

U.S. Catches, Eats Record Amounts of Fish and Shellfish

Americans ate a record amount of seafood for the fourth consecutive year in 1987, consuming 15.4 pounds per person and breaking the 1986 record of 14.7 pounds, according to the National Oceanic and Atmospheric Administration's National Marine Fisheries Service. Some 3.7 billion pounds of edible fish and shellfish were consumed by the civilian population. A record consumption of fresh and frozen fish, primarily shrimp, along with a near-record consumption of canned fish, mostly tuna, helped boost the per capita figure, the Commerce Department agency said.

According to NMFS marketing experts, a trend of steadily increasing fish and shellfish consumption since the 1970's, and news that eating fish may help prevent heart disease and other ailments has helped seafood consumption. Improved marketing of quality fresh and frozen fish by air to Midwestern cities was another factor in the increase. The NMFS said Americans are also taking advantage of increased availability of seafood at restaurants and supermarkets, and the appearance of nontraditional species, such as farm-raised catfish and walleye (Alaska) pollock, along with tuna and surimi-based products. The domestic figures reflect the consumption of edible meat, rather than the weight of the whole fish, NOAA said.

Record Landings

Meanwhile, U.S. fishermen landed a record 6.9 billion pounds of fish and shellfish in 1987, valued at \$3.1 billion. The new figure breaks the 1980 record of 6.5 billion pounds. Last year's landings rose just over 865 million pounds from the 1986 total of 6 billion pounds, worth \$2.8 billion. Fishermen received an average of 45 cents a pound for their fish last year.

Harvests by American fishermen, who landed their catches at ports outside the 50 states or sold their fish at sea in joint venture operations, were an additional 4.1 billion pounds, worth \$454 million—an increase in both volume and value from 1986. The NMFS said that increased catches of menhaden at 2.7 billion pounds, followed by

Alaska or walleye pollock, at 552 million pounds, were primarily responsible for the new record. Pollock rose 323 percent from 1986, more than ten times higher than the 5-year average of 50.7 million pounds. Landings of tuna, Pacific cod, crabs, and scallops also helped boost the figure. Shrimp landings fell to 363.1 million pounds valued at \$578.1 million dollars last year from 400.2 million pounds worth \$662.7 million in 1986—a decrease of 37 million pounds and \$84.7 million dollars.

Top States

Louisiana led all states in volume with landings of 1.8 billion pounds, followed by Alaska, 1.7 billion pounds; Virginia, 709.6 million pounds; California, 451.7 million pounds; and Mississippi, 436.7



million pounds. Alaska led all states in fish value with \$941.7 million, followed by Louisiana, \$315.9 million; Massachusetts, \$278.9 million; Texas, \$199.7 million and California, \$173.2 million. World commercial fishery landings were a record at 203.3 billion pounds with Japan continuing to be the leading nation with 13 percent of the total world catch. The Soviet Union was second with 12 percent, followed by China at nine percent, Peru and Chile each with 6 percent and the United States with 5 percent. World commercial fishery landings are based on 1986 data from by the United Nation's Food and Agriculture Organization.

Record Exports

Meanwhile, U.S. fishery exports have been setting a record pace, according to NMFS statistics. Last year (1987), the value of edible fish imports was at its highest ever—\$57 billion, while exports also set a record, with U.S. businesses selling \$1.6 billion worth of seafood to overseas markets. That represented an increase of almost 48 million pounds in volume and more than \$290 million in value over the 1986 figures.

Trade figures for the first 4 months of 1988 indicate sales of about \$478

million, a remarkable jump of 48 percent over the same period in 1987. By contrast, fishery imports grew only 4 percent in value in the first 4 months of 1988 compared to the same period in 1987, suggesting that the trade imbalance in fishery products, while still large, is narrowing.

Leading U.S. Ports

New Bedford, Mass., led all other U.S. cities with a record value of fish landings in 1987 and Cameron, La., topped all others in the volume of its catch, according to NMFS data. New Bedford led with more than \$143 million worth of fish and shellfish landed, up substantially from \$106 million in 1986. Scallops accounted for nearly half of the total dollar value, even though they made up only 21 percent of the total fish landed. Cameron, as in the past 10 years, led in volume, with 672 million pounds of fish landed. Most were low-value but industrially important menhaden.

Other shifts include a rise in fish value and quantity for Dutch Harbor-Unalaska and Kodiak, Alaska, from increased landings of walleye pollock, Pacific cod, plaice, and sole, mostly used in Alaskan processing plants to

produce fillets and surimi. Hampton Roads, Va., made substantial gains from higher prices and landings for fluke and increased volume in scallops. The 10 leading U.S. ports in volume of fish and shellfish landed in 1987 (in millions of pounds), with 1986 figures for comparison:

| Port | 1987 | 1986 |
|-------------------------------|-------|-------|
| Cameron, La. | 672.4 | 616.8 |
| Pascagoula-Moss Point, Miss. | 391.6 | 365.5 |
| Empire-Venice, La. | 357.4 | 317.6 |
| Dulac-Chauvin, La. | 331.7 | 294.6 |
| International City, La. | 314.3 | 298.9 |
| Kodiak, Alaska | 204.1 | 141.2 |
| Los Angeles, Calif. | 203.1 | 187.4 |
| Dutch Harbor-Unalaska, Alaska | 128.2 | 88.3 |
| Gloucester, Mass. | 93.0 | 110.0 |
| Beaufort-Morehead City, N.C. | 85.7 | 98.9 |

The ten leading U.S. ports in value of fish and shellfish landed in 1987 (in million of dollars), with 1986 figures for comparison:

| Port | 1987 | 1986 |
|--------------------------------|-------|-------|
| New Bedford, Mass. | 143.7 | 106.0 |
| Kodiak, Alaska | 132.1 | 89.8 |
| Dulac-Chauvin, La. | 65.6 | 71.0 |
| Dutch Harbor-Unalaska, Alaska | 62.7 | 37.2 |
| Empire-Venice, La. | 60.1 | 47.1 |
| Los Angeles, Calif. | 55.6 | 29.5 |
| Brownsville-Port Isabel, Texas | 54.2 | 69.3 |
| Hampton Roads Areas, Va. | 46.2 | 23.6 |
| Cordova, Alaska | 41.9 | N/A |
| Petersburg, Alaska | 36.9 | 38.1 |

New England Fish Harvest Value Is Up, Weight Down

Preliminary figures for commercial landings of New England fish and shellfish during 1987 were 543.7 mil-

lion pounds, valued at 512.6 million dollars. These 1987 figures are down 12.0 million pounds and up 63.7 million dollars from the 1986 figures, according to Allen E. Peterson, Jr., Science and Research Director of the

National Marine Fisheries Service's Northeast Region.

Table 1.—Preliminary weights¹ and values of fish and shellfish landings in New England on a state-by-state basis for 1986 and 1987.

| State | 1986 | | 1987 | |
|---------------|----------------|-----------------|----------------|-----------------|
| | Million pounds | Million dollars | Million pounds | Million dollars |
| Massachusetts | 271.3 | 243.6 | 256.8 | 278.9 |
| Maine | 168.2 | 108.4 | 169.0 | 132.4 |
| Rhode Island | 101.6 | 75.1 | 100.0 | 77.5 |
| New Hampshire | 7.9 | 6.2 | 9.3 | 7.8 |
| Connecticut | 6.7 | 15.6 | 8.6 | 16.0 |
| Totals | 555.7 | 448.9 | 543.7 | 512.6 |

¹Landings of fish, lobster, and crab in live weight; landings of other shellfish in meat weight.

