Gains Made in Protecting World's Whale Stocks

Progress was made in protecting the world's whales at the annual meeting of the International Whaling Commission (IWC) in Brighton, England, in July, the National Oceanic and Atmospheric Administration reports.

The Commission imposed a zero quota for the hunting of sperm whales in all areas except the western North Pacific. There is no quota for the area unless the Commission adopts one at its special meeting next March. Sperm whaling also had been permitted in the southern hemisphere and the North Atlantic.

The Commission extended its ban on the use of nonexplosive grenade harpoons to apply to the commercial harvesting of minke whales. These so-called "cold" grenades, which are considered inhumane, were prohibited last year for all commercial whaling operations except minke whaling. The extended ban takes effect in 1983. The Commission also said it recognized the need to upgrade its management procedures, and will work toward accomplishing that goal by next year.

The U.S. delegation had pressed for an immediate moratorium on all commercial whaling and also sought to strengthen management procedures governing commercial whaling, develop procedures to manage subsistence whaling by aboriginal people, and ban the use of cold harpoon grenades to kill whales.

The U.S. position on these issues is developed by a committee from NOAA, the State Department, Interior Department, the Marine Mammal Commission, members of Congress and groups representing wildlife management, animal protection, and native peoples.

The IWC was formed in 1946 to review and establish conservation measures to protect the world's whale stocks.

John Byrne Is New NOAA Administrator

John V. Byrne was sworn in on 24 July as Administrator of the Commerce Department's National Oceanic and Atmospheric Administration (NOAA). Commerce Secretary Malcolm Baldrige officiated at the ceremony.

Byrne previously was vice president for research and graduate studies at Oregon State University, Corvallis. He had held various positions in research and oceanography at the university since 1960.

He was an Associate Professor in 1960-65; Professor and Chairman, Department of Oceanography in 1968-72; Dean, School of Oceanography in 1972-76; Acting Director, Marine Science Center in 1972-77; Dean of Research (Acting) in 1976-77; Dean of Research in 1977-80; Dean of the Graduate School (Acting) in 1979-80; and Vice President for Research and Graduate Studies since 1980.

John V. Byrne

Byrne was Program Director for Physical Oceanography, National Science Foundation in 1966-67. In 1966-68 he

An Ocean Energy Role for NOAA

The Commerce Department is clearing the way for a multibillion dollar U.S. export activity, based on the technology of harnessing energy from the oceans. Commerce Secretary Malcolm Baldrige said the department has prepared a "one-stop" licensing system for commercial development of ocean thermal energy conversion (OTEC).

Baldrige said the regulations remove any legal or international barriers for such development. They will help U.S. firms comply with both domestic and international laws. They were published in the *Federal Register* on 31 July.

The licensing program is being conducted by the department's National Oceanic and Atmospheric Administration. NOAA Administrator John V. Byrne pointed out that more than 60 countries, many of them poorer nations dependent on imported oil, have ready access to thermal resources. "If U.S. private industry reaches even a small percentage of that market, OTEC sales should total several billion dollars a year during the next 30 years," he said.

Ocean thermal energy conversion is expected to compete effectively in world energy markets. It taps the solar energy stored in warm surface waters of oceans. Most of this power can be transmitted to shore for use by electric utilities. OTEC plants also use the electricity generated to produce other energy-intensive products such as ammonia or aluminum.

The system uses a fluid such as ammonia that is able to boil and condense over a small temperature range. As the surface water's warmth is transferred to the fluid in a large heat exchanger, the fluid evaporates into a gas that runs a low pressure turbine. Cold bottom water drawn from the ocean's depths is used to condense the vapor back into a liquid. The plants can be located either at sea or on adjacent land sites.

was a geologist with the U.S. Geological Survey.

He has been a member of many scientific and professional societies including: American Society for Oceanography; Marine Technology Society; Society of Economic Paleontologists and Mineralogists; American Association of Petroleum Geologists; and the University Corporation for Atmospheric Research. He is the author of many articles and papers on geology and oceanography.

Byrne was graduated from Hamilton College (B.A., 1951); Columbia College (M.A., 1953); and the University of Southern California (Ph.D., 1957).

