

ENDANGERED SPECIES

Technical Bulletin

U.S. Department of the Interior
Fish and Wildlife Service

Navy is Enlisted in Plan to Protect Manatees

by Robert Turner and Cheryl Buckingham

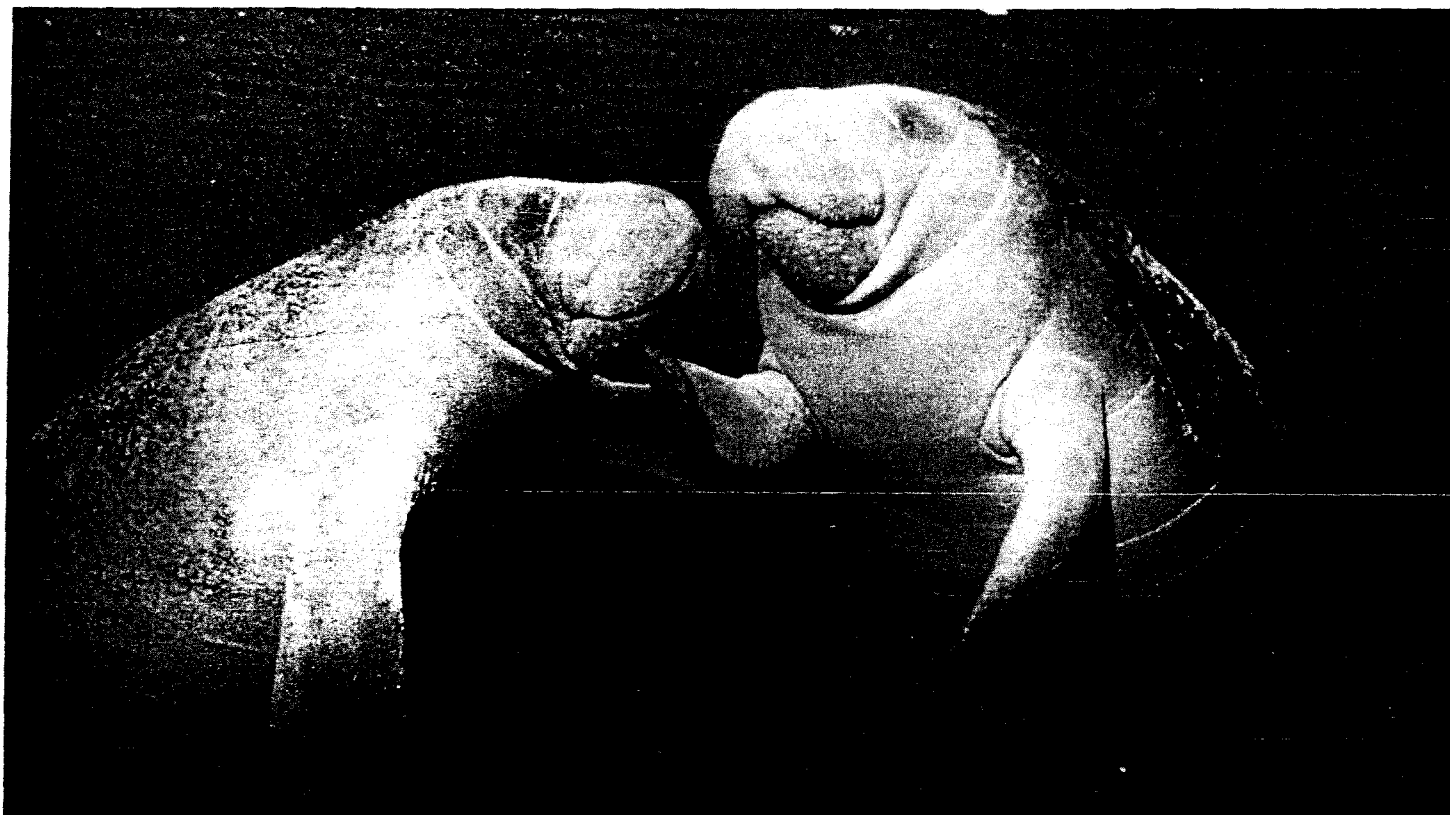


photo by Pat Hagan

On the morning of May 7, 1990, a tugboat at the Naval Submarine Base (SUBBASE) at Kings Bay, Georgia, struck something that nearly stopped one of its 4,000-horsepower engines. Blood and animal tissue filled the water. Within hours, Robert O. Turner, Manatee Coordinator for the U.S. Fish and Wildlife Service (FWS), received the report: a West Indian manatee (*Trichechus manatus*) might have been struck by a C-tractor tug, a 105-foot (32-meter) long boat designed to maneuver Navy submarines in the harbor. Bob Turner immediately contacted the manatee research group, the Sirenia Project, at the

Gainesville, Florida, Field Station of the FWS National Ecology Research Center. The response to the incident touched off a series of events that has led to a new era in FWS/Navy cooperation for protection of this Endangered mammal.

The preceeding July, in Kings Bay, Sirenia Project biologists Barbara Zoodsma and Jim Reid had fitted a large adult manatee, Mary, with a tether and a floating radio transmitter. Using radio receivers mounted on trucks and boats, the biologists tracked Mary's movements for the next several weeks in Kings Bay and nearby creeks. A satellite also monitored the manatee's locations in the area

and her mid-August migration south to Brevard County, Florida, for the winter. When Mary returned to Kings Bay in the spring of 1990, her activities were logged for 46 days until her final location was received on May 7, the same day the C-tractor tug reported striking a manatee.

Three days after the accident, Zoodsma and Reid searched the area with a hydrophone and sonic receiver. They began receiving signals from the sonic beacon used to locate radio tags like Mary's at close range. Soon after the biologists detected the beacon, SUBBASE security staff discovered two parts of a

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manatee carcass mutilated by a large propeller. Unique scar patterns provided conclusive evidence: the accident victim was Mary. The search also yielded additional evidence—parts of two other manatees. A fetus, very likely Mary's, was discovered on the shore near the impact site, and the upper trunk of a calf was found along the shore, south of Kings Bay.