Table 2.—Preliminary weights¹ and values of fish and shellfish landings in New England on a port-by-port basis for 1986 and 1987.

| Port | 1986 | | 1987 | |
|-----------------|----------------|-----------------|----------------|-----------------|
| | Million pounds | Million dollars | Million pounds | Million dollars |
| Gloucester, MA | 109.6 | 37.8 | 92.6 | 34.0 |
| New Bedford, MA | 90.6 | 103.2 | 78.5 | 143.7 |
| Pt. Judith, RI | 56.8 | 28.0 | 46.5 | 29.6 |
| Portland, ME | 34.3 | 22.4 | 43.4 | 35.6 |
| Rockland, ME | 42.7 | 9.1 | 38.6 | 8.1 |
| Boaston, MA | 30.7 | 19.0 | 22.5 | 17.0 |
| Newport, RI | 16.8 | 13.3 | 11.8 | 12.6 |

¹Landings of fish, lobster, and crab in live weight; landings of other shellfish in meat weight.

Table 3.—Preliminary weights¹ and values of fish and shellfish landings in New England on a species-by-species basis for 1986 and 1987.

| Species | 1986 | | 1987 | |
|---------------------|----------------|-----------------|----------------|-----------------|
| | Million pounds | Million dollars | Million pounds | Million dollars |
| Atlantic herring | 70.4 | 3.8 | 84.5 | 4.4 |
| Atlantic cod | 60.8 | 35.6 | 58.4 | 43.7 |
| Pollock | 54.4 | 14.0 | 44.6 | 17.8 |
| American lobster | 43.3 | 112.2 | 42.8 | 124.7 |
| Silver hake | 34.4 | 5.9 | 25.9 | 7.3 |
| Winter flounder | 16.3 | 16.8 | 18.4 | 22.7 |
| Sea scallop | 11.4 | 60.1 | 18.2 | 80.6 |
| Yellowtail flounder | 22.2 | 20.5 | 16.4 | 18.7 |
| White hake | 14.6 | 4.9 | 11.7 | 5.2 |
| Northern shrimp | 10.3 | 6.5 | 11.1 | 12.2 |
| Summer fl. (fluke) | 10.0 | 13.1 | 8.7 | 14.3 |
| Scup | 8.0 | 4.3 | 7.8 | 5.1 |
| Swordfish | 2.2 | 7.0 | 7.7 | 8.6 |
| Haddock | 10.9 | 10.9 | 6.6 | 8.5 |

¹Landings of fish, lobster, and crab in live weight; landings of other shellfish in meat weight.

Table 4.—Preliminary weights (live) and values of American lobster landings in New England on a state-by-state basis for 1986 and 1987.

| State | 1986 | | 1987 | |
|---------------|----------------|-----------------|----------------|-----------------|
| | Million pounds | Million dollars | Million pounds | Million dollars |
| Maine | 19.7 | 46.2 | 19.8 | 54.6 |
| Massachusetts | 15.0 | 41.0 | 15.0 | 43.8 |
| Rhode Island | 5.1 | 16.7 | 5.3 | 17.8 |
| Connecticut | 1.8 | 5.4 | 1.6 | 5.3 |
| New Hampshire | 1.1 | 2.8 | 1.1 | 3.2 |
| Totals | 42.7 | 112.1 | 42.8 | 124.7 |

Landings of such traditionally important groundfishes as cod, haddock, and yellowtail flounder decreased by 12.0 million pounds in 1987 compared with 1986, continuing a multiyear decline in the landings of those species. Peterson sees "no change in this trend" for 1988. Landings of sea scallops increased by 6.8 million pounds and 20.5 million dollars in 1987 compared to 1986, to reach an all-time high of 18.2 million pounds and 80.6 million dollars.

Tables 1-3 compare the weights and values of New England landings in 1986 and 1987 on a state, port, and species basis. Table 4 has also been included on landings of American lobsters in each of the New England states.

Continued Expansion Seen for N.E. Marine Angling

Northeastern U.S. marine anglers will increase in numbers by at least 34 percent by the year 2025, bringing the total to nearly 5 million anglers. That's the prediction of NMFS Northeast Fisheries Center scientists as presented in a talk at the Symposium on Demand and Supply of Sport Fishing, held in Charleston, S.C., earlier this year. The predicted increase comes on the heels of a 200 percent increase in the last 30 years.

The model used by Northeast Fisheries Center scientists to make these predictions relies on projections of population size and the closeness of the population to the shoreline. Future NEFC research will extend the predictions to include specific fisheries (e.g., bluefish, summer flounder) and fishing modes (e.g., charter boat fishing, shore fishing).

Evans Confirmed As NOAA Administrator, IWC Commissioner

Williams E. Evans was sworn into office on Friday, 1 April 1988, as Under Secretary of Commerce for Oceans and Atmosphere, and Administrator of the Commerce Department's National Oceanic and Atmospheric Administration (NOAA). Evans was nominated to his position by President Ronald W. Reagan after a year and a half as NOAA's Assistant Administrator for Fisheries. His nomination was confirmed by the Senate on Thursday, 31 March.

As head of the National Marine Fisheries Service, he was responsible for management and enforcement of fishery resources, and conservation and protection of threatened and endangered marine mammals. He is President Emeritus of the Hubbs Marine Research Institute in San Diego, Calif., and Chairman Emeritus of the U.S. Marine Mammal Commission. He is widely recognized for research on the effects of acoustics on the behavior of marine mammals.

Evans has conducted aerial surveys to collect and evaluate data for stock estimates of dolphins and has done extensive research for the Navy on the dolphin's ability to navigate and adapt to the ocean environment. He has pioneered in use of remote sensing data from satellites for biological oceanography. He has published over 100 scientific articles and chapters in textbooks, is affiliated with numerous professional organizations, and has taught at several major universities. He has received many awards for science and public service. Evans received a Ph.D. in physiology, ecology, biology, and animal behavior from the University of California at Los Angeles, a master's degree from Ohio State University, and a bachelor's degree in education from Bowling Green State University. He is married and the father of two sons.

More recently, Evans has been appointed United States Commissioner on the International Whaling Commission. Evans' appointment to the 41-nation

organization that regulates commercial whaling internationally, was announced by the White House on 25 May.

As administrator of NOAA, Evans establishes Federal policies and directs programs to improve the understanding, management, conservation, and development of the nation's marine and atmospheric resources for economic and social benefit.

Brennan Heads National Marine Fisheries Service

James W. Brennan, deputy general counsel for the National Oceanic and Atmospheric Administration (NOAA), was named to head the agency's National Marine Fisheries Service in early June. As assistant administrator for fisheries in the Commerce Department agency, Brennan will be responsible for management of fishery resources in the Nation's 200-mile Exclusive Economic Zone, and protection of threatened and endangered marine animals.

Brennan has been with NOAA's Office of General Counsel since 1971. Before that he worked at the Commerce Department's Patent Office and the Office of Naval Research. He holds a B.S. in chemical engineering from the University of Rochester and a law degree from Georgetown Law Center. He has done post-graduate legal studies at the University of Frankfurt in West Germany. He is married with six children and lives in Vienna, Virginia.

Boehlert Named to Head NMFS Honolulu Laboratory

George W. Boehlert, 38, has been selected as the new director of the National Marine Fisheries Service laboratory in Honolulu, Hawaii, reports Izadore Barrett, Science and Research Director of the NMFS Southwest Region. Boehlert has led the fisheries laboratory's research program on the physical and biological interactions in seamount and island ecosystems since 1983. He is the author of many scientific papers on these subjects as well as on the reproduction, ageing, and growth

of fishes, and the physiological responses of fishes to environmental changes.

Before joining the Laboratory staff, Boehlert was an Associate Professor of Oceanography at Oregon State University. He graduated from the University of California, Santa Barbara in 1972 with a Phi Beta Kappa key. He received his Ph.D. in marine biology from the University of California's world-famous Scripps Institution of Oceanography in 1977. He is married to the former Susan Shimp, and they have two sons, Brent and Brooks.

