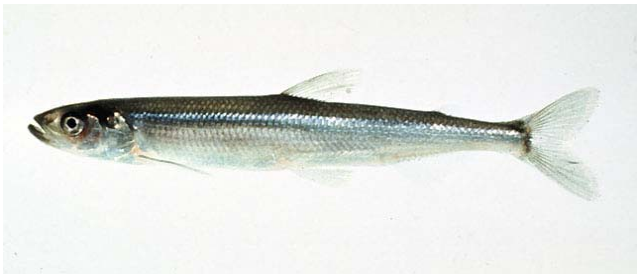
Common Name: **Rainbow smelt**
Scientific Name: *Osmerus mordax*
Area of Concern: Found in rivers and coastal areas of eastern North America from Labrador to New Jersey and on the west coast from Vancouver Island around Alaska to the Arctic Ocean (NS Dept of Agriculture, 2002).
Year First Listed as a "Species of Concern": 2004



(photo credit: J.F. Scarola)

Species Description:

Life history: Small, slender, elongated fish averaging 6-8 inches in length. Sea-dwelling populations are anadromous. Some populations are found entirely in fresh water. Have been introduced into freshwater systems in the northeastern and central U.S. (Rainbow Smelt general information 2002). They are pelagic, usually traveling in schools less than 1 mile from shore and in water less than 19 ft deep (Rainbow Smelt general information, 2002). There is evidence of migrations in the sea, however, little is known about this part of the smelt life history (Collette and MacPhee 2002).

Spawning takes place in late winter/early spring in the southern portion of this species range and in mid-spring farther north. Spawning is believed to be triggered by photoperiod rather than water temperature (Collette and MacPhee 2002). A female smelt can produce 7000 to over 75,000 eggs depending on size (Collette and MacPhee 2002).

Smelt are carnivorous and voracious feeders of amphipods, euphausiids, mysids, shrimps, and marine worms, and as they grow, any small fish that are available (Collette and MacPhee 2002).

Smelt are a major prey item for striped bass, bluefish and a variety of bird species. Mortality due to predation is quite high for this species: up to 72% of adult fish die annually (Rainbow Smelt general information, 2002). In addition, smelt are preyed upon by their own species (Collette and MacPhee 2002).

Habitat: Summer habitat varies with water temperature. Smelt leave the harbors and estuaries of Massachusetts Bay for slightly deeper and cooler water during the summer (Collette and MacPhee 2002). Farther north, east of Penobscot Bay, they remain in harbors, bays, and river mouths all summer (Collette and MacPhee 2002). Smelt overwinter in nearshore waters prior to making their spawning runs.

Rationale for "Species of Concern" Listing:

Demographic and Diversity Concerns:

Massachusetts Bay fisheries have recently declined. During the last 15-20 years there has been a region wide trend in declining smelt populations. Fishing and natural mortality rates of smelt are not known (Chase and Childs, 2001). Collette and MacPhee (2002) note that enough smelt still remain to provide sport fishing for thousands of anglers; this applies equally to many locations along the coast of Maine and in Great Bay New Hampshire.

Many inland populations appear to be declining, apparently due in part to the impacts of acid precipitation.

Factors for Decline:

In Maine, they are prized food fish harvested in 3 distinct fisheries. Fishermen use dip nets to catch them. In fall, a riverine and coastal bay hook and line fishery is supported (Maine DMR Recreational Fisheries Program, 2002).

For over 100 years smelt have supported a successful commercial fishery and have been caught in sport fisheries. They are eagerly pursued along the coast and also during spawning migrations to rivers and estuaries

(Collette and MacPhee 2002). Commercial landings peaked in 1966 at 162.8 mt with the majority being landed from Maine (115.6 mt). Landings declined over the next 22 years with a low in 1988 of 1.3 mt. In the early 1990s, landings increased slightly to a high of 27.1 mt in 1992. However, a declining trend has again been evident, and landings have averaged only 0.14 mt since 1998. In 2001, total U.S. landings were 0.1 mt with all fish reported as being landed from New Hampshire waters.

Chase and Childs (2001) note that fishing mortality is not suspected to be a major influence in smelt population dynamics in Massachusetts due to the absence of a commercial fishery and very little catch and effort involved in the sport fishery. Populations and fisheries are not assessed (Brad Chase MADMF, pers. comm. 2003).

Factors contributing to the declining trend in this species are not well identified. Two concerns identified for many rivers in Massachusetts Bay are structural impediments to spawning habitat, and chronic degradation of spawning habitat from stormwater inputs (Chase and Childs, 2001). Declines in anadromous smelt are primarily due to damming and siltation (The smelt family Osmeridae, 2002).

In Massachusetts the fishery is closed by regulation from March 15th to June 15th to protect spawning fish (Chase and Childs, 2001).

Massachusetts has a monitoring program, which looks at spawning habitat. There have been a number of projects in recent years involving restoration of habitat (Brad Chase MADMF, pers. comm. 2003.)

Status Reviews/Research Completed or Underway:

For further information on this Species of Concern, or on the Species of Concern Program in general, please contact Ms. Marta Nammack, NMFS, Office of Protected Resources, 1315 East West Highway, Silver Spring, MD 20910, (301) 713-1401, x180, Marta.Nammack@noaa.gov; or Kimberly Damon-Randall, NMFS, Northeast Region, One Blackburn Drive, Gloucester, MA 01930-2295, (978) 281-9328, x6535, Kimberly.Damon-Randall@noaa.gov.

References:

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