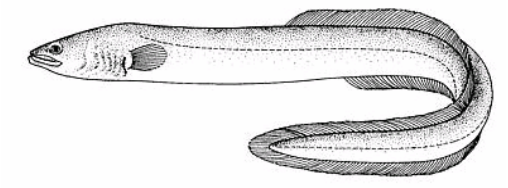

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American Eel

by

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Distribution, Biology and Management

American eels, *Anguilla rostrata*, are distributed in the Atlantic Ocean from Greenland to Brazil. Along the Atlantic coast of the United States, eels between Maine and Florida are considered part of a single management unit (Figure 28.1). American eels are members of the family Anguillidae and are closely related to the European eel, *Anguilla anguilla.* Both species spawn in the Sargasso Sea, a warm water area in the middle of the North Atlantic between the Azores and West Indies. American eel larvae spend 9 to 12 months as leptocephali during which time they are transported by the Gulf Stream into coastal U.S. waters. At approximately 60 mm in length, the larvae develop into the first juvenile phase, called glass eels, and migrate into coastal estuaries. As the glass eels grow and become pigmented, they develop into elvers. Elvers may migrate upstream to freshwater or remain in marine estuaries but subsequently develop into sexually immature adults, known as yellow eels. Yellow eels remain in this stage of maturity for as few as 3 or as many as 20-plus years. Maturity appears to be a function of size rather than age, therefore faster growing individuals mature earlier. Maximum size is approximately 130 cm for females but only 60 cm for males. Although American eels were classified as the only catadromous species in North America, the species is now considered to exhibit facultative catadromy as individuals move into freshwater systems only under favorable conditions. The freshwater distribution of eels is influenced by sex as males tend to remain in estuaries while females migrate upriver. Upon reaching maturity, eels migrate out of the freshwater or estuary systems and return to the Sargasso Sea to spawn. Prior to their long ocean return migration to the spawning grounds, eels undergo significant physical changes , such as enlargement of the eyes and pectoral fins, changes in visual pigmentation and changes in body coloration (to what is known as the silver phase). Additionally, eels cease feeding and the gut begins to degenerate. Although spawning has never been observed, eels are believed to die after spawning.

American eels are managed under an interstate fishery management plan developed by the Atlantic States Marine Fisheries Commission (ASMFC) and implemented in 2001. Management regulations vary by state and involve size limits, reporting requirements, gear restrictions and possession limits in both the commercial and recreational fisheries.

The Fishery

Total commercial landings along the U.S. Atlantic coast in 2005 were 427 mt, an increase from 324 mt in 2004 (Table 28.1, Figure 28.2). Recent landings are markedly lower than in the 1970s and early 1980s, when landings frequently exceeded 1,000 mt and peaked at over 1,800 mt in 1979. Commercial fisheries have historically occurred from Maine to Florida and have been directed at all life stages of eel, from glass eel through silver eel. Recent changes in size regulations have eliminated the glass eel fishery in all states except Maine and Florida, with significant harvests in Maine only. Generally commercial fisheries target yellow eels in rivers and estuaries using pot gear or fyke nets and market the catch in Europe and Asia. . Recreational landings of American eel since 1981 have ranged from less than 1 mt to 71 mt, generally accounting for less than 1% of total eel landings (Figure 28.2). U.S. recreational harvest in 2005 were slightly more than 1 mt. Eel catches in the recreational fishery are generally incidental to other targeted species.

Research Vessel Survey Indices

American eels rarely occur in NEFSC surveys. Several state fisheries agencies conduct surveys targeting glass eels during upriver migrations. Fishery independent indices are also produced from either incidental catches of yellow eels in tidal estuaries or directed pot surveys of yellow eels. A preliminary analysis of the suite of indices indicates a strong downward trend in abundance (ASMFC 2006a and 2006b); however an analytical assessment of Atlantic coast eel stocks has not been completed.

