Northeast Fisheries Science Center

RESEARCH HIGHLIGHTS

January-February 1994

In this issue

The Northeast Fisheries Science Center's *Research Highlights* is a news bulletin on selected Center research findings. News write-ups focus on practical applications and implications of those findings to fisheries resource and habitat management. A name and telephone number have been included at the end of each write-up to contact for detailed information. Names of organisms follow--to the extent possible--the lists of scientific and common names of fishes, mollusks, and decapod crustaceans published by the American Fisheries Society. Any mention of trade names does not imply endorsement. *Research Highlights* is produced by the NEFSC Information Services Unit with the assistance of the Center's scientific staff.

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Research Highlights

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Southern New England Stock of Yellowtail Flounder Declared "Collapsed"

The spawning population of the Southern New England stock of yellowtail flounder decreased from 48.4 million to 2.9 million pounds during 1989-92. During that same period, the fishing mortality level (*i.e.*, the coefficient of the instantaneous rate of fishing mortality) has ranged between 1.2 and 2.3, far above the "overfishing" level of 0.5. The 1989-92 year classes are also the weakest on record. The stock has collapsed.

These conclusions on Southern New England yellowtail flounder were among findings on seven species/stocks of Northeast fishes and squids by the plenary panel of the 17th Northeast Regional Stock Assessment Workshop. The table below lists the findings of the panel on stock levels and exploitation rates, and includes selected comments by the panel.

Species/Stocks	Stock Level	Exploitation Rate	Selected Comments
Yellowtail flounder (Southern New England)	Low	Overexploited	Spawning stock biomass at record low level. Recent recruitment weakest on record. Fishing mortality extremely high. Stock has collapsed.
Silver hake (Gulf of Maine - Northern Georges Bank)	Low	At least fully exploited	Even though recent year-classes have been small, there are few older/larger fish in stock, suggesting high mortality of younger/smaller fish due to natural predation or fishery discards.
Silver hake (Southern Georges Bank - Middle Atl.)	Low	Overexploited	Same as above.
Bluefish	Medium	At least fully exploited	Both 1992 and 1993 year classes small. General decrease in stock size and recreational catch continues.
Butterfish	Low - medium	Unknown	Survival to older ages decreased in recent years, suggesting increased natural mortality, increased discard mortality, and/or decreased availability of older ages to fishery.
Longfin squid	Medium	Probably fully exploited	Autumn 1993 abundance index among lowest on record and about half of long-term average.
Northern shortfin squid	Medium	Underexploited	Since species has one-year life cycle, potential for overfishing is substantial.

The panel's findings are included in a 31-page "Advisory Report on Stock Status: SAW 17 Plenary" which is available upon request.

Contact Helen Mustafa, (508) 548-5123x244, for a copy of the report

Contact Dr. Vaughn C. Anthony, (508) 548-5123x304, for information on the plenary panel's findings

"Sole Ownership" of Fishery Resources Explored

The Northeast Fisheries Science Center has issued one of its more thought-provoking reports in the past 20 years: "Sole Ownership of Living Marine Resources." Sole ownership would assign the exclusive rights to use a discrete, self-sustaining fish resource to a single public or private entity, such as a fisheries cooperative, government enterprise, private corporation, or international authority.

The Center's report reviews the : (1) status of U.S. fish resources and fisheries (resource depletion, excess capacity, profitability of the industry, and economic value of the resource); (2) options for controlled access (limited entry, individual quotas, area licensing, and sole ownership); (3) political economy of natural resource management (hard minerals, petroleum, forests, range, water, and wildlife); and (4) hypothetical application of sole ownership to Northea groundfish resources (species & areas to constitute property, merits of public private ownership, terms of ownership, alternate uses of resources & environment, public sector responsibilities, and transitioning from open access to private ownership).

The major findings of the report are:

1. The only holdings of natural resources by the U.S. government that are subject to open-access exploitation are marine fish resources and, to an...extent, grazing land.

2. Overfishing dissipates several hundred million--possibly...billion[s of]--dollars of resource value each year.

3. Conventional fishery quotas and effort restrictions address only the symptoms of open access, not the fundamental problem of attenuated property rights to fish resources.

4. Incentives that influence fishermen, politicians, regulators, and other [stakeholders] are fundamental to the presence of both "market failure" and "government failure."

