Case study

Ray

Disclaimer: *The case study presented below is for a* ***fictional*** *species and is intended for training purposes only. The information presented in this account is not intended to reflect accurate information for any real species or the current situation within any particular country. This case study must not be cited for any purpose outside of Red List training.*

Range:

This ray species occurs off Santa Catarina, southern Brazil. It has a very localised and restricted distribution (see Figure 1). Numerous surveys have been carried out since the early 1980s covering areas of similar habitat from as far south as Buenos Aires (Argentina) and north to Rio Grande do Norte (Brazil) and the species has not been recorded outside of its current known distribution area. Actual area occupied by the species is likely to be much smaller than the full extent of its range shown in Figure 1.

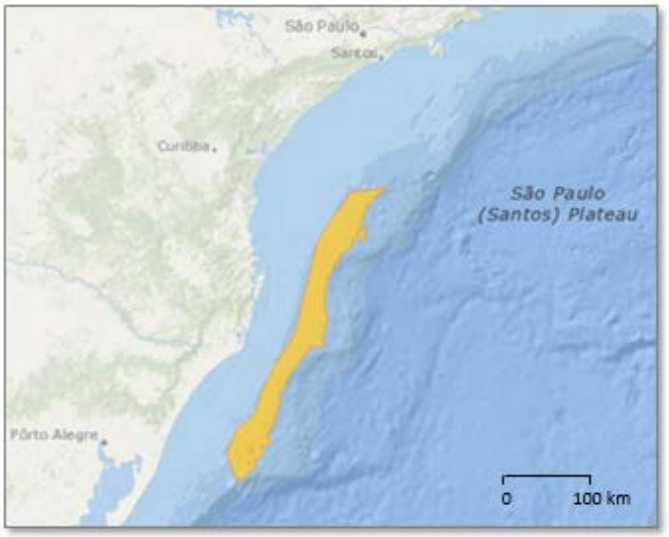

Figure 1. Distribution including known, inferred and projected sites of occurrence.

Population:

Since the species is not known to be targeted by any fishery, there are no fisheries data available for this species. However, it is caught and discarded as bycatch in squid fisheries. The species tends to congregate in small areas and large numbers can be captured in a single trawl. Interviews with local fishermen were carried out 5 years ago, specifically asking about occurrence of this species in bycatch. Many of the interviewees indicated that fewer of these rays were being caught than were being caught in the same fishing grounds ten years previously; many estimated seeing about half the number they saw a decade previously.

Habitat & Ecology:

This is a deepwater ray occurring at 400-600 m depth in bottom water temperatures of 8-9°C. It aggregates over polychaete-rich sediments where it feeds mainly on polychaetes and isopod crustaceans which it unearths from the sediment. There are 4-5 main feeding areas where large groups are currently known to feed.

It grows to a maximum size of around 26 cm total length (TL). Maturity is reached around 14-15 cm TL (males) and 20-21 cm TL (females). Size at birth is 0.96 cm TL. The species is ovoviviparous, producing only 1-2 young per litter. Gestation time and reproductive periodicity is not known. However, since this is a deepwater species and produces very few embryos per litter, it is likely to have a low intrinsic rate of increase and poor resilience to any serious population declines.

It has a relatively thin skin which is sensitive to injury.

Use and Trade:

The species is not known to be targeted by any fisheries at present. However, it is captured in large numbers as bycatch by otter trawl fisheries targeting squid.

Threats:

Squid fisheries, which operate separately across the known feeding grounds of this species, pose the most serious threat. This fishery has been operating within the ray's distribution area for the last 20 years, and bottom trawl effort for squid in this area is now on the increase.

As a deepwater species that is likely to have low resilience to depletion, the large numbers that are regularly captured as bycatch is a concern. The species is of no commercial importance and bycaught animals are often returned to the sea, however survival rates of these returned animals is not known. It is a thin-skinned fish and can easily be injured by trawlers.

Trawl gear is also known to cause temporary changes to the benthos, including scraping and ploughing of the sediment, sediment resuspension, and vertical redistribution of sediment layers. Studies in other regions have shown that repeated churning up of soft bottom areas can create anaerobic turbid conditions capable of killing larvae of marine invertebrates. Increased bottom trawling could potentially cause permanent changes to the sediment which may in turn affect food availability for this ray.

Conservation Measures:

Currently there are no conservation measures in place for this species. Since it congregates in certain areas to feed, closing these areas to bottom trawl fisheries may be effective to protect these congregations. The use of bycatch reduction devices seems to be ineffective since the animal is sensitive to injury.

There is an urgent need for research into the species' population status, trends, habitat status, the effects of increased levels of trawling in the area, and a better understanding of its biology and ecological requirements would also help develop appropriate conservation measures to put in place for this species.