Summary

Total American eel landings declined markedly from 1979 until 1996, and have since remained relatively low but stable at around 400 mt. Resource abundance has declined, due to a combination of habitat losses (such as blocked passages in both upriver and downstream migrations), over-exploitation, exposure to lethal contaminants, and changes in natural mortality. American eel stocks along the U.S. Atlantic coast underwent a status review in 2005 in response to a petition to list the species as threatened or endangered under the Endangered Species Act of 1973. The results of the status review are still pending.

Table 28.1 Recreational and commercial landings of American eel (thousand metric tons).

Category	1986-95 Average	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
U. S. Recreational	-	-	-	-	-	-	-	-	-	-	-
Commercial											
United States	-	0.5	0.4	0.5	0.5	0.4	0.4	0.3	0.5	0.3	0.4
Canada	-	-	-	-	-	-	-	-	-	-	-
Other	-	-	-	-	-	-	-	-	-	-	-
Total Nominal Catch	-	0.5	0.4	0.5	0.5	0.4	0.4	0.3	0.5	0.3	0.4

For further information

ASMFC. 2006a. Terms of Reference and Advisory Report to the American Eel stock assessment peer review. ASMFC Stock Assessment Report 06-01. 23 p.

ASMFC. 2006b. 2006 review of the Atlantic States Marine Fisheries Commission Fishery Management Plan for American Eel (*Anguilla rostrata*). http://www.asmfc.org/ .

Collette, B.B. and G. Klein-MacPhee (ed.). 2002. Bigelow and Schroeder's Fishes of the Gulf of Maine. 3rd edition. Smithsonian Inst. Press. Washington, D.C. 748 p.

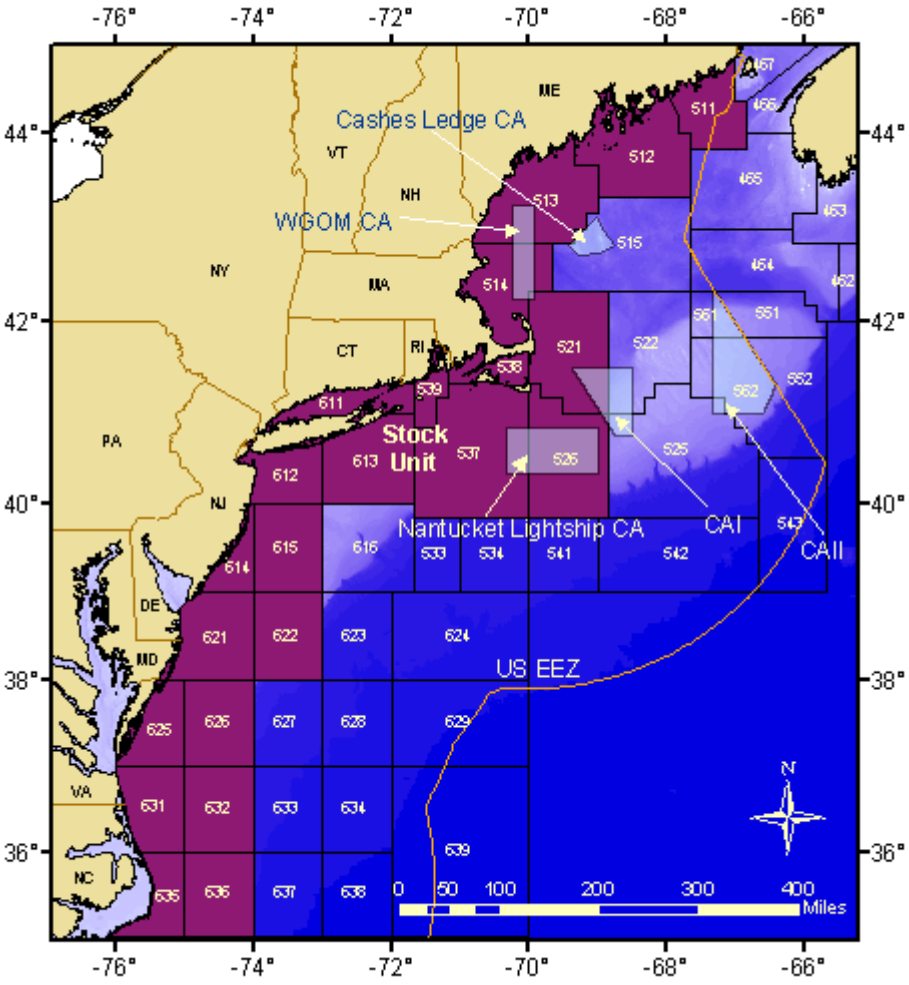

Figure 28.1. Statistical areas used to define the American eel stock.