As Director of the Honolulu Laboratory, which started as the Pacific Oceanic Fishery Investigations in 1949, Boehlert leads a group of 80-90 fishery scientists and support staff in conducting research programs throughout the central and western Pacific which range from studies of the biology and habitat of tuna, billfish, bottomfish, lobster and deep-sea shrimp to studies of the endangered Hawaiian monk seal and threatened green sea turtle. Boehlert replaces Richard S. Shomura who stepped down after 15 years as the Director of the Honolulu Laboratory to pursue several fishery-related projects before his planned retirement from federal service in August, 1988.

Peterson Selected As NOAA Chief Scientist

"NOAA is a science organization," stated William E. Evans, Under Secretary of Commerce for Oceans and Atmosphere, as he announced the selection of Melvin N. A. Peterson to fill the new position of NOAA Chief Scientist in April. NOAA, said Evans, has one of the finest groups of scientists in the world, and its mission, he pointed out, is unique in environmental observation, prediction, and supporting research and information management.

The new Chief Scientist can contribute to NOAA's pursuit of its mission in several ways, Evans noted. Internally, he can act to preserve and enhance the excellence of NOAA's science staff and the facilities and resources available to NOAA scientists. Externally, the Chief Scientist can help coordinate and

promote NOAA's programs within the larger research community, Evans said, adding that the Chief Scientist can also be instrumental in identifying and fostering new ways for Federal agencies and other institutions to work together in service to the American people. Prior

to coming to NOAA, Peterson served as Director of the Deep Sea Drilling Program at Scripps Institution of Oceanography, and he draws upon a broad range of research and operational experience, as well as extensive national and international contacts.

Shark Tagging Provides Needed Biological Data

In 1987 a total of 5,760 sharks and teleosts (bony fishes) representing 41 species were tagged under the Cooperative Shark Tagging Program (Table 1). The releases were made by volunteer anglers (54 percent), U.S. Foreign Fisheries Observers (30 percent), commercial fishermen (10 percent) and other biologists (6 percent). NMFS biologists did not tag for the first time in 25 years. Even so, the number of releases last year increased to 750 more than in 1986 with the capture gear about equally divided between longline and rod-and-reel.

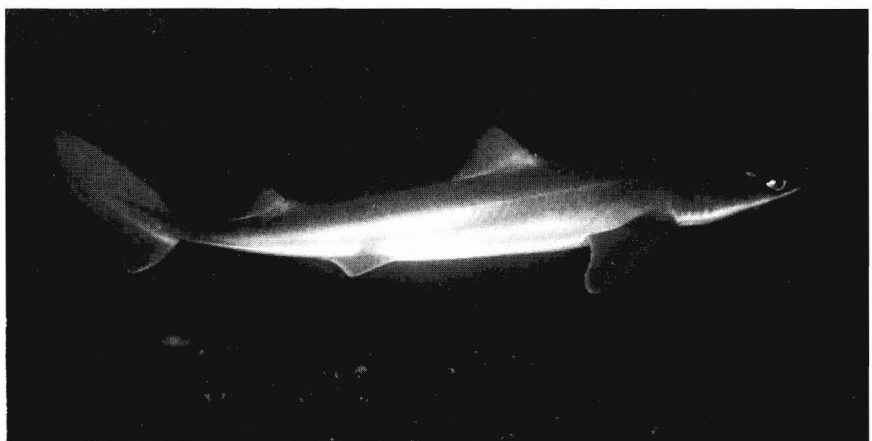
The annual variations in the number of fish tagged (e.g., 3,700+ in 1984 and 7,000+ in 1985) depends on several factors. We expect there are natural cycles of increased and decreased abundance, but almost nothing is known about these cycles with respect to sharks. Actually,

This article was prepared by J. Casey, H. W. Pratt, N. Kohler, and C. Stillwell with the Cooperative Shark Tagging Program, National Marine Fisheries Service, Northeast Fisheries Center, Narragansett, RI 02882.

Table 1.—Summary of sharks and teleosts tagged by cooperative taggers, Jan.-Dec. 1987.

| Species | No. tagged | Species | No. tagged |
|------------------------|------------|-----------------------------|--------------|
| Sharks | | | |
| Blue shark | 2,638 | Bignose shark | 2 |
| Sandbar shark | 632 | Smooth spiny dogfish | 2 |
| Dusky shark | 343 | Spiny dogfish | 2 |
| Tiger shark | 293 | White shark | 1 |
| Shortfin mako | 259 | Carib. sharpnose shark | 1 |
| Lemon shark | 252 | Leopard shark | 1 |
| Atl. sharpnose shark | 206 | Whale shark | 1 |
| Blacktip shark | 189 | Hammerhead unspec. | 48 |
| Porbeagle | 91 | Thresher unspec. | 26 |
| Nurse shark | 91 | Brown/Dusky unspec. | 14 |
| Bigeye thresher | 56 | Blacktip unspec. | 8 |
| Scalloped hammerhead | 51 | Sand unspec. | 8 |
| Sand tiger | 51 | Dogfish unspec. | 4 |
| Blacknose shark | 46 | <i>Carcharhinus</i> unspec. | 4 |
| Basking shark | 33 | Miscellaneous ¹ | 34 |
| Spinner shark | 26 | Subtotal | 5,559 |
| Bull shark | 24 | Teleosts | |
| Reef shark | 23 | Swordfish | 122 |
| Silky shark | 19 | White marlin | 15 |
| Bonnethead | 16 | Blue marlin | 15 |
| Smooth hammerhead | 15 | Sailfish | 3 |
| Longfin mako | 13 | Billfishes | 3 |
| Oceanic whitetip shark | 12 | Bluefin tuna | 2 |
| Great hammerhead | 7 | Longbill spearfish | 1 |
| Greenland shark | 6 | Tuna unspec. | 1 |
| Night shark | 4 | Miscellaneous | 39 |
| Finetooth shark | 4 | Subtotal | 201 |
| Thresher shark | 3 | Grand total | 5,760 |

Spiny dogfish. Photo by William High.



the total number of sharks tagged in a particular year is related more to fishing activities than to changes in abundance. For example, NMFS biologists may have one or two research cruises in some years and none in others. The number of fish tagged by U.S. Fisheries Observers aboard foreign vessels depends largely on the number of foreign vessels permitted in that fishery. Last year more sharks were tagged by southern commercial shark fishermen in that expanding fishery. Considering only the number of sharks tagged by anglers in the past 10 years, the number of releases has declined slightly despite an increase in the number of participants. But even in that category annual trends must be interpreted with caution.

The number of sharks tagged by anglers is influenced by a variety of factors from weekend weather conditions, changes in the distribution of common sharks in some years, increased utilization of sharks for food, an increase in shark fishing tournaments, and a shift in fishing effort by some of our most expert taggers to other species such as tunas. As a consequence of these and other variables, the total number of sharks tagged has limitations as a measure of population abundance. On the other hand, tagging data is vital to the understanding of shark migrations, age, and growth; distribution, seasonal occurrence, and other aspects of their biology.

A total of 210 tags from 19 species were returned in 1987. Recaptures came from anglers (40 percent), U.S. commercial fishermen (33 percent), foreign fishermen (21 percent), U.S. Foreign Fisheries Observers on foreign vessels (3 percent), and other biologists (3 percent). Tags were returned from the following 14 countries and island territories: United States, 149; Japan, 14; Mexico, 12; Spain, 10; Canada, 7; Cuba, 5; Columbia, 3; Taiwan, 2; Portugal, 2; Bermuda, 2; Bahamas, 1; St. Martin, 1; Barbados, 1; and Canary Islands, 1. Sharks recaptured in 1987 had originally been tagged by anglers (60 percent), U.S. Foreign Fisheries Observers (17 percent), NMFS and other biologists (16 percent), and U.S. commercial fishermen (7 percent).

