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FEATURE MATERIAL

# INTERIOR SCIENTISTS SEEK TO HELP MEET FUTURE FISHING DEMAND

The United States has more fresh-water fishing areas today than at any time in history, and the area available to anglers is expected to grow another 10 million acres in only 35 years.

The Department of the Interior says the "new" fishing water comes from man-made reservoirs now covering 13 million acres. Most of these are formed by dams built by the Bureau of Reclamation, the U. S. Army Corps of Engineers, and the Tennessee Valley Authority.

Such impoundments are providing one-third of all fresh-water fishing in the United States, exclusive of the Great Lakes. And reservoir fishing will become increasingly popular as both population and leisure time continue to grow, the Department forecasts.

Part of the demand on reservoirs also will come from destruction of fish habitat in natural streams due to pollution, channeling, highway construction, and from the closure of private waterways to the public.

All together, new reservoirs must provide a total of 275 million fishing days annually for United States sport fishermen by the year 2000, the Department believes.

Establishing a place to go fishing and a place to catch fish is not always the same. Interior's Fish and Wildlife Service has been handed the task of helping make sure that present and future reservoirs are productive.

Reservoirs are the most difficult of all fishing waters to manage successfully. The impoundments usually are created for irrigation, navigation, electric power production, and flood control, or a combination of these. The result often is fluctuation of water levels that causes abrupt changes in living

conditions for fish. These changes can be harmful, especially if they occur when game fish are spawning.

Another drawback is the short period of high game fish productivity in newly created reservoirs. Fishing usually is good to excellent in new bodies of water for a few years; then there is a rapid decline.

Fishery scientists believe that, in some cases, the early productivity results from the presence of decaying plant materials and other organic matter on the reservoir floor which enrich the water and encourage the growth of plankton.

These tiny plants and animals are eaten by aquatic insects and small fish, which are, in turn, eaten by larger fish. When the initial organic materials decline, the fishing often slumps.

The Bureau of Sport Fisheries and Wildlife in Interior's Fish and Wildlife Service has established a National Reservoir Research Program in an attempt to learn how the production of fish can be maintained.

One team of researchers--South Central Reservoir Investigations--is studying lakes on the White River, which flows through the Ozark Mountains on the Arkansas-Missouri border. A second team, the North Central unit, works on main-stem reservoirs along the Missouri River in Nebraska, South Dakota, and North Dakota.

Many research techniques are used in studying reservoir water and fish populations. The teams even go under water with SCUBA gear and a submarine in their quest for knowledge.

The submarine, used in the South Central area, accommodates two scientists. It is battery-powered and has a cruising range of 15 miles. Its two conning towers have 360-degree viewing, and there is a glass plate in the bottom to permit close observation of fish in their habitat.

The scientists are attempting to learn more about the food requirements, feeding habits, growth, predation, disease and causes of mortality for various species of fish at different ages. A comparison of their findings with known reservoir conditions will provide guidelines for better management.

One of the most important factors in fish productivity is the quality of water in which the fish live. A basic element in water quality is the amount and kind of minerals present. Scientists can measure these electrically. A cable with electrodes is lowered to various depths in the water, and the speed at which an electrical charge travels through the water provides information on its mineral content.

Water samples, from various depths and in different seasons, show the amount of plankton available to small feeders.

Fishery biologists, working at Lewis and Clark Lake, on the border of Nebraska and South Dakota, use a device that automatically collects plankton and another that continuously records water temperatures, acidity, dissolved oxygen, conductivity, and other data.

Sonar is used to study bottom contours and to locate fish. Comparison of recorded graphs shows shifts in fish populations from season-to-season, month-to-month, and even from day to night. Scientists have observed abrupt changes between day and night in schooling behavior and in the vertical position or depth where fish are found.

The rate at which water is exchanged in a reservoir also is an important object of study. In some lakes, such as those in the Ozarks, the rate of exchange is slow, averaging about nine months at Bull Shoals. At Lewis and Clark Lake, however, there has been at times a complete change of water every 12 days.

Much of the work is concentrated on studies of the early life of fish. This critical stage is made even more hazardous in reservoirs because of water fluctuation. Changing water levels have serious effects on the success of spawning and the survival of young fish.

Valuable information is gained from studies of sample fish. The scales, for example, show annual growth rings similar to those of a tree. When the age of the fish is compared with its length and weight, the rate of growth can be determined and a cross-check thus is provided on food abundance and water quality.

One effort of the National Reservoir Research Program is to collect and organize the scattered scientific literature on reservoir fisheries. This is a huge task in which computers will be used to store data and to analyze the relationships among fish production, water management, and the physical and chemical characteristics of reservoirs.

Several species of reservoir fish are not considered valuable for sport, but offer promise for commercial use. The Bureau of Commercial Fisheries, another Fish and Wildlife Service agency, is studying the fishery resources of Oahe Reservoir of the Corps of Engineers, which extends from central South Dakota into North Dakota. This research project seeks to develop an understanding of factors influencing the size and distribution of commercial fish species, and to obtain information that could lead to full utilization of the commercial fishery resource.

There is close coordination between both Bureaus of the Fish and Wildlife Service to insure full consideration of both sport and commercial fishing in reservoirs.

The end result of Interior's research is the use made of the new knowledge. State conservation agencies, which manage the reservoir fisheries, cooperate in this phase of applied research. The biologists of both jurisdictions are confident their studies are paying off. They believe it is only a matter of time until reservoirs can be made to reach their full potential as long-lived fishing sites.

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