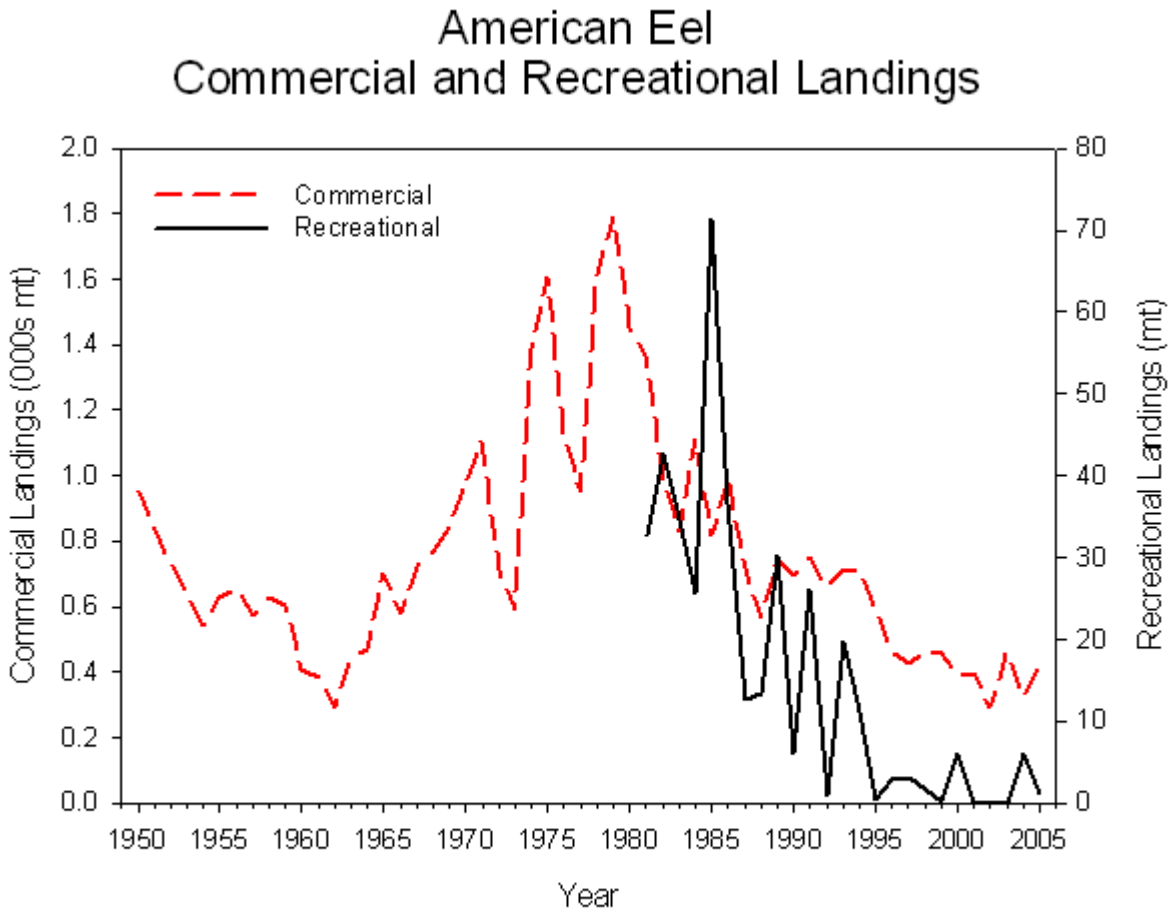

Figure 28.2. Commercial and recreational landings of American eel in the U.S. Atlantic waters.