Manatee Protection Plan

On May 16, 1990, the Sirenia Project biologists and Manatee Coordinator Turner met with Captain John Nuernberger, the Commanding Officer of SUBBASE. They discussed how the manatees met their deaths and how to prevent such tragic events in the future. The discussion initially focused on the C-tractor tug's twin 86-inch (218-centimeter) propellers, each encircled with an outer ring and attached to a pivoting drive shaft that gives the boat the ability to turn quickly and even move sideways, providing maneuverability important in confined areas. Because each of the large, unguarded propellers can create enough suction to pull in a nearby manatee, and because the propellers can change direction rapidly, any manatee near the craft could be in danger.

The group then broadened its sights to other Navy vessels stationed at the Kings Bay base, especially large boats that leave little room in fairly narrow channels for manatees to share. The best approach, all participants agreed, was for the Navy to develop a comprehensive Manatee Protection Plan for the base.

Fortunately, much is known about manatees in the Kings Bay area. Although it is at the northernmost end of their winter range, a small number of manatees can be found using the warm-water discharges from paper mills operated by the Gilman Paper Company in St. Marys, Georgia, and the Container Corporation in Fernandina Beach, Florida. During the summer, this population is supplemented by manatees like

Mary that migrate northward along Florida's east coast. Since 1986, 12 of these manatees have been radio-tagged. Their movements have demonstrated that Kings Bay is a center for manatee activity during the warm seasons. A graduate study on the feeding ecology of manatees provided additional information on their activity patterns and habitat use. Based on these biological findings, Sirenia Project staff outlined the SUBBASE manatee protection plan.

Analysis of the manatee carcasses and the circumstances associated with the tug's report of a manatee strike showed that Mary and her unborn calf had been killed by one of four C-tractor tugs operating in Kings Bay. The other manatee was killed by another unknown, large vessel in the same area. The Service recommended, therefore, that the SUBBASE Manatee Protection plan include caging the tunnel-style openings of the C-tractor tug's propulsion system to prevent manatees from being pulled into the propellers.

