

## Slipping away? What can glass eel stages tell us about the decline of the American eel (*Anguilla rostrata*) in Middle Atlantic Bight estuaries?

R/6640-002

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### *Research Summary*

Commercial catches, trawl/seine surveys, and upstream passage counts indicate numbers of American eels (*Anguilla rostrata*) are dropping at an alarming rate in multiple regions throughout North America. In fact, population estimates are so dire that the American eel is currently being petitioned for inclusion on the endangered species list. Eel populations in New Jersey mirror these concerns. Eels are critical components of local estuarine ecosystems as well as an important source of bait for recreational fishermen, yet their numbers have fallen over the last two decades. Despite these warning signs, the early life of the American eel remains poorly understood, thus it is difficult to accurately determine its status.



Adult eels migrate out of North American rivers and streams to reproduce in the Sargasso Sea, yet their oceanic young (called "leptocephalus" eels) have remained elusive to scientists. Thus, transformed "glass eels" entering estuaries, including those in New Jersey, represent a first glimpse into American eel early life history. Unfortunately, little is known about long-term trends in glass eel numbers, how their distribution varies in

space and time, as well as the environmental factors influencing arrival. Because the abundance and size of young fishes entering estuaries may function as indicators of population health, information related to the arrival of early stage eels is critical for validating the reported declines in the stock.



The primary objectives of this 2-year project on American eel early life history are centered around three themes: (1) Quantifying glass eels entering the Mullica River–Great Bay estuary using long-term data sets and expanded local sampling; (2) Evaluating the consistency of patterns across two river systems (Mullica River–Great Bay, Great Egg Harbor estuaries) in southern New Jersey using arrays of glass eel collectors; and (3) Conducting analyses into the environmental cues moderating variability in glass eel supply using long-term data sets and two years of expanded collections. Given the lack of available data, this information is highly relevant to the biology and management of local eel fisheries along the entire U.S. east coast. In New Jersey alone, this research will help address concerns by recreational fishermen who rely on eels as bait for the economically important striped bass fishery.