Blue sharks provided 69 returns. The maximum time at liberty for a blue shark was 6.0 years and the maximum distance travelled was 3,251 miles. While some blues were recaptured near the release site after 4 years at liberty, others travelled considerable distances in a relatively short time (e.g., 546 miles in 39 days or 14 miles per day). Long-distance movements by blues tagged off the U.S. coast included 6 recaptures from Canada, 3 from Azores, 3 from Colombia, 2 from Portugal, 2 from Cuba, and 1 from the West Indies. Some returns from Spanish longliners came from areas between the Azores and the Grand Banks that are fished by American, Canadian, and Japanese vessels. In recent years, the eastward expansion of the U.S. and the westward expansion of the Spanish longline fishery is evidence that several nations have the capability to target highly pelagic species anywhere in the Atlantic. One would expect that sharks will be increasingly important to these fisheries, perhaps in the not too distant future.

Sandbar sharks provided 44 returns. The maximum time at liberty for a sandbar shark was 21.8 years and the maximum distance travelled was 1,945 miles. This is the longest time at liberty for any shark tagged under the program. Eight of the recaptures had been tagged by NMFS biologists aboard the Polish research vessel *Wieczno* during the 1986 longline survey conducted between New England and southern Florida. A total of 264 sandbar sharks were tagged on that cruise and the eight recaptures ranged in distance from 4 to 1,100 miles over a 9.7-month period. Other sandbar recaptures demonstrated movements from the northeastern United States into the Gulf of Mexico. The predominantly north to south pattern shown by tagged sandbar sharks is in part explained by the larger number tagged off the northeast coast. Additional tagging off Florida and in the Gulf of Mexico, including the coast of Mexico, is needed to determine if sandbar sharks commonly return north from these areas.

In recent years, commercial shark fishing off Florida has been expanding. Thirty-one (70 percent) of the 1987

returns from sandbar sharks came from longline vessels fishing off Florida or Mexico. Fortunately, some U.S. commercial shark fishermen are also avid taggers, and have provided data and vertebrae from tagged sharks for age studies. Fishermen who know about sharks also know that the stocks are highly susceptible to intensive fishing. Both recreational and commercial interests are concerned that populations of some sharks will be seriously impacted by increased fishing. This concern is justified based on the past history of shark fisheries throughout the world. The sandbar shark was the most abundant species in the U.S. commercial shark fishery along the Atlantic Coast during the 1940's.

Mako sharks provided 19 returns. The maximum time at liberty for a mako was 4.0 years and the maximum distance travelled was 1,412 miles. The distance between tag and recapture exceeded 1,200 miles for six (32 percent) of the returns. Three makos tagged in the Mid-Atlantic Bight (i.e., between Cape Hatteras and Cape Cod) were recaptured about 600 miles east of the Grand Banks by Spanish longliners. Two additional makos tagged in the Mid-Atlantic Bight were recaptured near Cuba. Last year we also had the first recapture of a mako shark showing movement into the Gulf of Maine. The expanding recreational shark fishery in the Gulf of Maine may reveal a higher abundance of sharks than indicated by the low numbers of tag returns from that area.

Tiger sharks provided 12 returns. The maximum time at liberty for a tiger shark was 5.5 years and the maximum distance travelled was 1,126 miles. A tiger shark released off Montauk, N.Y., and recaptured off Cuba is the third to show movements of this species between the United States and Cuba. Of the long-distance returns (i.e., over 700 miles), three tiger sharks showed southward movements from New York and New Jersey to Florida and Cuba, and one travelled northward from Florida to New York. The fastest rate of travel was 15.1 miles per day for an individual tagged off New York in late July and recaptured off Florida in September. These long-distance north-south move-

ments of tiger sharks are interesting in that it was not too long ago that tiger sharks taken north of Cape Hatteras were thought to be tropical strays. Four of the recaptures were at liberty for over 3 years and their vertebrae would have been valuable for age studies. Fishermen are urged to make every attempt to collect vertebrae from any tagged shark recaptured.

Tag returns from other species included: Scalloped hammerheads that were at liberty for up to 9.6 years, and a maximum distance of 765 miles (both records for this species); blacktip sharks that were at liberty for up to 7 years, and a maximum distance travelled of 1,159 miles between North Carolina and the

Gulf of Mexico (both records for this species); dusky sharks that were at liberty for up to 11.8 years (a new record for this species) and a maximum distance travelled of 1,385 miles (three dusky recaptures showed movements from the U.S. east coast to Mexico); nightsharks that were at liberty for up to 8.8 years and a maximum distance travelled of 1,441 miles between Maryland and Mexico (a new distance record and second evidence of movement of this species between the two countries); and reef sharks recaptured at the same location off Bermuda after 1.2 and 2.2 years that were retagged and are still at liberty. Returns from lemon, nurse, and other sharks were primarily local recap-

tures that provided early life history information on young sharks that were still on inshore nursery grounds.

Tags were also returned from five swordfish, including one at liberty for 7.6 years. One swordfish recaptured in 1987 is the first to demonstrate movements of swordfish from the offings of the Grand Banks to the Virgin Islands. (In March 1988 we received another swordfish return showing movement from Georges Bank to Haiti.) Recaptures from two additional swordfish tagged off Georges Bank included one from the Grand Banks and one from the Straits of Florida.

Tag and Recapture Update

In the first five months of 1988, a total of 1,000 sharks representing 27 species were tagged under the Cooperative Shark Tagging Program. The major species tagged were: Blue sharks released by U.S. Foreign Fisheries Observers aboard Japanese tuna longliners fishing off Georges Bank and the Middle Atlantic Bight; sandbar sharks and tiger sharks released by U.S. commercial shark longliners off eastern Florida and in the Gulf of Mexico.

An important aspect of this spring's tagging was that one commercial longliner tagged over 250 nearly full term sandbar shark embryos. The survival rate of embryos taken from pregnant sharks and returned to the sea is not known and is a difficult problem to study. The efforts of fishermen in tagging embryos can provide vital information. In the past 23 years, we have only had about 30 embryos tagged. The opportunities to do so are very limited. The only first hand information we can offer on this subject is that several years ago, one of our commercial longliners tagged several dusky shark embryos taken from a pregnant female in the Gulf of Mexico and one was recaptured after 25 days. Our advice regarding tagging has always been that sharks of all sizes are susceptible to internal injuries during capture and should be treated gent-

ly to insure maximum survival. However, when in doubt, release them and give them a chance. We have had recaptures from sharks that were considered in poor condition when they were released.

From January through May, a total of 51 tags were returned from 12 shark species including blue (17), sandbar (13), tiger (5), dusky (3), mako (2), and others (11). Blue sharks were at liberty for up to 3 years with eight returns showing long-distance movements of 1,200-2,500 miles. Recaptures from blue sharks tagged off the northeastern U.S. included one return from off Madeira Island in the eastern Atlantic and several returns from off the West Indies and South America. Nearly all of the tagged sandbar sharks were free for over 1 year and included recaptures after 7, 10, and 23 years (the maximum time at liberty to date). Seven of the thirteen sandbar sharks travelled over 1,200 miles, mainly from New York and New Jersey, into the Gulf of Mexico. Most of the tiger shark returns were short term recaptures although one was recaptured after 2.5 years and showed an 800-mile movement from New England to Florida. Three tagged tiger sharks were caught and released with the tags still in place.

