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Skates on thin ice

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The common skate is not at all common: this large marine fish has 'critically endangered' status. That it turns out to be not one species, but two, is a sharp reminder that good taxonomy must underpin conservation.

Conservation biologists who study obscure species in obscure places are faced with the challenge of protecting species they cannot even name. Such taxonomic headaches evidently blight even charismatic species in the best-studied regions of the world — as reported in *Aquatic Conservation*[1], Samuel Iglésias and colleagues have discovered that one of the largest species of fish in the northeast Atlantic is actually two. The common skate, *Dipturus batis*, which grows to a length of more than 220 centimetres, and has 'critically endangered' status on the IUCN Red List of Threatened Species, is really two species with different body sizes, ages at maturity, teeth, fins and eye colour.

These fish were once distributed from Iceland to Morocco and the Mediterranean, and until at least the 1950s they were a prominent component of bottom-trawl catches[2]. Since then they have disappeared from large parts of their ranges. In the seas between southwestern Britain and Ireland, for example, only six individuals were taken between 1988 and 1997 during bottom-trawl research surveys[3], whereas thousands used to be caught accidentally by fisheries using similar gear[2]. French trawlers were still able to catch several hundred tonnes of common skates each year, mainly in deep waters along the edges of the continental shelf in the northeast Atlantic. But behind the scenes, many fisheries scientists wondered how such a large, slowly reproducing fish could sustain these catches.

Iglésias *et al.*[1] have solved the mystery. There are two species, one of which reaches maturity at about 120 cm, the other at 200 cm (Fig. 1). The apparent sustainability of the larger species (one of the biggest skates in the world) was a mirage produced by continued catches of the smaller one, which reaches maturity at a younger age and is almost certainly more productive. Fish-market surveys by Iglésias and colleagues suggest that when landings of common skates from 2005 are reassigned to the correct species, only 140 adults were of the larger species, compared with 8,300 adults of the smaller one. The greater rarity of the larger species is consistent with expectations from life-history theory, whereby large-bodied species have lower potential rates of reproduction and are therefore less able to sustain exploitation[4].

S. IGLÉSIAS

Figure 1 | Big difference. This male fish, with 'claspers' on either side of the tail, is an example of the larger of two species that were previously lumped together as common skate.

We should have seen this coming. In 1926, R. S. Clark[5] stated: "I have noted frequently the occurrence of mature males with large claspers, and other equally large males with the claspers quite undeveloped. So far I have not given any special study to this phenomenon." A study in 1968 made a similar point[6]. Iglésias and colleagues have added numerous other differences, including eye colour, the orientation of tail spines, dorsal-fin spacing, the colour of prominent eyespots on the skate wings, and the shape of the teeth. Indeed, the authors used genetic analyses to show that these two species are not even each other's nearest relatives (the 'near threatened' long-nosed skate, *Dipturus oxyrinchus*, sits between them on the evolutionary tree). Formal taxonomic description is still in the works. But these are clearly very different animals in ways that matter greatly to fisheries sustainability, because their different life histories should translate into different rates of population growth[7].

Even before the discovery of this taxonomic lapse, conservation measures for these and many other skates, not to mention their relatives the rays, sharks and chimaeras, have been ineffective. A new European Union (EU) requirement is that common skates when caught should be returned to the sea, but this applies only to the North Sea[8]. And in their last known refuge, the western continental shelf edge, large skates and rays remain unprotected. An overdue step could be to extend the EU regulation to all large skates, including the 'common-skate complex', the long-nosed skate and the white skate (*Rostroraja alba*), across their entire historic distribution.

This cautionary taxonomic tale extends, of course, more broadly. In the marine realm alone, a vast store of cryptic biodiversity remains to be discovered. For example, a third of all sharks and rays have been described only in the past 30 years — a new one is described, on average, every month[9]. Systematics underpins our understanding of biodiversity, both marine and terrestrial, yet taxonomic science is at best underdeveloped and at worst in decline or even in crisis[10]. If the nations of the EU cannot stir themselves to provide an adequate footing for taxonomy and conservation management even for commercially valuable fish, the outlook in less favoured parts of the world is indeed grim. ■

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