Byrne is married, has four children, and resides in Corvallis, Oreg. He was born in Hempsted, N.Y., on 9 May 1928.

The Role of Aluminum in Fish

Aluminum (Al) is not considered to be an essential trace metal in fish. Nevertheless, when research diets are compounded for trout or salmon, the trace metal pack used in these diets invariably contains aluminum, usually to bring the final diet to about 10 ppm aluminum. The basis for inclusion of aluminum and other trace metals (e.g., copper, manganese, or cobalt) in fish diets was trace metal analysis of either whole fish carcasses or fish eggs. Simply put, it was believed that trace metals found in wild populations of fish indicate that these metals were required for good fish nutrition.

In some preliminary studies being conducted by the NMFS Northwest and Alaska Fisheries Center's Utilization Research Division of trace metal bioavailability and requirements of salmonids during their life cycles, some unusual changes were observed in whole body aluminum concentrations. Unfertilized trout eggs were found to contain 49 ppm aluminum. As the fish hatched from the egg, the combined fish plus yolk sac contained 77 ppm aluminum. When the yolk sac disappeared, the fish contained only 6-10 ppm aluminum. As the fish continued to grow, tripling in weight, the whole body concentration of aluminum declined to <4 ppm. During this growth development period, calcium (Ca) continued to increase as expected since bone was forming in the fish (1,400 ppm calcium in the ova to 22,000 ppm in the 1.5 g fish).

So far no work has been reported on the growth and survivability of fish fed reduced aluminum diets. However, the marked decline in aluminum as the fish grows strongly suggests that this metal may play a role in the early development of the fish or in the reproductive process. The apparent decline of aluminum during this early stage of fish growth may be related to the rapid tissue and bone formation. The high concentration of aluminum in the yolk sac might be associated with membrane architecture, egg fertility, or survivability. While no feeding studies utilizing aluminum-deficient diets are planned, the levels of aluminum in fish tissue, at various life stages, will be monitored. If indeed aluminum is essential in salmonid nutrition, the implication of this finding will play a major role in proper formulation of hatchery diets and concomitant salmonid aquaculture.

John C. Wekell

Electron Microscopy to Examine Structural Changes in Fish Muscle

The development of tough, dry texture during frozen storage of certain species of fish has been attributed to changes within their myofibrillar proteins. Electron microscopy is just now becoming a useful food research tool to follow these changes. Interestingly, the functional properties of fish muscle that are so important in fabricating foods are directly related to the changes in these myofibrillar proteins.

In cooperation with Joyce Hawkes, of the NMFS Northwest and Alaska Fisheries Center, the Center's Utilization Research Division has been using the electron microscope to determine the role of the ultrastructural changes occurring in pollock muscle during frozen storage on the functional properties of fish muscle. Electron micrographs of fresh frozen pollock revealed that the muscle fibers are very similar to striated muscle of any meat where individual fibers are made up of myofibrils, each consisting of parallel actin and myosin filaments.

After 2 months of frozen storage, electron micrographs of fillets that still retained their functional properties revealed that they had undergone very little ultrastructural change. However, the myofibrils had been broken into much shorter lengths with complete breakdown of the Z-band material in the fillets exhibiting no functional properties. This alteration of the actin filaments appears to be much more important than the side-to-side aggregation of the myofibrils that has normally been thought to occur during frozen storage. Thus, electron microscopy will serve as a useful tool as we develop new processes and chemical treatments to stabilize and maintain the desirable functional and quality properties of fish muscle.

Jerry K. Babbitt

Ludwig Directs NOAA's Environment Research Lab

George H. Ludwig has been named Director of the Environmental Research Laboratories of the Commerce Department's National Oceanic and Atmospheric Administration (NOAA). He has served as senior scientist of the Boulder, Colo., research organization since November 1980.

Ludwig has been with NOAA since September 1972, when he became Director of systems integration in NOAA's National Earth Satellite Service (NESS). He later became Acting Technical Director of NESS, responsible for all technical activities including operation of the geostationary and polar-orbiting satellites, data acquisition, data processing and distribution, and satellite applications research.

Prior to joining NOAA, Ludwig was employed by the National Aeronautics and Space Administration, and was the Associate Director for data operations at the Goddard Space Flight Center.