Other interesting returns included a tagged dusky shark that travelled from off Alabama to Mexico in 7 months; a

bignose shark tagged off Maryland and recaptured off Alabama after 3 years (evidence that this species moves between the Atlantic and Gulf of Mexico); and a porbeagle shark tagged off the Flemish Cap and recaptured 300 miles west of the tagging site after 4 years. We also had two tag returns from swordfish—both were released off New England. One was recaptured off Florida after 2.5 years; the other, taken off Haiti, travelled 1,250 miles in 57 days (22 miles/day). In addition to the above information, we were fortunate to receive vertebrae from several recaptured sharks and some very valuable growth information from sharks that had been measured both at tag and recapture.

Jack Casey

Shark Tagging Studies

Shark tagging programs throughout the world have been directed toward several objectives, including studies of migrations, age and growth, physiology, population dynamics, and swimming behavior in the open sea. Tagging studies on sharks have been conducted by researchers from Australia, Canada, Great Britain, Greenland, Ireland, Norway, South Africa, South America, Japan, and the United States.

Results of these studies include recaptures from tagged Australian school sharks over a 30-year-period, recaptures from sandbar sharks and spiny dogfish after 20 years, and recapture of a Greenland shark after 16 years. Acoustic telemetry has been used to measure average swimming speeds, diurnal movements, depth ranges and other aspects of the behavior of several species including lemon, reef, blacktip, hammerhead, and blue sharks.

The most extensive shark tagging program in the world has been conducted by the National Marine Fisheries Service in the North Atlantic Ocean. This continuing study, covering 25 years, currently involves over 3,000 volunteer fishermen and scientists along the North American and European coasts. Under this program 67,607 sharks representing 43 species were tagged between 1962 and 1986. In the same period 2,337 sharks of 30 species were recaptured by fishermen representing 24 countries. Results of the U.S. program include: Transatlantic movements of the blue sharks between North America, Europe, Africa, and South America (maximum distance = 3,740 miles), recaptures from sandbar sharks showing movements between the United States, Cuba, and Mexico; recaptures of 10 shark species demonstrating movements between the Atlantic and the Gulf of Mexico, and recaptures of night, blacktip, tiger, bigeye thresher, sandbar, and dusky sharks between North America and the West Indies.

J. G. Casey and N. E. Kohler

Monk Seal Pups Get Honolulu Head Start

Two Hawaiian monk seal pups from French Frigate Shoals are getting a new lease on life as part of a head start program aimed at enhancing the survival rate of this endangered species. The pups, both small females, were flown to Honolulu, Hawaii, on 13 May 1988, so that they could "fatten up" overwinter while learning the basic principles of eating, according to William G. Gilmar-

tin, program manager of the Marine Mammals and Endangered Species Program of the Honolulu Laboratory of the NMFS Southwest Fisheries Center.

For now, the pups, which are being held at the NMFS tank at Kewalo Basin, must be force fed dead fish so that they eat enough to survive. Next March, they will be flown to Kure Atoll, Northwestern Hawaiian Islands, where the number of monk seals is very low. Once at Kure, the seals will spend 2-4 weeks, learning to forage within the protective confines of a large wire mesh enclosure that spans equal areas of ocean and sand. Only after they are catching live fish and invertebrates and feeding on their own will they be released.

"All the pups brought to Honolulu as part of the head start program have been very small and probably wouldn't have survived if left in the wild," said Gilmartin. Some pups have problems more serious than simply being small, problems such as congenital diseases or deformities that are life threatening. Before the seals are reintroduced to the wild, they are carefully screened for disease and genetic problems.

A congenital problem may be why a third pup that arrived in Honolulu on Friday died that same night. Gilmartin and NMFS biologist Doris J. Alcorn performed a necropsy on the animal, but the results will not be available for a few weeks, so cause of death is unknown. "If there is not a congenital problem, the chance of survival for the rehabilitated pups increases from less than 40 percent to nearly 100 percent. There's no reason to gamble by leaving undersized pups to overwinter at French Frigate Shoals," said Gilmartin, adding that "Of the nine pups successfully treated and released since 1985, all are still alive." Friday's airlift was made possible by the Captain Bob Justman, who volunteered his time to fly to French Frigate Shoals to pick up the pups and deliver them to Honolulu.

Introducing just a few females each year is a significant addition to the Kure population: The introduced female pups outnumber the females born at Kure in the past few years. Monk seal births at Kure declined from 30 per year in the

mid-1960's to one in 1986. So far in 1988, the number of Kure births is at seven, the highest number since 10 were born in 1981.

The three undersized pups probably were weaned half way through the normal nursing period of 40 days. In the wild, weaned pups must live off their fat reserves for the next 2-4 months while learning to catch fish on their own. Catching fish is a survival technique their mothers do not teach them. Unfortunately, small pups have less fat and therefore less time to learn. Naturally curious, pups play in the water with fish, invertebrates and whatever else catches their fancy. Eventually, by accident or instinctively, they learn to forage on their own.

A contributing factor for the pups' reduced nursing times is that good pupping habitat is limited at French Frigate Shoals. That problem is compounded by the fact that French Frigate Shoals supports just over half the monk seal population of the Northwestern Hawaiian Islands and that, of the approximately 200 monk seal births in 1987, about half occurred at French Frigate Shoals. Reduced nursing time is also due to monk seals' not being as good as other seal species at recognizing their own pups. As a result, pups may wander away or be displaced by larger pups without the mothers ever noticing.

Another part of the NMFS head start program at Kure Atoll involves weaned Kure females that are placed in the ocean-beach enclosure for protection from sharks and other seals, particularly males. Pups learn to forage on fish and invertebrates that are placed by dip net into the ocean portion of the enclosure while the pups are asleep on the beach. At the end of the field season, usually in September, the pups are released to the wild. As of 1987, 26 of the 27 introduced or Kure-born seals from the head start program are still alive. Some of the older seals from the program are now giving birth, so head start is in its second generation of seals. The U.S. Fish and Wildlife Service assists in collecting the pups and bringing them to Honolulu; the U.S. Coast Guard transports the pups to Kure via a C-130 plane and provides some assistance in collect-

ing live food for the seals at Kure. Volunteers help with the feeding and care of the pups in Honolulu.

1,100 Endangered Turtles Get Head Started in Gulf

About 1,100 yearling sea turtles were released off Padre Island, Tex., on Tuesday, 17 May, as part of a continuing effort to increase their endangered population, the National Oceanic and Atmospheric Administration has announced. With the release of Kemp's ridley sea turtles into the Gulf of Mexico, scientists with NOAA's National Marine Fisheries Service Galveston Laboratory will be completing part of an annual recurring job that began in 1978. Since that year, researchers from the United States and Mexico have been cooperating in an experiment dubbed Operation Head Start, which has reared, tagged, and released more than 13,500 Kemp's ridleys.

Each spring, turtle eggs are collected from the animals' primary nesting beach at Rancho Nuevo, Mexico. From there they are airlifted to Texas' Padre Island National Seashore, where they are incubated. After hatching, the baby turtles are allowed to crawl to the surf as part of the process called imprinting. The turtles are then scooped up in nets, put in boxes and sent to the Fisheries Service laboratory in Galveston, Tex., to be reared for 9-10 months before release. Scientists say the imprinting stage is crucial because they believe it allows the turtles to recognize instinctively where they have nested so that after they have matured they might return and create a new nesting ground at Padre Island.

Protecting the young turtles from predators during their critical first year gives them a much better chance of surviving to maturity, according to Edward F. Klima, director of the Galveston Laboratory. Even though the rearing, tagging, and releasing have been successful, Klima said, it remains to be seen if the turtles will return to nest in the future. He said it can take 10 years or more before the turtles mature.

