

Florida Fish Busters

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The American Eel—icky or wow?

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My first close encounters with American eel came three decades ago when I was a graduate student. The more I learned about these allegedly slimy, snake-like fish, the more fascinated I became.



While cramming for one of my first undergraduate ichthyology (study of fishes) classes, I had to learn the rather vague definition for fish: “Fishes are cold-blooded animals, typically with backbones, gills and fins, and are primarily dependent on water as a medium in which to live.” What struck me as a very convoluted definition soon became a source of fascination as I learned about the diversity of fishes that exist in the world—some without fins, scales, or functioning gills and many with cartilage for skeletons. With more than 20,000 known species and maybe just as many yet to be described, there is a fascinating diversity—and the American eel is one of the most fantastic.

My original research was to help commercial fishermen and aquaculturists (fish farmers) take advantage of an economic opportunity associated with the high demand for eels in Japan and Europe where they are a delicacy. Although not a

highly popular fish in America, they are frequently smoked and are found in sushi bars everywhere, plus anglers find small eels to be great bait fish.

Eels are now listed as endangered in Europe and Japan, and, in 2007, the U.S. Fish and Wildlife Service concluded a wide ranging research project to determine if they should receive special protection here. Due, in part, to the fish's huge range, which extends from Greenland to Brazil, their ability to move inland as far as the Great Lakes and Mississippi River and their overall abundance, it was decided they did not need special protection at this time. Although populations in the St. Lawrence River and Lake Champlain have declined, Florida populations still seem adequate. The commercial eel fishery in Florida primarily targets adult eels using 'eel pots.' However, in 2006, only 11 permits were issued for commercial harvest of eels in Florida, and the total harvest was approximately 1,250 pounds, a value of around \$5,000. As a result of this minimal commercial harvest and very little targeted recreational angling for eels (although anglers do take them incidentally), overfishing does not appear to be a problem in Florida. Other more widespread threats to this species still exist, which include large-scale oceanographic changes, habitat degradation, presence of hydroelectric dams, and the introduction of an exotic swimbladder parasite.

American eels are one of 16 species of eels that evolved over 50 million years ago and are 'facultatively catadromous,' which means they typically spawn in salt water but grow up in fresh water (some may spend their entire life in salt water). American eels begin their life in the Sargasso Sea, which is named for a type of

seaweed that is found there and is surrounded by major oceanic currents. It is the only 'sea' not bordered by land and is saltier than average seawater. There, both American and European eels spawn and die. The fertilized eggs hatch into somewhat typical looking fish larvae with a yolk-sac, but then a metamorphosis begins. Each larva transforms into a flattened, semi-transparent, leaf-shaped 'leptocephalus.' They then begin floating with the currents and feeding on microscopic animals until they reach areas influenced by fresh water. At that point, they change again, still nearly transparent, into 'glass eels.' During this brief phase, they swim actively towards the fresh water source without feeding and lose weight. Once in an estuary, they again change taking on pigment and beginning to feed again—now being called 'elvers' or 'pencil eels' depending on their size. As these fish move further up river, they find favorable habitats in rivers, lakes or swamps and feed on bottom organisms—mostly invertebrate insects, snails and mollusks.



These eels are the ones most anglers encounter and are variously called 'yellow or brown eels.' They can grow to longer than four feet and weigh more than 16 pounds, although the rod-and-reel record is 9.25 pounds. They have a very long dorsal (back) and anal (belly) fins that are continuous with the caudal (tail) fin. The pectoral (shoulder) fins are well developed, but they lack pelvic (hip) fins. Although very flexible, they have a bony spine composed of more than a hundred vertebrae. They

may feel scaleless, but the skin actually has tiny embedded scales which make tanned skins very durable.

The eel's transformational journey isn't over yet. After living as long as 40 years in fresh water, they respond to unknown stimuli and return to the Sargasso Sea for their once-in-a-lifetime communal spawning and die. During their return trip to the Sea, they undertake one more miraculous makeover, becoming silver eels. Silver eels don't feed, and their eyes greatly enlarge and digestive tract begins to break down as the gonads expand. Finally, completing the life cycle of a very intriguing fish, an average female releases approximately 5 million eggs, which are fertilized externally and the cycle begins anew.

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