5. Private forms of sole ownership--[true] common property or individual private property--appear more likely than limited entry, ITQs [individual transferrable quotas], or other forms of state ownership to conserve living marine resources and to secure significant net economic benefits for the nation.

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Copies of the report (*NOAA Technical Memorandum NMFS-F/NEC-99*) are available.

Contact Dr. Steven F. Edwards, (508) 548-5123x364

Attempt to Re-establish Eelgrass in Raritan Bay Fails

In the May-June 1990 issue of *Research Highlights*, we announced a pilot effort to re-establish eelgrass (*Zostera marina*) in Raritan Bay, New York/New Jersey. Where it flourishes, eelgrass serves important functions such as providing a nursery for resource species and their prey, as well as reducing erosion, turbidity, and perhaps phytoplankton blooms and oxygen depletion. Eelgrass was abundant in parts of Raritan Bay prior to the 1930s when a "wasting" disease wiped out many of the eelgrass beds along the East Coast.

In some respects, Raritan Bay represents the worst-case scenario for eelgrass re-establishment: heavy wave action, unusually high turbidity levels, high nitrate concentrations, *etc.* A successful effort, though, might encourage an expansion of the candidate areas along the East Coast for eelgrass re-establishment.

The re-establishment effort has failed, however. The combination of wave action, turbidity, shading and smothering by sea lettuce, fouling of blades by invertebrates and epiphytic algae, and nitrate enrichment appear to have doomed the experiment. For those involved with, or interested in, re-establishing eelgrass in marginal habitats, a report (*Northeast Fisheries Science Center Reference Document* 93-27) is available.

Contact Robert N. Reid, (908) 872-3020

History of Martha's Vineyard-based Swordfish Fishery Described

The Northeast Fisheries Science Center has prepared a history of the Martha's Vineyard (Massachusetts)-based portion of the East Coast swordfish fishery, from its inception in the early 1800s to the present. Until the mid-1900s, about one-third of the East Coast swordfish fleet used Martha's Vineyard as home port. Most fishermen caught their fish on Georges Bank or off Canada during summer. They harpooned the fish after spotting them from the masts of their vessels.

In the 1960s, fishermen began using airplanes to spot the fish, and markedly increased their catch. The harpoon fishery has declined sharply since the 1970s, though, largely because a new longline fishery began. That fishery uses nets as long as 30 miles, fishes waters from Canada to the Gulf of Mexico, and takes fish before they grow large enough to harpoon.

The historical account appeared as the feature article in the February 1994 issue of the *Dukes County* (Martha's Vineyard) *Intelligencer*. The article is based largely on interviews with fishermen, and is illustrated with photographs of the people and vessels participating in the fishery.

Contact Clyde L. MacKenzie, Jr., (908) 872-3019

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Recent Scientific Publications and Reports

Unless otherwise indicated, single copies of the reports listed below a. available from the Center by writing to: Information Services Unit, Northeast Fisheries Science Center, National Marine Fisheries Service, 166 Water St., Woods Hole, MA 02543-1097 U.S.A.

EDWARDS, S.F.; BEJDA, A.J.; RICHARDS, R.A. 1993. Sole ownership of living marine resources. *NOAA Tech. Memo. NMFS-F/NEC*-99; 21 p.

MURAWSKI, S.A. 1993. Climate change and marine fish distributions: forecasting from historical analogy. *Trans. Am. Fish. Soc.* 122(5): 647-658.

Northeast Fisheries Science Center/Alaska Fisheries Science Center/Southwest Fisheries Science Center/Chief Scientist's Office, National Marine Fisheries Service. 1993. Ecosystem perspectives on marine resource management: report of a scoping meeting, September 16-18, 1992, Woods Hole, Massachusetts. *Northeast Fish. Sci. Cent. Ref. Doc.* 93-24; 19 p.

REID, R.N.; MacKENZIE, C.L., Jr.; VITALIANO, J.J. 1993. A failed attempt to re-establish eelgrass in Raritan Bay (New York/New Jersey). *Northeast Fish. Sci. Cent. Ref. Doc.* 93-27; 4 p.

SHERMAN, K., editor. 1993. Emerging theoretical basis for monitoring the changing states (health) of large marine ecosystems. Summary report of two workshops: 23 April 1992, National Marine Fisheries Service, Narragansett, Rhode Island, and 11-12 July 1992, Cornell University, Ithaca, New York. *NOAA Tech. Memo. NMFS-F/NEC*-100; 27 p.

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