Over the last nine years, more than 500 head-started turtles have been re-

covered. "We find that the turtles are able to grow and survive in the wild," said Klima. In addition to the Fisheries Service, other organizations involved in the project include the Instituto Nacional de la Pesca in Mexico and the Interior Department and the U.S. Coast Guard. The University of Texas provides the research vessel used in the release. The Texas Parks and Wildlife Department and the Florida Department of Natural Resources have also contributed to the program.

NMFS Outstanding Publications Cited

Winners of the National Marine Fisheries Service's Outstanding Publications Award for papers published in the *Marine Fisheries Review* (vol. 47) and the *Fishery Bulletin* (vol. 84) have been announced by NMFS Publications Advisory Committee Chairman Ben Drucker.

"Starvation-Induced Mortality of Young Sea-Caught Jack Mackerel, *Trachurus symmetricus*, Determined with Histological and Morphological Methods" by Gail Theilacker, was selected as the top paper in the *Fishery Bulletin*, 84:1-17. Theilacker is with the NMFS Southwest Fisheries Center, La Jolla, Calif.

Honored for the best paper published in the *Marine Fisheries Review* was Susumu Kato for "Biology of the Red Sea Urchin, *Strongylocentrotus franciscanus*, and Its Fishery in California," 47(3):1-20. Kato is with the NMFS Southwest Fisheries Center's Tiburon Laboratory, Tiburon, Calif.

Developed in 1975, the annual outstanding publication awards program recognizes NMFS employees who have made exceptional contributions to the knowledge and understanding of the resources, processes, and organisms studied as a part of the NMFS mission. Authors must have been employed by the NMFS at the time the paper was published. *Marine Fisheries Review* papers must be effective and interpretative contributions to the understanding and knowledge of NMFS mission-related studies, while *Fishery Bulletin* papers

must document outstanding scientific work. The Awards Committee is chaired by the editor of the *Fishery Bulletin*, currently Andrew Dizon of the NMFS Southwest Fisheries Center. Other Committee members include the editor of the *Marine Fisheries Review*, W. L. Hobart, and former *Fishery Bulletin* editors Bruce B. Collette, Jay Quast, William J. Richards, and Carl Sindermann.

Maurice Stansby Receives Distinguished Federal Civilian Service Award

Secretary of Commerce C. William Verity presented Maurice E. Stansby of Seattle, Wash., the President's Award for Distinguished Federal Civilian Service at special ceremonies held on 7 March at the Department of Commerce building in Washington, D.C. Stansby was chosen for the award because of his research on the health benefits of fish oil in the human diet. He is the first Department of Commerce employee to receive this award.

Before the benefits of fish oil in the human diet were recognized, Stansby pioneered a fish oil research program in the 1950's while director of the U.S. Fish and Wildlife Service's Technological Laboratory in Seattle. As part of this program, he initiated agreements with the Food Science Department of the University of California, the Hormel Institute, and the University of Minnesota. The results of these research agreements definitely established that fish oil contains certain fatty acids which can reduce cholesterol and triglyceride levels in blood. Stansby has edited several books and published 170 research papers, more than one-third of which deal with fish oils.

Stansby began his Federal fisheries career in 1931 as a chemist with the U.S. Fish and Wildlife Service, Gloucester, Mass. Although he officially retired from government service in 1976, he has continued his work at the NMFS Northwest and Alaska Fisheries Center on a volunteer basis. He has attended meetings, often at his own expense, diligently updated scientific information, and encouraged local conferences and forums

to promote the scientific community's understanding of the benefits of fish oil to human health. One of his more recent contributions is an article on the history of fish oil research to the special historical 50th Anniversary Issue of the *Marine Fisheries Review* (in press).

Peterson Elected NASCO President

Allen E. Peterson, Jr., of Sandwich, Mass., has been named president of the North Atlantic Salmon Conservation Organization (NASCO). Peterson was elected at the June annual meeting of the international organization, which was held in Reykjavik, Iceland. NASCO operates under a 1983 treaty signed by nine parties agreeing to promote conservation, restoration, enhancement, and good management of Atlantic salmon stocks.

Peterson is also science and research director of the National Marine Fisheries Service's Northeast Fisheries Center in Woods Hole, Massachusetts. He will replace Gudmundur Eiriksson of Iceland, who retired at the end of the meeting. Norway's Svein Aage Mehli will serve as NASCO vice president.

Peterson is one of three U.S. commissioners to NASCO. Commissioners Frank E. Carlton of Savannah, Ga., and Richard A. Buck of Dublin, N.H., also attended, along with other government advisors and scientists. Similar delegations were present from the other signatory parties: Canada, Denmark, the European Economic Community, Finland, Iceland, Norway, the Soviet Union, and Sweden.

NASCO is organized geographically, with three commissions covering the Atlantic region and a council. The North American and Northeast Atlantic Commissions have long-term fishery management measures in place, and discussed the effectiveness of these measures, the state of the fisheries, and the scientific advice received on the salmon stocks. The West Greenland Commission negotiated an agreement for regulating total catch during 1988-1990. The agreement sets total catch for the three years at 2,520 metric tons, with catch

in any one year not to exceed the annual average of 840 metric tons by more than 10 percent.

The NASCO council discussed analyses of catch statistics, compilation of salmon tagging data, and a reward program to encourage tag returns. The council also took under advisement reports on threats to wild salmon posed by salmon aquaculture in the North Atlantic and by nonindigenous trout and salmon that may be introduced, imported, or transferred to North Atlantic areas. The next NASCO annual meeting will be held in Edinburgh, Scotland, in June 1989.

NMFS Honolulu Lab Aids Palau Fishery Surveys

"How much fish is being caught and eaten by the residents of Palau?" That's just one of the many questions that will be answered by a project implemented in May 1988 by the Palau Marine Resources Division (PMRD), with assistance from the National Marine Fisheries Service (NMFS).

To survey the fishing activities of Palauans, the Palau Subsistence Fishery Survey Project uses two questionnaires, one for those who own boats and one for those who do not. The questionnaires and survey techniques were designed by Paul Gates, who is the project's principal investigator and also a fisheries biologist with the Western Pacific Regional Fishery Management Council in Honolulu, and David C. Hamm, a computer systems analyst with the NMFS Honolulu Laboratory of the Southwest Fisheries Center.

The surveys will provide an estimate of the subsistence catch and verify the commercial catch estimates obtained from a system PMRD already has in place. According to Gates and Hamm, this type of information is necessary for determining whether fisheries management is needed in Palau.

"Most of the Pacific island countries have few land-based natural resources, so their economic development is linked to the ocean's resources," said Gates. "So far, most have encountered diffi-

culties in establishing locally based commercial fishing industries." The subsistence catch is typically high in the Pacific islands, particularly in rural areas where electricity and refrigeration are nonexistent and, if jobs exist, wages are very low.

"In Palau, fish are an extremely important natural resource," said Hamm. "Almost every adult male fishes, and the people of Palau especially depend on the inshore fisheries. The per capita consumption of fish is very large. Just how large is something the survey will tell us." Added Gates, "A similar study in Yap found that 90 percent of the fish caught were for subsistence." Besides the subsistence catch, the surveys will also provide information on the number of boats in Palau, the primary species harvested by each fishing method commonly used and how fishermen compare fishing today with 5 years ago.

Quantifying the subsistence catch will be particularly difficult. Palau has no subsistence fishing license or boat registration requirements. Nor does Palau have a catch limit. The surveys will obtain information that is currently unavailable. "In the tropics, it's hard to get a good picture of what's going on. There are so many species of fish. If you went spearfishing in Palau, you might catch 30 or more species of fish," said Gates. "Palau has over 1,000 species of fish."

