

Atlantic Saury – *Scomberesox saurus*

Overall Vulnerability Rank = Low ■

Biological Sensitivity = Low ■

Climate Exposure = High ■

Data Quality = 67% of scores ≥ 2

<i>Scomberesox saurus</i>		Expert Scores	Data Quality	Expert Scores Plots (Portion by Category)		
Sensitivity attributes	Stock Status	1.8	1.2		<div style="display: flex; flex-direction: column; align-items: flex-start;"> <div style="width: 10px; height: 10px; background-color: green; margin-bottom: 5px;"></div> Low <div style="width: 10px; height: 10px; background-color: yellow; margin-bottom: 5px;"></div> Moderate <div style="width: 10px; height: 10px; background-color: orange; margin-bottom: 5px;"></div> High <div style="width: 10px; height: 10px; background-color: red; margin-bottom: 5px;"></div> Very High </div>	
	Other Stressors	1.4	1.6			
	Population Growth Rate	1.3	2.1			
	Spawning Cycle	2.1	1.8			
	Complexity in Reproduction	1.9	1.4			
	Early Life History Requirements	2.3	1.6			
	Sensitivity to Ocean Acidification	1.4	2.0			
	Prey Specialization	1.2	2.4			
	Habitat Specialization	1.1	2.2			
	Sensitivity to Temperature	2.0	2.2			
	Adult Mobility	1.5	2.2			
	Dispersal & Early Life History	1.4	1.6			
	Sensitivity Score		Low			
	Exposure variables	Sea Surface Temperature	4.0	3.0		
Variability in Sea Surface Temperature		1.4	3.0			
Salinity		2.4	3.0			
Variability Salinity		1.2	3.0			
Air Temperature		1.1	3.0			
Variability Air Temperature		1.0	3.0			
Precipitation		1.0	3.0			
Variability in Precipitation		1.1	3.0			
Ocean Acidification		4.0	2.0			
Variability in Ocean Acidification		1.0	2.2			
Currents		2.5	1.0			
Sea Level Rise		1.0	1.5			
Exposure Score		High				
Overall Vulnerability Rank		Low				

Atlantic Saury (*Scomberesox saurus*)

Overall Climate Vulnerability Rank: **Low** (100% certainty from bootstrap analysis).

Climate Exposure: **High**. Two exposure factors contributed to this score: Ocean Surface Temperature (4.0) and Ocean Acidification (4.0). Exposure to ocean surface temperature and ocean acidification occurs during all life stages.

Biological Sensitivity: **Low**. All sensitivity scores were below 2.5.

Distributional Vulnerability Rank: **Very High** (40% certainty from bootstrap analysis). Three of the attributes indicated vulnerability to distribution shift. Atlantic Saury are habitat generalists and occur in pelagic habitats both on and off the continental shelf. They are highly mobile and make large seasonal migrations. Spawning occurs in slope waters and larvae have the potential to be broadly dispersed.

Directional Effect in the Northeast U.S. Shelf: The effect of climate change on Atlantic Saury on the Northeast U.S. Shelf is estimated to be positive, but this estimate is highly uncertain (<66% certainty in expert scores). Warming may increase available habitat on the Northeast U.S. Shelf and a northward shift in the Gulf Stream may result in more Atlantic Saury on the shelf. However, the data quality for Atlantic Saury is low reducing confidence in understanding of distribution and abundance.

Data Quality: 67% of the data quality scores were 2 or greater.

Climate Effects on Abundance and Distribution: There is relatively little information available regarding climate effects on Atlantic Saury. The abundance of Pacific Saury (*Cololabis saira*) in the northwestern Pacific is correlated to temperature (Tian et al., 2003). A change in distribution in the East/Japan Sea in the 1970s has been linked to an increase in temperature (Zhang and Gong, 2005). Tseng et al. (2011) projected a poleward shift in Pacific Saury under different future warming scenarios based on a habitat model, and Ito et al. (2013) projected a decrease in growth under different climate scenarios using an ecosystem-based bioenergetic model. If parallels exist for Atlantic Saury, a decrease in productivity and a northward shift in distribution may occur with climate change.

Life History Synopsis: Atlantic Saury is an epipelagic, open-ocean, forage fish species found from offshore of Cape Hatteras, North Carolina, to Newfoundland out to 40° W (Collette, 2002). Atlantic Saury mature at age 2, and most spawning results from fish aged 2-3 years (Collette, 2002). Spawning occurs south of the Gulf Stream frontal zone in winter and spring (Collette, 2002). Saury are likely batch spawners (Dudnik et al., 1981). Eggs and larvae are epipelagic in the upper 1 m of the open ocean (Dudnik et al., 1981). Incubation of the eggs takes more than 2 weeks (Collette, 2002). Little is known about the larval stage. Adult Atlantic Saury also occur in the warm surface waters of the open sea, west of the Gulf Stream core, but may go as deep as 50 m during the day (Dudnik et al., 1981). Seasonal along- and cross-shelf migrations take Atlantic Saury from the waters well offshore of Cape Hatteras, North Carolina, in winter to continental shelf waters, such as the Gulf of Maine, Georges Bank, and Scotian Shelf, in summer and fall (Dudnik et al., 1981). Atlantic Saury is a planktivorous species, and feeds mainly on siphonophores, copepods, euphausiids, and amphipods (Collette, 2002). A variety of predators, including squids, Swordfish, marlins, sharks, tunas, hakes, Atlantic Cod, Pollock, dolphins, whales, and birds, feed on the abundant, open-ocean prey species (Collette, 2002). There is no directed fishery for the species in the western Atlantic, but Atlantic Saury is an important food fish in other parts of the world (Collette, 2002).

Literature Cited:

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