



NOAA NATIONAL OCEANIC AND
ATMOSPHERIC ADMINISTRATION
UNITED STATES DEPARTMENT OF COMMERCE



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FOR IMMEDIATE RELEASE
August 4, 2010

Researchers Explore Ecological Connections between Species that Migrate Through Salt and Fresh Waters and Their Oceanic Predators

Maine's Kennebec and Penobscot Rivers focus of coastal sampling study

The coastal waters off of the Kennebec and Penobscot Rivers in the Gulf of Maine will soon be the focus of NOAA researchers seeking to detect the movement of fishes that live part of their lives in these rivers and part in the ocean, and the role these species play in the Gulf of Maine's food web.

"Diadromous fish – those that migrate between fresh and salt water habitats during their lifetimes such as alewife, blueback herring, shad, and American eel - are an important food source for a number of oceanic species," said Jason Link, a fisheries biologist at the Woods Hole Laboratory of NOAA's Northeast Fisheries Science Center (NEFSC).

"Atlantic cod, goosefish, striped bass and other economically important fish species eat these smaller diadromous species, but we know little about the magnitude of their role as prey for these oceanic predators," Link said. "Determining the ecological effects that changes in the abundance of river-run species are having on these marine species is challenging. Some research has been done, but gaps exist in our understanding which we hope to fill with this pilot project."

Link and colleagues will sample the ocean waters in the vicinity of the Kennebec and Penobscot Rivers August 11-28 from the NEFSC's 72-foot Research Vessel *Gloria Michelle*, based at the Woods Hole Laboratory. Sampling will be conducted several miles offshore, not in the rivers, to determine the extent to which oceanic predators are eating the diadromous species.

The research cruise, a joint effort between NOAA's Northeast Fisheries Science Center and Northeast Regional Office, will use a bottom trawl designed specifically for Maine's coastal waters. Once on deck, each net tow will be sorted and stomach samples collected from all of the predators for subsequent diet analysis in the laboratory. Standard and routine measurements, such as fish length and weight, will also be made.

"The planned sampling is adaptive and will avoid any fixed gear in the area," Link said. Local fishermen have been hired to help crew the *Gloria Michelle* and to provide their expertise in sampling the areas offshore of the two rivers.

Juvenile alewives, blueback herring and American shad migrate to sea during late summer into fall, each species at a different time between the months of July and November. Link expects that the late summer sampling will detect the early migrating alewives and perhaps other species. He also plans to use the results from NEFSC's annual fall bottom trawl survey, which is conducted much farther offshore, to provide information about other species that migrate through the Gulf of Maine.

The NEFSC has also been collaborating with the State of Maine's Department of Marine Resources (DMR) surveys to collect additional stomach samples. Taken together, the two sets of sampling data should allow an evaluation of the quantity of diadromous species eaten by marine predators in the Gulf of Maine.

"Establishing a clear ecological connection between the river-run and ocean species would benefit future management of these stocks, especially as ecosystem-based fisheries management is implemented," Link said.

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Related Links:

Maine River Herring Fact Sheet: <http://www.maine.gov/dmr/searunfish/alewife/index.htm>

Status of American Shad Fishery in the Northeast U.S.:

<http://www.nefsc.noaa.gov/sos/spsyn/af/shad/>

Status of the American Eel Fishery in the Northeast U.S.:

<http://www.nefsc.noaa.gov/sos/spsyn/op/eel/>