

## **Investigations of a Skate Nursery Area in the Eastern Bering Sea (F0415)**

**Dr. Gerald Hoff (NOAA)**

### ***WHAT IS A SKATE?***

In general skates are closely related to sharks and rays. They have a large pectoral fin attached to their head and their body that undulates and makes them appear as if they are flying through the water. Like sharks and rays, skates deposit eggs on the ocean floor. The eggs are often referred to as mermaid purses. In the eastern Bering Sea, skates are the largest biomass of non-commercial fish species and their populations are continuing to increase. Skates are characterized as slow-growing fish that are late to mature, long-lived, and have small brood sizes which makes them vulnerable to over-fishing.



Most people do not even know what a skate is, so it should be no surprise that little is known about the life history of Skates in the North Pacific and Bering Sea. Biologist Dr. Gerald Hoff of the National Marine Fisheries Service is studying a potential skate nursery area in the eastern Bering Sea to learn more about skate species and help develop effective fishery management plans.

### ***ARE SKATES OVER-FISHED?***

Fisheries management is being developed at the species level for skates in the North Pacific. Recently the Alaska fisheries skates were managed as one group with other fish and invertebrate species including sculpins and squid. The removal of adult skates, food resources, and disturbance of essential nursery habitat could greatly affect the reproductive cycles and population numbers of Bering Sea skates. In May, 2004 the Fishery Management Plan for The Gulf of Alaska moved skates to a target species list. Skates have become a targeted species in the Gulf of Alaska on a limited basis and there has only been incidental take of skates in the Eastern Bering Sea as bycatch. Understanding the reproduction and population growth for the eastern Bering Sea skates will be critical in the long term management of the species.



### ***WHERE DO SKATES LAY EGGS?***

Fishery data suggests there is an area in the southeastern Bering Sea used by skates for depositing egg cases. The existence of a specific location used as a nursery would indicate a reproductive migration, perhaps seasonally to a specific area, creating a vulnerable period for reproductive adults and disturbance to the nursery. Disturbances to the area could include heavy bottom fishing pressure on the mature population of skates in the area, as well as interruption of habitat structure that may be important to skate egg attachment, egg protection and egg/brood development

### ***THE PROJECT:***

Further investigation of this potential skate nursery habitat will provide the information needed for effective fisheries management. Researchers are: determining what type of skates and other animals are found in the nursery area estimating the number of skate eggs and spawning adult skate populations, describing the habitat structure associated with egg deposition, evaluating non-skate species interactions with skates in a nursery area, and assessing the interactions between the skates and the commercial fishery in the nursery area.

This research addresses the hypothesis that there exists a distinct nursery habitat in a heavily fished area of the southeastern Bering Sea that can be characterized using trawl and video camera equipment. In July and September of 2004 biologists from The Alaska Fisheries Science Center trawled the designated area in the eastern Bering Sea in an attempt identify distinct skate nursery habitat. To describe the habitat thoroughly, researchers: recorded the location of the trawl, identified which species of fish and invertebrates were caught in the trawl, the amount of time and depth of the tow, the bottom and surface temperatures, and speed and direction of the tow. Measurements on all skate species caught and egg case measurements were taken along with other biological data including: sex, weight, stomach content, and maturity. In addition researchers analyzed all predator species caught within the area for evidence of predation on skate egg cases, embryos or newly hatched skates.



Photo by Jerry Hoff/NMFS

The North Pacific Research Board seeks to build a clear understanding of the North Pacific, Bering Sea, and Arctic Ocean ecosystems to enable effective fisheries management and the sustainable use of marine resources. [www.nprb.org](http://www.nprb.org)

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