journals are often based on large datasets of valuable but costly fisheryindependent trawl surveys, yet recreational angling catches reported less formally can often pre-date these findings: Jones (2021) reported the re-appearance of a number of blue skate in the English and Bristol Channels. Social media plays a significant and increasing role in disseminating these rare early signals of possible recovery to the scientific community, as it did with a Twitter post for the current record (Owen, 2019).

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Figure 1. Blue skate *Dipturus batis* caught by angler Iwan Wyn Owen in Caernarfon Bay, eastern Irish Sea, February 24<sup>th</sup>, 2019.

### Acknowledgements

Many thanks to Iwan Wyn Owen for providing information and original photographs. Thanks also to Gethyn Owen for posting on Twitter, to Jan Geert Hiddink (JGH) for making me aware of this, and to JGH and Ian McCarthy for information on RV *Prince Madog* fish trawl surveys. Thanks to the editor and two anonymous referees for their time and comments, which improved the manuscript.

Bache-Jeffreys, M., de Moraes, B. L. C., Ball, R. E., Menezes, G., Pálsson, J., Pampoulie, C., Stevens, J. R., & Griffiths, A. M. (2021). Resolving the spatial distributions of *Dipturus intermedius* and *Dipturus batis*— The two taxa formerly known as the 'common skate'. *Environmental Biology of Fishes*, **104**, 923–936. https://doi.org/10.1007/s10641-021-01122-7

Bendall, V. A., Hetherington, S. J., Barreau, T., Nicholson, R., Winpenny L. (2016) Common Skate Survey Annual Report (ELECTRA MF6001: Workpackage Task 1.4) Cefas. 30 pp.

Brander, K. (1981). Disappearance of common skate *Raia batis* from Irish Sea. *Nature*, **290** (5801), 48–4

Dulvy, N.K., Metcalfe, J.D., Glanville, M.G., Pawson, M., Reynolds, J.D. (2000). Fishery stability, local extinctions, and shifts in community structure in skates. *Conservation Biology*, **14**, 283–293

Ebert, D.A., Dando, M. (2021). *Field guide to sharks, rays and chimaeras of Europe and the Mediterranean*. Princeton University Press

Elliott, S. A. M., Bearup, D., Carpentier, A., Larivain, A., Trancart, T., & Feunteun, E. (2020). Evaluating the effectiveness of management measures on skates in a changing world. *Biological Conservation*, **248**, 108684. https://doi.org/10.1016/j. biocon.2020.108684

Ellis, J., McCully-Philipps, S. R., Sims, D., Derrick, D., Cheok, J., & Dulvy, N. K. (2021a). *Dipturus batis*. The IUCN red list of threatened species 2021: E.T203364219A203375487

Ellis, J. R., McCully-Philipps, S. R., Sims, D., Walls, R. H. L., Cheok, J., Derrick, D., & Dulvy, N. K. (2021b). *Dipturus intermedius*. The IUCN red list of threatened species 2021:

## E.T18903491A68783461.8235. <u>https://doi.org/10.2305/IUCN.UK.2021-2.RLTS.T18903491A</u> 68783461.en

Estes, J.A., Duggins, D.O., Rathbun, G.B. (1989). The ecology of extinctions in kelp forest communities. *Conservation Biology*, **3**, 252-264

Frost, M., Neat, F., Stirling, D., Bendall, V., Noble, L., & Jones, C. (2020). Distribution and thermal niche of the common skate species complex in the north-east Atlantic. *Marine Ecology Progress Series*, **656**, 65–74. https://doi.org/10.3354/meps13545

Griffiths, A. M., Sims, D. W., Cotterell, S. P., El Nagar, A., Ellis, J. R., Lynghammar, A., McHugh,
M., Neat, F. C., Pade, N. G., Queiroz, N., Serra-Pereira, B., Rapp, T., Wearmouth, V. J., & Genner,
M. J. (2010). Molecular markers reveal spatially segregated cryptic species in a critically endangered
fish, the common skate (*Dipturus batis*). *Proceedings of the Royal Society B: Biological Sciences*,
277 (1687), 1497–1503

Heessen, H.J.L., Daan N., & Ellis, J.R., (2015). Fish Atlas of the Celtic Sea, North Sea and Baltic Sea based on international research-vessel surveys. Wageningen Academic Publishers.

