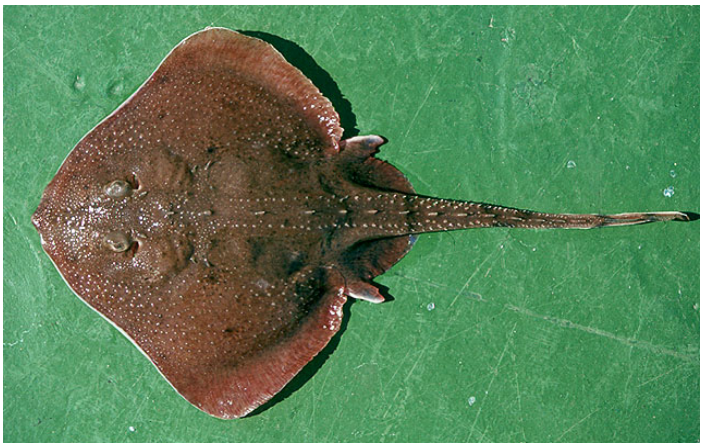
Species of Concern
NOAA National Marine Fisheries Service

Thorny skate
Amblyraja radiata



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KEY INFORMATION

Areas of Concern
West Greenland, Hudson Bay, Atlantic coast of Labrador, east and south coasts of Newfoundland, Grand Banks, Gulf of St. Lawrence and outer coast of Nova Scotia, to the Gulf of Maine, and westward and southward along the continental shelf to New York; may stray to South Carolina.

Year Identified as "Species of Concern"
2004

Factors for Decline
- Commercial fishing (trawling)
- Bycatch (groundfishing)
- Predation
- Competition

Conservation Designations
IUCN: Not Evaluated
American Fisheries Society: Vulnerable

Current Status

Demographic and Genetic Diversity Concerns:
No genetic work has been completed for thorny skate, but the continuous distribution, lack of physical barriers on the Grand Banks, lack of morphometric variation, and a synchronous migration indicate that the **stock** found predominantly in the Grand Banks region represents a single reproductive population (Kulka et al. 2006). It is possible that this may represent a transboundary stock that may require conservation measures in the U.S. and Canada.

The NEFSC survey abundance indices for thorny skate have declined over the last 30 years. Peak abundance and biomass from NEFSC spring and autumn surveys were during the early 1970s (NEFSC 2000) and abundance has declined steadily since the late 1970s, reaching historically low values in 1998 and 1999, which are only 10 to 15% of the 1970s peak observed in the 1970s (New England Fishery Management Council (NEFMC) 2001).

There has also been a downward trend in median length of survey catch through most of the survey time series, but median length has been recently increasing in autumn surveys, and is currently 16 to 20 inches (NEFMC 2001). Kulka et al. (2006) report that the area occupied by thorny skate on the Grand Banks has continued to decline and the density has continued to increase at the center of the mass of the species. They note that for other species, such hyper-aggregation has been a precursor to collapse.

Currently, there are insufficient data on age and growth to determine fishing mortality rates. Three-year averages of the autumn biomass indices are used to evaluate the current status with respect to the biomass reference points. The 2003-2005 NEFSC autumn survey indicates an **overfished** condition but **overfishing** is not occurring (NEFSC 2007). However, the 2005 index represents a record low for the entire forty year time series.

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Existing Protections and Conservation Actions:

The northeast skate complex Fishery Management Plan was enacted in 2003 in federal waters from Maine to Cape Hatteras, North Carolina, and includes measures requiring permits, species-specific data, a prohibition on possession of thorny (and barndoor) skate, a rebuilding program, and a baseline of management measures in other fisheries that benefit skates. In 2004, parties to the Northwest Atlantic Fisheries Organization agreed to establish a total allowable catch (TAC) for thorny skates in Canadian and international waters around the Grand Bank.

Data Deficiencies:

Available data suggest that the Grand Banks stock represents a single breeding unit; however, stock structure has not been confirmed. Information is also needed on age validation and growth in this species. The trophic interactions between skates and other groundfish should be investigated.

Brief Species Description:

The thorny skate is one of seven skates that occur off the northeastern coast of North America from Labrador to South Carolina. This species is characterized by a row of 11 to 19 large thorns running down the midline of the back and tail. Thorny skate are generally brown dorsally with a white ventral surface. They may reach lengths of over 39 inches (1 m) TL, but maximum size varies over its range. They are most abundant in the Gulf of Maine and Georges Bank offshore strata regions, with very few fish caught in inshore, Southern New England, or Mid-Atlantic regions. Thorny skates are found over a wide variety of substrates including sand, broken shell, gravel, pebbles and soft mud and are primarily found from 20 to 3900 feet (18-1200 m) deep (Collette and Klein-MacPhee 2002). They appear to make seasonal migrations, which have been noted on the Scotian Shelf and the Grand Banks, but specific details on the spatial patterns and timing are lacking (NEFSC 2003).

Females deposit a single fertilized egg capsule which ranges in size from 2 to 4 inches (48 to 96 mm) in length. Females with fully formed egg capsules are captured year round, but the percentage of mature females with capsules is highest during the summer (Collette and Klein-MacPhee, 2002). Under lab conditions, embryo development lasted for 2 to 2.5 years while in the low temperature environment of the Barents Sea, development took 2.5 to 3 years (NEFSC 2003). Larger fish over 24 inches (>60 cm) TL feed primarily on squid and fish such as herring, redfish, sculpins, wolffish, mackerel, sand lance and flatfish, while smaller skates 8 to 24 inches (20-60 cm) TL feed mostly on worms, euphausiids, and decapods (Collette and Klein-MacPhee 2002).

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