Because manatees have more time to avoid slow-moving boats, another recommendation was to establish a baywide idle-speed zone for all boats except security boats responding to emergencies. In places where manatees are known to congregate, the FWS recommended establishing and posting no-entry areas. In addition, since manatees are frequently sighted near docking facilities, where they drink fresh water from leaking water pipes and storm water runoff from small creeks, the FWS recommended identifying all fresh-water discharges in Kings Bay and implementing special protection measures, such as idle-speed or no-entry zones. The FWS encouraged the Navy to eliminate artificial fresh-water discharges from areas where manatees could be struck by boats, or to reroute the discharges to other areas.

The FWS also recommended that the Navy develop a formal Manatee Watch and Alert program involving all base operations, including Port Services, Navy and Port Security, tug and boat operators, and dock personnel. Manatee sightings could then be relayed to a central loca-

tion, such as Port Services, to alert personnel conducting operations that could pose a danger to manatees. The final recommendation was for a formal protocol for verifying and recovering manatee carcasses.

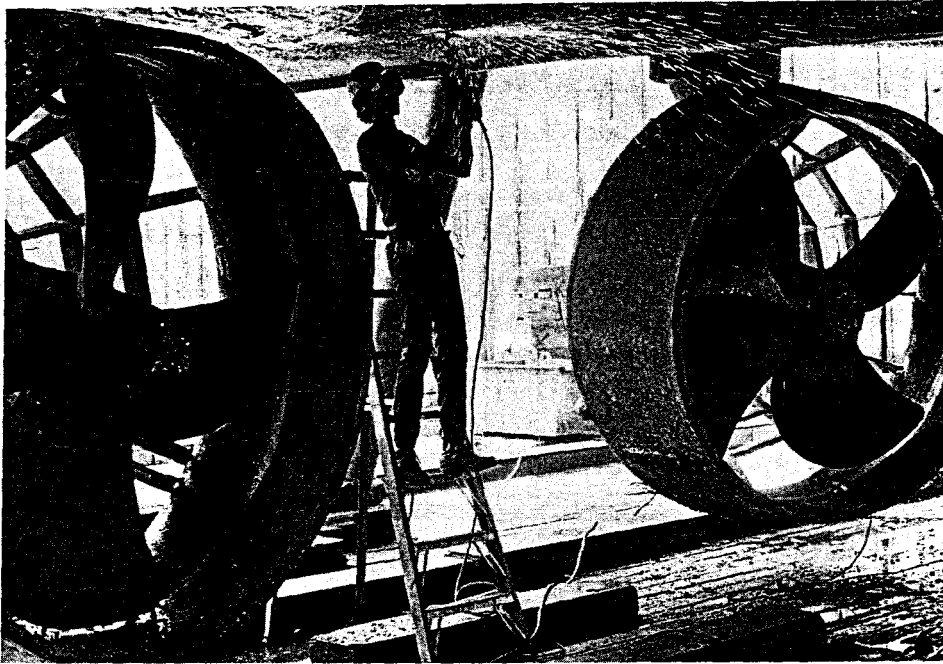
Using FWS recommendations, Captain Nuernberger quickly demonstrated the Navy's concern for manatees by implementing an in-depth Manatee Protection Plan for SUBBASE.

Designing a Safer Propeller

As part of the Manatee Protection Plan, the Navy undertook an engineering study to determine what type of system for caging the intakes of the C-tractor tugs' propulsion would best protect manatees while providing enough thrust for the boats to operate efficiently. In early July 1990, with the backing of Military Sealift Command in Washington, D. C., the Navy began a cooperative effort with Edison Chouest Offshore, owners of the C-tractors, to complete the feasibility study. The company then designed a prototype propeller guard and evaluated it to see if it would protect manatees without adversely affecting the performance of the tug. Protecting the manatees was not difficult—a simple cage with properly spaced bars could do it—but the performance of the tug was critical, as was the ability of the cage to withstand tremendous pressure and strain. The evaluation showed that even under extreme environmental conditions, the guards caused the tug to experience no more than a 10 percent efficiency loss, well within acceptable limits.

