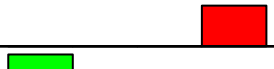
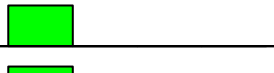
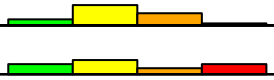
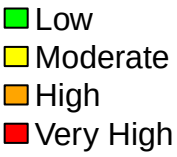
Conger Eel − *Conger oceanicus*

Overall Vulnerability Rank = High

Biological Sensitivity = Moderate
Climate Exposure = Very High
Data Quality = 62% of scores ≥ 2

| | *Conger oceanicus* | Expert Scores | Data Quality | Expert Scores Plots (Portion by Category) |
|---|---|---|---|---|
| Sensitivity attributes | Stock Status | 2.4 | 0.5 |  |
| | Other Stressors | 2.5 | 1.2 |  |
| | Population Growth Rate | 2.1 | 0.8 |  |
| | Spawning Cycle | 2.9 | 2.4 |  |
| | Complexity in Reproduction | 2.4 | 1.9 |  |
| | Early Life History Requirements | 2.5 | 1.8 |  |
| | Sensitivity to Ocean Acidification | 1.2 | 1.3 |  |
| | Prey Specialization | 1.6 | 2.1 |  |
| | Habitat Specialization | 2.4 | 3.0 |  |
| | Sensitivity to Temperature | 1.6 | 2.8 |  |
| | Adult Mobility | 1.5 | 1.8 |  |
| | Dispersal & Early Life History | 1.3 | 2.8 |  |
| | Sensitivity Score | Moderate | | |
| Exposure variables | Sea Surface Temperature | 4.0 | 3.0 |  |
| | Variability in Sea Surface Temperature | 1.0 | 3.0 |  |
| | Salinity | 2.4 | 3.0 |  |
| | Variability Salinity | 1.2 | 3.0 |  |
| | Air Temperature | 4.0 | 3.0 |  |
| | Variability Air Temperature | 1.0 | 3.0 |  |
| | Precipitation | 1.3 | 3.0 |  |
| | Variability in Precipitation | 1.4 | 3.0 |  |
| | Ocean Acidification | 4.0 | 2.0 |  |
| | Variability in Ocean Acidification | 1.0 | 2.2 |  |
| | Currents | 2.2 | 1.0 |  |
| | Sea Level Rise | 2.4 | 1.5 |  |
| | Exposure Score | Very High | | |
| Overall Vulnerability Rank | | High | | |



**Conger Eel (*Anguilla oceanica*)**

Overall Climate Vulnerability Rank: **High** (93% certainty from bootstrap analysis).

Climate Exposure: **Very High**. Three exposure factors contributed to this score: Ocean Surface Temperature (4.0), Ocean Acidification (4.0) and Air Temperature (4.0). Conger Eel are semelparous: spawning in the ocean, developing in marine and estuarine habitats, then feeding growing, and maturing in marine and estuarine habitats.

Biological Sensitivity: **Moderate**. Three sensitivity attributes scored above 2.5: Spawning Cycle (2.9), Other Stressors (2.5), and Early Life History Requirements (2.5). Conger Eel found in coastal waters and are exposed to a number of other stressors including habitat destruction, blockage to spawning habitats, and contaminants (Limburg and Waldman, 2009). Conger Eel migrate to specific areas in the Sargasso Sea to spawn, specialized larval stages – leptocephali – disperse and enter shelf and coastal areas throughout North American while undergoing metamorphosis.

Distributional Vulnerability Rank: **High** (100% certainty from bootstrap analysis). Two attributes indicated vulnerability to distribution shift. Conger Eel larvae are widely dispersed over much of the North Atlantic and adults are highly mobile returning to the Sargasso Sea from shelf and coastal systems along most of the North American coast.

Directional Effect in the Northeast U.S. Shelf: The effect of climate change on Conger Eel is estimated to be neutral, but this estimate has uncertainty (66-90% certainty in expert scores). Conger Eel is found in a range of habitats and it is unclear the effect of climate change on population productivity and distribution. However, Conger Eel spawn in the Sargasso Sea, so shifts in the Gulf Stream have the potential to effect larval dispersal, survival, and potentially recruitment, but the direction and magnitude of these effects are unclear. The effect of ocean acidification over the next 30 years is likely to be minimal.

Data Quality: 62% of the data quality scores were 2 or greater indicate that data quality is moderate.

Climate Effects on Abundance and Distribution: The ecology of Conger Eel is not well understood and little work has been done examining links between climate factors and Conger Eel abundances and distribution. Conger Eel occur across a wide range of habitats from estuaries to the shelf break (Hood et al., 1988) so climate effects are likely to be complicated.

Life History Synopsis**:** The Conger Eel is a marine species which spawns in the Sargasso Sea and uses the continental shelf, from estuaries to the shelf break, for nursery and adult habitat (McCleave and Miller, 1994). Adult eels range from Massachusettes to Florida and the eastern Gulf of Mexico (Smith and Tighe, 2002). In late October to mid-December, congers migrate from the shelf to the Sargasso Sea between the subtropical convergence zone in the north and the Bahamas and Antilles in the south seeking the sharp change in temperature of the oceanic front to trigger spawning (McCleave and Miller, 1994). Like many other eel species, Conger Eels are mostly likely semelparous and die after spawning (Able and Fahay, 2010). Eggs hatch into ribbon-like, pelagic leptocephalus larvae (Able and Fahay, 2010). During the 2-4 months between hatching and the onset of metamorphosis (Correia et al., 2004), Conger Eel leptocephali are capable swimmers, able to swim from the Gulf Stream to estuarine and near-shore habitat (Smith and Tighe, 2002; Wuenschel and Able, 2008). Most Conger Eels reach estuarine and coastal areas as 5-6 month old metamorphosing leptocephali and become bentho-pelagic

(Correia et al., 2004; Wuenschel and Able, 2008; Able and Fahay, 2010). Congers remain in nursery habitat until winter, then migrate to the continental shelf adult feeding habitat (Able and Fahay, 2010). Adult Conger Eels are associated with structure such as holes and crevices in piers, wrecks, and rocky reefs or share Tilefish burrows (Able and Fahay, 2010). Congers have been observed in shallow coastal waters out to the shelf edge and may also make seasonal inshore-offshore migrations (Able and Fahay, 2010). Adults are piscivorous on gadids, Atlantic herring, American Eel, and Butterfish, but occasionally consume crustaceans (shrimps) and small molluscs (Bowman et al., 2000; Smith and Tighe, 2002). Spiny Dogfish are the main predator of Conger Eel, though other large piscivores like Cobia, Atlantic Cod, and Dusky Shark are also known to prey on Conger Eel (Smith and Tighe, 2002). There are minor commercial and recreational fisheries for Conger Eel, but they are not currently managed in the United States.

Literature Cited:

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