

American Plaice – *Hippoglossoides platessoides*

Overall Vulnerability Rank = Low ■

Biological Sensitivity = Low ■

Climate Exposure = High ■

Data Quality = 88% of scores ≥ 2

<i>Hippoglossoides platessoides</i>		Expert Scores	Data Quality	Expert Scores Plots (Portion by Category)	
Sensitivity attributes	Stock Status	3.0	3.0		
	Other Stressors	1.2	1.6		
	Population Growth Rate	2.5	2.6		
	Spawning Cycle	2.1	2.9		
	Complexity in Reproduction	1.6	2.7		
	Early Life History Requirements	2.2	2.5		
	Sensitivity to Ocean Acidification	2.1	2.5		
	Prey Specialization	1.9	2.8		
	Habitat Specialization	1.1	2.4		
	Sensitivity to Temperature	1.8	2.8		
	Adult Mobility	2.4	2.6		
	Dispersal & Early Life History	1.4	2.7		
	Sensitivity Score		Low		
	Exposure variables	Sea Surface Temperature	3.9	3.0	
Variability in Sea Surface Temperature		1.0	3.0		
Salinity		1.1	3.0		
Variability Salinity		1.2	3.0		
Air Temperature		1.0	3.0		
Variability Air Temperature		1.0	3.0		
Precipitation		1.0	3.0		
Variability in Precipitation		1.0	3.0		
Ocean Acidification		4.0	2.0		
Variability in Ocean Acidification		1.0	2.2		
Currents		2.1	1.0		
Sea Level Rise		1.1	1.5		
Exposure Score		High			
Overall Vulnerability Rank		Low			

American Plaice (*Hippoglossoides platessoides*)

Overall Climate Vulnerability Rank: **Low** (36% certainty from bootstrap analysis).

Climate Exposure: **High**. Two exposure factors contributed to this score: Ocean Surface Temperature (3.9) and Ocean Acidification (4.0). All life stages of American Plaice use marine habitats.

Biological Sensitivity: **Low**. One sensitivity attributes scored above 2.5: Stock Status (3.0). The Stock is overfished, but not currently undergoing overfishing (O'Brien, 2006).

Distributional Vulnerability Rank: **High** (100% certainty from bootstrap analysis).

Directional Effect in the Northeast U.S. Shelf: The effect of climate change on American Plaice on the Northeast U.S. Shelf is very likely to be negative (>95% certainty in expert scores). Warming may decrease productivity and may cause reductions in available habitat.

Data Quality: 88% of the data quality scores were 2 or greater indicate that data quality is moderate.

Climate Effects on Abundance and Distribution: There is relatively little information regarding the effect of climate factors on American Plaice. Brodziak and O'Brien (2005) found a link between recruitment and NAO but the relationship was curvilinear. In terms of distribution, American Plaice have not shifted latitudinally, but have increased in depth (Nye et al., 2009).

Life History Synopsis: American Plaice is a cold-water (-1.5-13 °C), benthic, marine species occurring on both sides of the North Atlantic Ocean, ranging from Labrador to New York in the western Atlantic (Johnson et al., 1999; Johnson, 2004). Temperature can have a significant effect on the growth and maturity of the species, but plaice are generally mature by 4 years (Johnson et al., 1999; Johnson, 2004; O'Brien, 2006). Mature fish spawn on the sea floor in 3-6°C water at depths <90 m, and make short migrations from offshore if necessary (Johnson et al., 1999; Klein-MacPhee, 2002; Johnson, 2004). Plaice are batch spawners over a roughly 26-day period between January and August, peaking in spring (Johnson et al., 1999; Klein-MacPhee, 2002; Johnson, 2004). The resultant eggs are pelagic and generally retained within the 100m isobath (Klein-MacPhee, 2002; Johnson, 2004). Incubation lasts approximately 2 weeks (Johnson et al., 1999; Klein-MacPhee, 2002; Johnson, 2004). Larvae drift near the surface for 3-4 months (varying by temperature) eating diatoms and copepods (Johnson et al., 1999; Klein-MacPhee, 2002; Johnson, 2004). Metamorphosis is complete by 30 - 40 mm, and is temperature dependent (Johnson et al., 1999; Johnson, 2004). Juveniles settle to the bottom and eat small shrimps, crustaceans, polychaetes, and by 41-45 cm concentrate more on echinoderms (Johnson et al., 1999; Klein-MacPhee, 2002; Johnson, 2004). Juvenile and adult American Plaice are mostly sedentary on soft bottom substrate, but make short migrations for food and spawning (Johnson et al., 1999; Klein-MacPhee, 2002; Johnson, 2004). Adult American Plaice are opportunistic predators on small bottom-dwelling organisms such as echinoderms (brittle stars), bivalves, polychaetes, and small crustaceans (Johnson et al., 1999; Klein-MacPhee, 2002; Johnson, 2004). Atlantic Cod are the dominant predator of American Plaice <35 cm (Johnson et al., 1999; Johnson, 2004). The primary predators of adult American Plaice include larger predatory fish and mammals such as Greenland Shark, Monkfish (Goosefish), Spiny Dogfish, and grey seals (Johnson et al., 1999; Klein-MacPhee, 2002; Johnson, 2004). American Plaice are managed under the Greater Atlantic Regional Fisheries Office, Northeast Multispecies Fishery Management Plan to rebuild stocks to target biomass levels (Johnson et al., 1999; O'Brien, 2006). The Stock is overfished, but not currently undergoing overfishing (NEFSC 2012).

Literature Cited:

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