Scarabaeus laticollis on a fresh cow dung pat in southern France. Photo: C. Leandro.

The IUCN Red List conservation status assessment for 400 South African species of dung beetle began in July 2022 and soon we will launch the assessment of 200 species from Australia and 300 species from South America. In due course, we hope to engage with the agricultural sector (farmers, ranchers and veterinarians) through communication outreach. In the long term, we hope to work on the identification of Key Biodiversity Areas and conservation planning for dung beetles.

If you would like to get involved in the work of this new Specialist Group or contribute your expertise to conservation assessments, please fill in the form at forms.gle/kNW6CMxQHPbMp57b6. The more diverse the network, the more relevant our actions will be for the conservation of dung beetles globally.

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Important Shark and Ray Areas: a new tool to optimize spatial planning for sharks

Spatial planning is a priority for biodiversity conservation, and area-based measures have become a key element for identification of sites that are particularly important for biodiversity. Initiatives have been developed for specific taxa, such as birds (Important Bird and Biodiversity Areas) and marine mammals (Important Marine Mammal Areas) and for biodiversity more generally (Key Biodiversity Areas and Ecological or Biologically Significant Marine Areas). These approaches are now well accepted and utilized in spatial and conservation planning.

Until recently, such an approach had yet to focus on sharks and their relatives, the rays and chimaeras (hereafter collectively referred to as sharks), one of the most threatened faunal lineages (37% of species are categorized as threatened with extinction on the IUCN Red List). Overexploitation, unregulated or poorly managed fisheries and trade and, to a lesser extent, habitat degradation and loss, are driving steep declines in many shark populations. Existing area-based conservation approaches have not been designed with this conservation challenge in mind and have not adequately responded to the risk profile of sharks globally.

To address this, the IUCN Species Survival Commission Shark Specialist Group undertook extensive engagement and consultation to develop the Important Shark and Ray Area framework. Modelled on Important Marine Mammal Areas, the development of criteria considered the diverse life histories and unique attributes of sharks. The criteria are applied to identify areas based on shark vulnerability (e.g. species assessed as threatened on the IUCN Red List), range restriction, life history (reproduction, feeding, resting, movement, undefined aggregations), and special attributes (distinctiveness, diversity; Hyde et al., 2022, *Frontiers in Marine Science*, 9, 968853). Resulting Important Shark and Ray Areas are discrete, three-dimensional portions of habitat that are important for one or more shark species and have the potential to be managed for conservation.

Funded by the Shark Conservation Fund, the Important Shark and Ray Area project has begun working through 13 global regions, covering all marine and inland waters where sharks occur. The project brings together regional experts to contribute knowledge and identify important areas. In the first workshop (in Bogotá, Colombia, in October 2022), 55 experts delineated important areas from the Gulf of California, Mexico, to southern Chile in the Eastern Pacific. This week-long process identified 76 candidate Important Shark and Ray Areas, now under review by an independent review panel. The candidates accepted will appear on the Important Shark and Ray Area e-Atlas, an open access tool for exploring areas important for sharks (sharkrayareas.org/e-atlas). The next workshop will be held in the Mediterranean and Black Sea region in early 2023.

The Important Shark and Ray Area process will give governments and policy makers access to scientifically defined areas that can help them advance actions to conserve sharks. This tool will help countries achieve the Convention on Biological Diversity Global Biodiversity Framework 30×30 target (30% of global land and sea conserved through protected areas and other effective area-based conservation measures by 2030). Complementary to other area-based measures, we anticipate that Important Shark and Ray

Areas will be integrated into the recognition of global sites that hold high biodiversity. Overall, delineating Important Shark and Ray Areas globally will transform shark conservation and contribute to reducing mortality in this highly threatened group.

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**Also at: IUCN Marine Mammal Protected Areas Task Force*

Creating safety stock populations of two of the smallest threatened freshwater fishes of Europe

The dwarf goby *Economidichthys trichonis* and the Greek stickleback *Pungitius hellenicus* are both endemic to Greece, have narrow geographical ranges and are categorized as Endangered and Critically Endangered, respectively, on the IUCN Red List. The creation of safety stock populations is a top priority for future conservation translocations of the two species. Therefore, within the framework of conservation project AFRESH (afresh.hcmr.gr), we collected, transferred and acclimatized individuals of both species to closed circuit systems in 2021 and 2022.

The first attempt to transfer *E. trichonis* (maximum length 3 cm), on 10 November 2021, involved the collection with a seine net of 107 individuals from Lake Trichonis, at a water temperature of 19 °C. Fish were transported in an 80 l aerated tank. Mortality upon arrival following a transport time of 4 h was 46%, attributed to the mode of transport and/or to intestinal parasitosis. Despite subsequent anti-parasite treatment, only 12 individuals survived. We identified transport stress and intestinal parasitosis as the causes of mortality, to be addressed through modification of the collection and transport protocol. On 16 November 2022, 89 fish were caught with a seine net at a water temperature of 20 °C, and transported in groups of 1–4 fish in plastic bottles supplied with pure oxygen from a portable cylinder. Upon arrival, with no mortalities, fish were acclimatized to 17.7 °C and then treated with anti-helminthic medication.

A dwarf goby *Economidichthys trichonis* (total length 2.5 cm) guarding its nest in a reed. Photo: Y. Kapakos.

They were kept initially in low lighting and provided with live *Artemia* nauplii daily. Fish were observed feeding after 48 h, and 3 weeks after transfer all fish appeared healthy, with no mortalities.

The first attempt to transfer *P. hellenicus* (maximum length 5 cm), on 19 January 2022, involved the collection of 40 fish by electrofishing, from an irrigation channel at a water temperature of 8 °C, in Sperchios basin, and transfer in an 80 l aerated tank, with a transport time of 3 h. Transport was completed with no mortalities and fish were then acclimatized to 20 °C. However, there were primary and secondary parasite infections, and the fish did not feed, with mortalities starting after 3 weeks. Only five individuals survived. We identified the temperature difference between collection site and housing aquaria, and absence of feeding, with subsequent parasitosis, as the main issues to be addressed. On 9 November 2022, 32 *P. hellenicus* were collected, at a water temperature of 12.2 °C, and, following anti-parasite treatment, they were transferred to the laboratory and acclimatized to 15.6–16.6 °C. They were offered live *Artemia* nauplii and *Tubifex* worms, and were observed feeding soon after transfer. Four weeks after transfer mortalities were zero.

This work highlights the need to address a wide array of issues related to handling, mode of transfer, acclimatization issues, disease prevention and dietary differences when creating fish stock populations of threatened species.

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