



Rudstam's research team included former Sea Grant scholar Robert Klumb, seen here in summer 2000 collecting gametes from spawning alewives.

Photo by Simi Sangari

Alewife: Unlocking unknowns of a key species

Alewife is the cornerstone of Lake Ontario's ecologically and economically valuable salmon sport fishery. Data on the abundance of this key prey species are used by management agencies such as the NYSDEC and US Fish and Wildlife Service to help set sustainable stocking levels for a variety of salmon and trout species. "Alewife supports major sport fisheries contributing millions of dollars to the local economies, and we're just

starting to look at what governs the production of the species," says Cornell University's **Lars Rudstam**, lead investigator on a related NYSG-funded study.

Rudstam, based at the Cornell Biological Field Station on Oneida Lake in Bridgeport, NY, says, "We can't predict effects of the changing ecosystem on alewife without understanding where they grow up." So, he and a team of Cornell researchers collaborated with fisheries biologists and scientists to gather new information and summarize data already collected on the distribution of small alewife in the nearshore and embayments of Lake Ontario. "To evaluate fish recruitment, we need to know where the major nurseries areas are for young alewife," says Rudstam.

The team – including Cornell's **Ed Mills**, Canada Centre for Inland Waters' **Ora Johannsson**, NYSDEC's **Clifford Schneider**, USGS's **Bob O'Gorman**, and USFWS's **Sandra Priest** – discovered that the nearshore, rather than the protected embayments, are the primary nursery areas for alewife in the lake. "Embayments probably contribute very little to the production of young alewife," says Rudstam. "And so, this study is our first step towards understanding recruitment dynamics and, in turn, alewife production."

These nursery areas are also the most affected by the invasive zebra mussels. "A mussel-induced decrease in food for larval alewife could be problematic," says Rudstam, "as alewife need to grow large enough by fall to survive the winter." However, he notes that abundance of larval alewife were similar in data taken before (1977-78) and after (1997-98) the arrival of these filter-feeding mussels in the Great Lakes. "The nursery area may be affected by zebra mussel grazing more than

the offshore, which may lower the area's productive capacity for larval alewife," he says. But, similarities between current and past abundance levels of larval alewife suggest that the early larvae are only marginally being affected by zebra mussels. Whether later alewife growth is affected remains to be seen."

Before this study, embayments and the nearshore were not included in data collection, both because of their small area relative to the rest of the lake and the fact that large research vessels traditionally used on Lake Ontario do not operate in shallow water. "What we've done here is update the methods used to gather this information, improve the understanding of alewife's early life history habitat requirements, and better define their link in the lake's food chain," says Rudstam.

NYSG's Fisheries Specialist **Dave MacNeill** adds, "Despite the importance of alewife to the Lake Ontario sportfishery, this is the first study conducted that addresses alewife recruitment." In addition to providing a better understanding of alewife early life history, MacNeill says this research will help managers to more accurately set stocking levels for salmon.

— Paul C. Focazio



Klumb (left) and Cliff Schneider, a NYSDEC fisheries biologist at the time, picked up alewives from gillnets set in the nearshore of Lake Ontario in summer 1997. Klumb is now a Fisheries Biologist with the US Fish & Wildlife Service in South Dakota.

Photo by Nijole Pauliukonis



Lab aquaria at the Cornell Biological Field Station (left) were used in summer 2000 to rear larval alewives (middle). Alewife in their juvenile life stage (far right) were studied to see if they use Lake Ontario's inshore areas and embayments as nursery grounds.

Photos by Rob Klumb