Conducting the actual surveys will be no easy task: All but 1 of Palau's 16 states are rural areas with villages spread across islands and atolls. "A lot of the villages are approachable only by water and only at high tide," said Hamm. Palau also has a broad spectrum of lifestyles. The largest state, Koror, is fairly metropolitan, whereas other states such as Hatohbei have no electricity, no modern conveniences. The survey design had to account for these differences.

The clan system in Palau will make it easier to determine the number of boat owners, according to Gates. The people network will help identify and locate all the boat owners within a village. The surveys will be conducted by three PMRD employees trained in survey techniques by Gates and Hamm, who also set up a system to computerize the

information gathered during the surveys.

"The PMRD staff is very capable," said Gates. He is optimistic about the future results from the surveys and hopes that someday there will be a standardized procedure for obtaining data on subsistence catches for all Pacific island nations so that the results are comparable.

Palauans favor several fishing methods: Daytime and nighttime spearfishing inside and outside the reefs; hook-and-line bottom fishing in shallow water; "kesokes," which consists of setting a net over a reef exit point at high tide and then catching the fish in the net on the falling tide as the fish head for deeper water; and trolling. The fish species that Palauans primarily target are surgeonfish, parrotfish, rabbitfish, and various snappers and groupers.

U.S. Withholds Fishing Privileges From Japan

On 6 April 1988, President Ronald Reagan reported to Congress his actions to encourage all nations to adhere to the conservation programs of the International Whaling Commission (IWC). Among those actions, the United States toughened its constraints against Japan for that country's whaling activities by withholding 100 percent of the directed fishing privileges that would otherwise be available to Japan in the U.S. Exclusive Economic Zone.

Last February, following confirmation that Japanese were killing minke whales in the Antarctic under a contested research whaling plan, Commerce Secretary C. William Verity notified the President—in a process called "certification"—that Japan's whaling was "diminishing the effectiveness" of the IWC's conservation program. The action, the strongest permitted by the Packwood-Magnuson Amendment to a Federal fishing law, denies Japan's request to harvest 3,000 metric tons of sea snails and 5,000 metric tons of Pacific whiting. In addition, Japan will be barred from any future allocations of any other fish, including Pacific cod, until the Secretary of Commerce determines the situation has been corrected.

Under a companion Federal Law, the Pelly Amendment, the President could have embargoed up to 100 percent of Japan's fishery products entering the United States. Instead, he asked the Secretary of Commerce and the Secretary of State to monitor Japan's whaling practices and report to him by 1 December, saying that a total withholding of Japan's directed fisheries allocation, coupled with a Presidential review, is the best means of encouraging Japan to conform with the IWC's conservation program.

U.S. Fines Japanese Vessels \$150,000 for Illegal Fishing

Five Japanese vessels, accused by the United States of fishing illegally in U.S. waters off Alaska in mid-January, have agreed to pay the government penalties totaling \$150,000, according to the National Oceanic and Atmospheric Administration (NOAA). In addition, the Commerce Department agency said it expects payment of a penalty of \$50,000 from a sixth vessel that was fishing illegally at the same time and had obscured its name. The penalties are the maximum possible under the Magnuson Fishery Conservation and Management Act.

NOAA said it is awaiting further information from the Japanese government about the identity of a seventh vessel that appears briefly in videotape footage provided by an Alaska fishermen's association. One of the vessel owners, Hamaya Suisan Co., will be denied permits for any of its vessels to fish in U.S. waters for 5 years, although the company will still be allowed to engage in joint ventures with American vessels. Two other companies, Taisei Gyogyo Co. and Senkon Gyogyo Co. will be denied fishing permits—including joint-venture permits—for their vessels for three years. In joint-venture operations, which last year resulted in a record 3.5-billion-pound-harvest, American fishermen sell their catch at sea to foreign processing boats. NOAA said that the Japanese government,

which it characterized as being "extremely cooperative" in resolving the cases, has decided to levy sanctions of its own against the fishing vessels.

Eleven Indicted in Herring Conspiracy

An investigation by the National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service and the State of Alaska has resulted in the indictments of 11 suspects for conspiracy to illegally harvest herring spawn on kelp and export it for sale in Japan. The secret indictments, made public earlier this year, charge the eleven-member ring, including fishermen, brokers, and foreign seafood wholesalers, with poaching at least \$750,000 worth of the seafood delicacy off southeastern Alaska and trying to gain large profits by secretly transporting, selling, and exporting it in interstate and foreign commerce between 1985 and 1987.

Special agents from the Fisheries Service in Seattle and the Alaska Department of Public Safety made a joint raid of the operation on 10 April 1987, and arrested Tamdamitsu Sakurai, president of Hokkai Marine, Ltd., a large Japanese-Canadian seafood export business in British Columbia. He was charged with conspiracy to purchase and export the seafood and three counts of unlawful interstate transport of the herring spawn under the Federal Lacey Act. The indictments allege the group concealed its activity by obtaining a permit that allowed taking the herring spawn for personal use. After harvesting the spawn, it is alleged the suspects rented moving vans to transport the seafood to Seattle, where it was scheduled for shipment to Japan.

In February 1988, two other suspects entered guilty pleas before a federal judge in Alaska following indictments in the same case. Meanwhile, eight additional suspects, including three Seattle seafood brokers, are scheduled for similar prosecution for allegedly attempting to continue the illegal trade of the fish products after the main ring was broken.

Herring spawn on kelp, also known as gau or kazunokokombu, is a delicacy in Japan and other countries. The product is harvested by uprooting the seaweed immediately after herring lay their eggs on it. Since 1967, it has been illegal in Alaska to harvest it commercially. Its retail price ranges from \$30 to \$35 per pound. In addition to Sakurai, those indicted were Willis Hamilton, Donald Moore, and Henry Leask of Ketchikan, Alaska; Jim Frank, Byron Skinna, and Gideon Duncan of Hydaburg, Alaska; Lavina Grey, Grant Boe, and Lloyd Whaley of Seattle; and Steve Kinley of Ferndale, Wash.

Basic N.E. Fishery Data Now Available

Northeastern U.S. fisheries represent an important component of U.S. fisheries and have experienced many changes in recent years. Recent significant changes in management/regulations (i.e., ICNAF Management, MFCMA of 1976, the 1984 U.S.-Canada boundary settlement on the Gulf of Maine), in the status of biological stocks, and in fishing participation have occurred in the Northeast Region. Therefore, it is necessary to review these fisheries from an historical perspective to assist in understanding these changes. For this purpose, the NMFS Northeast Regional Office has put together a set of basic fisheries data in the form of charts and statistics. In this report, investment, landings, biological abundance, productivity, and costs and earnings are emphasized. Copies of the report are available from: NMFS, Northeast Fisheries Report, Analytical Services Branch, P.O. Box 1109, Gloucester, MA 01931-1109.

Lobster Tagging Program Set for 12-Mile Dumpsite

NMFS Northeast Fisheries Center scientists have begun a 2- to 3-year tagging program with lobsters from the 12-Mile Dumpsite in the New York Bight apex. The Dumpsite was recently closed and marine resource and en-

vironmental managers are watching for signs of recovery of the site's fisheries habitats. The recapture of lobsters that have been tagged and released in and around the Dumpsite should provide such information by detecting any changes in the direction and rate of lobster movements, as well as in the incidence and severity of lobster exoskeleton (shell) diseases.

Lobsters are being tagged with 1½-inch long, pink or yellow "spaghetti" tags which offer a reward. The reward is \$3 plus the landed value of the lobster, and can be claimed by returning the tagged lobster to an NMFS port agent or the Center's Sandy Hook Laboratory in Highlands, N.J. "Short" (legally undersized) lobsters will be tagged, and possession of "shorts" by fishermen will only be permitted, provided that the tag remains in the lobster and is promptly returned to a NMFS port agent.