On September 13, 1991, after thousands of hours of work, the manatee guards were installed on the first C-tractor tug at a shipyard in Savannah, Georgia. The tug resumed normal operations and underwent a 60-day trial period. Tests indicated that the tug's drives were as effective as ever; in fact, the guards reduced vibration and cavitation, thus improving overall performance. Based on these exciting test results, the remaining three C-tractors were equipped with pro-

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U.S. Navy photo

A clear view of the 86-inch propellers of a C-tractor tug. Manatee guards are unnecessary on the back of the propellers because reversing is accomplished by rotating the propellers on a vertical axis.

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propeller guards before the end of March 1992.

The Navy's efforts did not stop there. Along with outfitting the C-tractors at a cost of \$50,000 apiece, the Navy installed propeller guards on all 24 of the small craft operating out of Port Services, at an additional cost of \$12,000. These 24 vessels include 8 boom-boats, 3 john-boats, various security boats (including 2 cigarette-type boats), a landing craft, and other work boats and platforms.

"I salute the Navy for its rapid response to the unfortunate death of Mary and its

willingness to extend a Manatee Protection Plan to every vessel at the base," said FWS Regional Director Jim Pulliam in Atlanta. "The Fish and Wildlife Service will remember the Navy's comprehensive approach to protection when we develop plans for other port operations in manatee habitat. I regard the Kings Bay partnership in this conservation effort as a model for successful coordination among Federal agencies."

Robert Turner, the FWS Manatee Coordinator, is based in the Jacksonville, Florida, Field Office.

Cheryl Buckingham is his assistant.

Colorado River Fishes

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344 miles (554 km) comprise about 15 percent of the bonytail's historic range.

The proposed Critical Habitats include river reaches in parts of Colorado, Utah, New Mexico, Nevada, Arizona, and California. Many of the areas overlap; the grand total is 2,094 miles (3,370 km).

The FWS is analyzing the potential economic effects of the Critical Habitat designations, and may exclude some areas

from any final designations if the economic benefits of exclusion outweigh the conservation benefits of inclusion. For details on the Critical Habitat proposals, including maps and habitat descriptions, see the January 29 and March 15, 1993, editions of the *Federal Register*. The analysis of economic impacts and other support documents will be available to the public in early September.

Regional News

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Status surveys are also being conducted for the flatwoods salamander (*Ambystoma cingulatum*) the Florida gopher frog (*Rana capito aesopus*), and the Carolina gopher frog (*Rana capito capito*). All three, which are Category 2 listing candidates, are residents of longleaf pine forest in the southeastern coastal plain. Although the gopher frog is primarily a resident of sandhill habitats, and the flatwoods salamander is a resident of pine flatwoods, individuals of all three taxa may be found as larvae within the same temporary pond when their habitats coincide. Status reviews for these amphibians will be completed when their distribution is better defined.

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Region 5 — On February 19, 1993, the FWS New Jersey Field Office, in conjunction with the New Jersey Department of Environmental Protection and Energy and the New York Department of Environmental Conservation, conducted a survey to confirm that the Endangered Indiana bat (*Myotis sodalis*) was using an abandoned mine in Morris County, New Jersey, as a winter hibernaculum. A total of 24 Indiana bats were found in the mine. Although the bat's presence in New Jersey had been suspected, this was the first confirmed sighting of hibernating Indiana bats in the State.

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Several New Jersey populations of the bog asphodel (*Narthecium americanum*), a Category 1 candidate plant, are being afforded intensive protection through a cooperative effort between the FWS New Jersey Field Office and the New Jersey Office of Natural Lands Management. Signs are being posted in the pine barrens of Burlington and Ocean Counties to prevent trespass into sensitive areas, and population surveys to determine the plant's specific geographic distribution are under way. This pre-listing recovery effort, which may eliminate the need for listing, will also include the erection of barriers to prevent vehicle access to prime habitat, creation of public information

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