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Smelt a key to estuary health

By Eric Aldrich

[The Nature Conservancy in New Hampshire](#)

Affordable housing in the Seacoast is in high demand; however, soon, about a hundred inexpensive houses with excellent views of Great Bay and its tributaries will disappear. These are bob houses, the little ice-fishing shanties that ice fishermen push out to traditional hot spots on Great Bay and the Squamscott, Oyster and Lamprey rivers. But as Old Man Winter's grip begins to loosen, the houses' days are numbered.

"The length of the season depends on the weather and we all know how predictable that is," noted Cheri Patterson, a marine fisheries biologist with the N.H. Fish and Game Department. "Ice conditions change rapidly on the tidal rivers, so if someone is not sure about its safety, they should not go out. No fish is worth risking your life." The fish that compels anglers to squeeze every last day out of the season is the rainbow smelt (*Osmerus mordax*).

Smelters and biologists know that each fall, smelt swim from the ocean back into the estuary where they spend the winter in relative comfort. As spring temperatures rise, smelt spawn in the tributaries, near the head of the tide, and then return to the sea.

Donald Fieldsend of Exeter and other smelt fishermen know this well, and they position their

bob houses over channels and other places where they know the smelt will be. "Oh, it's great fun," Fieldsend said. "I went out there with my father and fished. Now I go out there with my grandchildren and we catch a lot of smelt."

Because Great Bay rises and falls with the tides, the ice can be as much as 7 feet above the bottom or sitting right on the mud. So the successful ice angler has to check the tide chart and take great care getting to and from a fishing spot. To get to safe ice, smelters balance on planks of wood as they shuffle across the treacherous ice hinge that forms at the shore.

Consequently, smelt bob houses are usually lighter and more mobile than their northern lake counterparts. They are traditionally made with various, inexpensive building materials, such as blue tarps, brown plywood and pink foam insulation. Soon, the line of delightful, multicolored bob houses will be just a memory.

Sometimes the smelt-fishing action is about as exciting as watching paint dry. Other times, when the smelt are feeding near the hole, it's fast and furious. This past week, anglers were still catching in Great Bay. A legal limit is 10 liquid quarts of these 6- to 12-inch long fish, and when the bite is on, a limit can be caught in an hour. Back home, after a long day or night of ice fishing, smelt can provide a tasty, well-deserved breakfast. They can be fried, pickled, smoked, brined, barbecued, baked, broiled or served Italian-style or Canadian-style -- you name it. You can even cook them on a stove in the shack.

#### Smelt population changes

The appetite for smelt as food or bait made Great Bay a commercial fishery between the mid-1800s and the post-war 1940s. According to Patterson, Great Bay's smelt population has seen a dramatic decline since the 1940s. This suggests that larger ecological changes have occurred as well.

"Rainbow smelt are extremely important as a bait fish for many species, not just in the estuary, but also in the ocean," Patterson said. "Many larger fish that are commercially important depend on healthy populations of smelt for forage."

Since the 1970s, the N.H. Fish and Game Department has been conducting winter angler creel surveys of rainbow smelt and monitoring spring smelt egg deposits. Biologists have also been surveying juvenile smelt using seine nets -- nets that hang vertically in the water - while the fish are in estuarine waters. And now, with help from the National Oceanic and Atmospheric Administration, N.H. Fish and Game and its counterparts in Maine and Massachusetts are taking a close look at smelt habitat and conditions. The intent is to understand why smelt numbers have shown little increase since the 1970s.

#### **Life is tough for a migratory fish**

The smelt's dependency on both saltwater and freshwater puts it in a class with other migratory fish, including alewife and blueback herring (river herring), Atlantic salmon, American shad, American eel, Atlantic sturgeon and sea lamprey. They all migrate between freshwater and saltwater (though only the eel spawns in saltwater), and they face similar challenges, including dams, overfishing, changing climate and pollution from the land and air. Locally, extensive logging of the past and subsequent sawdust from mills increased siltation and lowered water quality, which hurt fish reproduction.

Recently, much effort has been made to restore habitat that supports migratory fish. A host of partners, including N.H. Fish and Game, the University of New Hampshire, dam owners, New Hampshire Coastal Program and others have begun restoration efforts such as constructing fish ladders, removing dams, and improving tidal flows into salt marshes. Sadly, effective restoration may have come too late for Atlantic salmon and Atlantic sturgeon, which are virtually extinct in New Hampshire coastal waters.

Helping to spur renewed interest in restoring migratory fish is a new report put out by The Nature Conservancy, with help from the New Hampshire Estuaries Project, the New Hampshire Coastal Program and the University of New Hampshire. The Great Bay Estuary Restoration Compendium helps conservationists identify and prioritize restoration projects based on ecological factors. In addition to migratory fish, the document also describes restoration opportunities for salt marsh, eel grass and shellfish. These species and habitats are arguably the most important in terms of the estuary's ecological function, and their restoration will improve migratory fish reproduction.

Hopefully, these efforts will succeed in improving and sustaining the ecological health of Great Bay and its tributaries so that the colorful bob houses will continue to mark the season of smelt.

Eye on our Estuaries is an educational column initiated by the New Hampshire Estuaries Project about coastal watershed issues. The NHEP is a collaborative program involving governmental agencies, universities, nonprofit organizations, businesses and the public to protect, enhance and monitor the environmental quality of the state's coastal bays and rivers. NHEP is funded in part by a grant from the U.S. Environmental Protection Agency. For details, visit [www.nhep.unh.edu](http://www.nhep.unh.edu).

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