Damming and lost connectivity for fish in northeastern ecosystems

July 19 2017

Anadromous forage fish, which spawn in freshwater but spend much of their lives at sea, are an important food source for many species. They also play a major role in how freshwater ecosystems function. Despite their importance for ecosystems, many of these fish exist at only a tiny fraction of their previous populations. Writing in *BioScience*, Steven Mattocks of the University of Massachusetts, in Amherst, and his colleagues outline the effects of lost habitat and river connectivity for these crucial fish.

The authors find that current Northeastern freshwater systems are greatly diminished, operating at only about 6.7% of their past capacity to support anadromous alewife biomass and abundance. Historically, these species had the ability to transport nutrients as a "function of their biomass, home-range size, and dispersal distance." However, the authors now report, migrations have "long been disrupted by fragmented landscapes" caused by dams and other interference.

Mattocks and his colleagues are quick to point out that the problem is not a new one. Indeed, "the earliest documented human-constructed structure that obstructed migratory fish in North America... was built in coastal Massachusetts on the Charles River in 1632." Damming continued apace, leaving few intact flows that allow migration between inland waters and the sea.

To overcome these challenges, the authors propose re-linking freshwater and marine systems, physically and in terms of management. This, they

argue, will restore the historical migration paths of alewife and other ecologically important species: "It is time for a more holistic vision of aquatic biodiversity conservation and fisheries management, one that crosses barriers that are, ironically, of our own construction."

More information: Steven Mattocks et al. Damming, Lost Connectivity, and the Historical Role of Anadromous Fish in Freshwater Ecosystem Dynamics, *BioScience* (2017). DOI: 10.1093/biosci/bix069