Gulf Red Drum Fishery Is Closed Indefinitely

The final rule implementing Amendment 2 to the Fishery Management Plan for the Red Drum Fishery in the Gulf of Mexico became effective on 29 June 1988. According to Joseph W. Angelovic, Acting Regional Director, National Marine Fisheries Service, Amendment 2 prohibits the harvest or possession of red drum in Federal waters until the adult population has been restored to levels that would safely allow the resumption of an offshore fishery.

Federal waters have been closed to the harvest of red drum since 1 January 1988 in response to stock analyses that indicated a distinct depression in the abundance of fish under 12 years of age. The scarcity of these age classes of red drum offshore has been attributed primarily to the excessive harvest of juveniles from state waters. Accordingly, states bordering the Gulf have been asked to increase the escapement of juvenile red drum to restore the offshore spawning stock to former levels of abundance. Those states are in various stages of revising their fishery laws to achieve the recommended 30 percent escapement rate of juveniles from the inshore

and nearshore waters. Copies of the final rule may be obtained from the Fisheries Operations Branch, National Marine Fisheries Service, 9450 Koger Boulevard, St. Petersburg, FL 33702.

Court Okays Sea Turtle Safety Rules

Shrimp fishermen from Texas to North Carolina must use special TED devices or reduce their trawl times to prevent the drowning of sea turtles accidentally caught in their nets, following an order by the Fifth Circuit Court of Appeals, the National Oceanic and Atmospheric Administration (NOAA) announced. The Court's order, handed down 11 July in New Orleans, upholds Federal regulations mandating either turtle excluder devices (TED's) or reduced net towing times. The Court also said that as of 1 September it was lifting a lower court injunction that suspended the regulations while the case was being appealed.

The State of Louisiana and the Concerned Shrimpers of Louisiana had challenged the Federal rules in district court last year. James Brennan, head of NOAA's National Marine Fisheries Service said his agency was "ready, willing and able to help make TED's work most effectively for any shrimper. I don't believe there's a shrimp fisherman anywhere in the country who wants to see turtles killed," Brennan said. "It's up to all of us to see that turtles are protected and that shrimp fishermen can continue their work with a minimum of disruption."

Of the five species of sea turtles found off the U.S. coast, all are listed as threatened or endangered and are protected by Federal law. NOAA said that without TED's some 48,000 sea turtles would be caught in shrimpers' nets each year and that about 11,000 would die. Shrimp fishermen who fail to take the required steps to prevent turtles from being caught or drowned in their nets run the risk of being fined up to \$10,000 under the Federal Endangered Species Act, NOAA said.

The effect of the court order is that shrimp trawlers of 25 feet and longer

will be required to use TED's when fishing in Gulf of Mexico or southwest Florida waters out to 15 n.mi. from shore and in the Cape Canaveral area of Florida. Boats under 25 feet must limit trawling time to 90 minutes in these waters. All vessels fishing for shrimp in inshore waters must limit trawl times to 90 minutes or use TED's. The dividing line between offshore and inshore waters is the COLREGS line found on 1:80,000 NOAA nautical charts. Staff at the Fisheries Service and at NOAA Sea Grant Offices will be available to help shrimpers find TED's and to assist in their installation and use. Information on TED suppliers is available from Charles A. Oravetz, NMFS, 9450 Koger Boulevard, St. Petersburg, FL 33702; (813/893-3366) or local Sea Grant Offices. TED gear specialists are at the Fisheries Service Pascagoula, MS, Laboratory (601/762-4591); Georgia Sea Grant (912/264-7268 and Texas Sea Grant (409/849-5711). Louisiana Sea Grant (504/388-6733) will soon have a gear specialist available.

A "Soft" TED Approved

Final regulations certifying a new soft Turtle Excluder Device (TED) for use by shrimp trawlers to conserve sea turtles became effective last October, according to Craig R. O'Connor, Acting Regional Director of the National Marine Fisheries Service (NMFS). Those regulations amended regulations published on 29 June 1987 that were designed to reduce the incidental catch and mortality of sea turtles in shrimp trawls. The 29 June 1987 regulations allowed the use of four types of TED's.

They also contained a provision for qualification of new TED's if the TED's were tested according to procedures specified in the rule and found to be 97 percent effective in releasing sea turtles from trawls. This new TED, called the Morrison soft TED, was tested and found to be effective. For further details or copies of the regulations contact Charles Oravetz, NMFS, 9450 Koger Blvd., St. Petersburg, FL 33702, telephone (813) 893-3366.

TED Evaluation Program Underway

The National Marine Fisheries Service, in cooperation with the shrimp industry initiated a TED Evaluation Program on 5 March 1988. The overall objective of this program is to determine the effects of utilization of certified TED's on commercial shrimp trawlers in the South Atlantic and Gulf of Mexico. Specifically, the program is aimed at determining catch rates of shrimp for TED-equipped trawls and trawls without TED's in selected shrimp fishing areas of the southeast region. Observers will be placed on shrimp vessels operating off of Texas, Louisiana, Alabama, Mississippi, Florida, Georgia, and South Carolina. Catch per unit effort (CPUE) will be determined for trawls with and without TED's during peak months of the shrimping season. These data will then be analyzed using standard statistical procedures to determine whether there are or are not differences in catch rates between certified TED-equipped trawls and standard shrimp trawls without TED's.

Trained observers are available for work throughout the Gulf of Mexico and in the South Atlantic. Cooperation from the shrimping industry has been sought to place observers aboard vessels to help document the catch rates of shrimp nets equipped with TED's and standard nets. Assistance has been received from Sea Grant personnel throughout the Gulf of Mexico and South Atlantic, from the Texas, Louisiana, and South Carolina shrimp associations, and the Southeastern Fishery Association in locating vessels to use in this program. Gear specialists from Sea Grant (Texas) and from the NMFS Pascagoula Laboratory have been involved in tuning fishermen's nets with TED's. The South Atlantic Fishery Development Foundation is providing TED's and some additional funding for the program.

During June, four boat trips were made in Texas, two in Georgia, and one in Louisiana. In Texas, the efficiency of trawls equipped with Georgia TED's was comparable to that of standard trawls, and the TED's outproduced standard trawls on one trip. In Georgia, trawls equipped with Georgia TED's showed a slight increase in catch on one trip and a slight decrease in shrimp production during the second trip. A problem with the tickler chain occurred during the two which was responsible for the loss of shrimp by TED's. In Louisiana, both Georgia and Saunders TED's showed a high degree of shrimp loss in relation to standard trawls. Two Georgia TED's and one Saunders TED were severely damaged. Damaged TED's as well as clogging with debris were at least partially responsible for shrimp loss.

From the beginning of the study until about July, a total of 65 observer days have been expended on commercial vessels in the Gulf of Mexico and 10 days in Georgia. Two cruises had been completed in Key West, Fla, three from Freeport, Tex., two from Fourchon, La., and two from Brunswick, Ga. Trips were in progress at Aransas Pass and Brownsville, Tex. In general, the efficiency of TED's has varied on a trip by trip basis in a manner not unlike the results reported above. The continued cooperation of the shrimping industry in this program is appreciated.

Update: TED Rules Delayed

Rules mentioned above requiring use of Trawling Efficiency Devices have been delayed until 1 May 1989 for offshore waters and until 1 May 1990 for inshore waters.

A bill which was passed by the U.S. Congress reauthorizing the Endangered Species Act and signed by President Ronald Reagan on 7 Octo-

ber 1988 incorporated the TED rule delay.

The delay is effective in the southeastern United States except at Cape Canaveral, Fla., where TED's are required year round. For further information on the TED rule status, contact Charles Oravetz (telephone 813-893-3366).