

## An unwelcome guest? Is the presence of the invasive swim bladder parasite, *Anguillicola crassus*, influencing American eel (*Anguilla rostrata*) recruitment in New Jersey estuaries? - R/6848-0001

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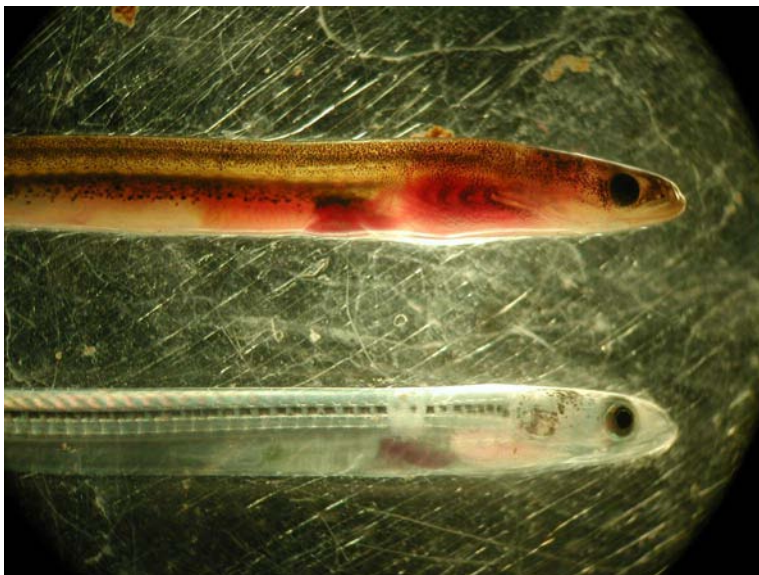
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### Research Summary

The American eel (*Anguilla rostrata*) is a critical component of New Jersey ecosystems and an important source of bait for recreational fishers, yet the species is thought to be in decline over portions of its range. Recently, the

causes of this decline have been the focus of a US Fish and Wildlife Service technical review, a stock assessment by the Atlantic States Marine Fisheries Commission and a US Endangered Species Act petition. Although not warranting endangered status, this migratory species faces an array of threats during its freshwater residency period before returning to the Sargasso Sea to spawn.

During this critical period, American eel juveniles are exposed to a recent addition to New Jersey estuaries, the invasive swim bladder parasite *Anguillicola crassus*. Originally native to Asia and Europe, this nematode species is contracted when an eel consumes an intermediate host carrying its early stage juveniles. Within the confines of the swim bladder, mature *Anguillicola crassus* feed on the infected eel's blood supply and deposit eggs which are flushed back into the estuarine environment. Acquisition of *Anguillicola crassus* has been shown to induce damage to swim bladder tissue, which may eventually compromise the



(Over)



migration of older individuals back to the spawning grounds.

The main goal of this multi-institutional project is to quantify the spread of *Anguillicola crassus* in New Jersey estuaries, with an emphasis on eel early life. Documenting the pattern of infection includes quantifying the prevalence/intensity of infection over a range of estuaries and estuarine habitats, as well as its rates and routes. However, a critical goal is to test the biological consequences of infection on organism health and, by extension, recruitment, via environmental metabolomics (an emerging field that measures the metabolic response of an organism to natural and anthropogenic stressors by assessing organism function at the molecular level).