Hetherington, S.J., Nicholson, R.E., Nelson, P., Skirrow, R., Elliott, S., Richardson, J., Barreau, T., Spence, M. (2018) Remote electronic monitoring of common skate by-catch II (ELECTRA MF6001: Work Package Task 1.3). Project report (Cefas).

Housby, T. (1973). Big fish. Gentry Books. London

Accepted Artic

ICES (2012). European Commission special request on spatial distribution, stock status, and advice on *Dipturus* species. Available at <u>https://ices-</u>

library.figshare.com/articles/report/European\_Commission\_special\_request\_on\_spatial\_distribution\_s

Accepted Article

Iglésias, S. P., Toulhoat, L., & Sellos, D. Y. (2010). Taxonomic confusion and market mislabelling of threatened skates: Important consequences for their conservation status. *Aquatic Conservation: Marine and Freshwater Ecosystems*, **20** (3), 319–333

Irish Specimen Fish Committee (2020). Irish specimen fish 2019: annual report. Available at http://specimenfish.ie/wp-content/uploads/2020/01/IRISH\_FISH\_SPECIMEN\_2019\_LR31.pdf [accessed 12 August 2021]

IUCN (2012). Mapping Standards and Data Quality for the IUCN Red List Categories and Criteria
Version 1.16 (September 2018). Available at
<u>https://nc.iucnredlist.org/redlist/resources/files/1539098236-</u>
Mapping Standards Version 1.16 2018.pdf (last accessed 6 February 2023)

Jones, G. (2021). Blue skate: here to stay? Hookpoint web article, March 2021. Available at: https://hookpoint.co.uk/blue-skate-here-to-stay/ (last accessed 9 June 2021)

Kempf J., Breen P., Rogan E, & Reid D.G. (2022). Trends in the abundance of Celtic Sea demersal fish: Identifying the relative importance of fishing and environmental drivers. *Frontiers in Marine Science*, **9**, 978654. doi: 10.3389/fmars.2022.978654

Kulka, D. W., Cotton, C. F., Anderson, B., Herman, K., Pacoureau, N., & Dulvy, N. K. (2020).
Barndoor skate *Dipturus laevis*. The IUCN red list of threatened species 2020:
E.T39771A124413280, 8235

Last P.R., White W.T., de Carvalho, M.R., Serét, B., Stehmann M.F.W., Naylor, G.J.P. (2016). *Rays of the world*. CSIRO Publishing.

McGeady, R., Loca, S. L., & McGonigle, C. (2022). Spatio-temporal dynamics of the common skate species complex: Evidence of increasing abundance. *Diversity and Distributions*, **28**, 2403-2415. <u>https://doi.org/10.1111/ddi.13635</u>

Neat, F., Pinto, C., Burrett, I., Cowie, L., Travis, J., Thorburn, J., Gibb, F., & Wright, P. J. (2015). Site fidelity, survival and conservation options for the threatened flapper skate (*Dipturus* cf. *intermedia*). *Aquatic Conservation: Marine and Freshwater Ecosystems*, **25** (1), 6– 20. https://doi.org/10.1002/aqc.2472

Owen, G. (2019). Tweet by Gethyn Owen @GO\_Angling, February 27<sup>th</sup>, 2019. https://twitter.com/go\_angling/status/1100648124836651010

Phillips, N. D., Garbett, A., Wise, D., Loca, S. L., Daly, O., Eagling, L. E., Houghton, J. D. R., Verhoog, P., Thorburn, J., & Collins, P. C. (2021). Evidence of egg-laying grounds for critically endangered flapper skate (*Dipturus intermedius*) off Orkney, UK. *Journal of Fish Biology*, **99** (4), 1492–1496. https://doi.org/10.1111/jfb.14817