

Bloodworm – *Glycera dibranchiata*

Overall Vulnerability Rank = Very High ■

Biological Sensitivity = High ■

Climate Exposure = Very High ■

Data Quality = 71% of scores ≥ 2

<i>Glycera dibranchiata</i>		Expert Scores	Data Quality	Expert Scores Plots (Portion by Category)	
Sensitivity attributes	Stock Status	2.5	0.6		
	Other Stressors	2.4	1.8		
	Population Growth Rate	1.7	1.6		
	Spawning Cycle	3.0	2.8		
	Complexity in Reproduction	2.3	3.0		
	Early Life History Requirements	2.4	0.8		
	Sensitivity to Ocean Acidification	1.2	1.8		
	Prey Specialization	1.3	2.4		
	Habitat Specialization	1.6	2.6		
	Sensitivity to Temperature	1.2	2.4		
	Adult Mobility	3.2	3.0		
	Dispersal & Early Life History	3.4	2.4		
	Sensitivity Score		High		
	Exposure variables	Sea Surface Temperature	4.0	3.0	
Variability in Sea Surface Temperature		1.0	3.0		
Salinity		1.7	3.0		
Variability Salinity		1.2	3.0		
Air Temperature		3.6	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		2.0	1.0		
Sea Level Rise		2.7	1.5		
Exposure Score		Very High			
Overall Vulnerability Rank		Very High			

Bloodworm (*Glycera dibranchiata*)

Overall Climate Vulnerability Rank: **Very High** (95% certainty from bootstrap analysis).

Climate Exposure: **Very High**. Three exposure factors contributed to this score: Ocean Surface Temperature (3.9), Air Temperature (3.6), and Ocean Acidification (4.0). Adult Bloodworm live in intertidal mud habitats and early life stages inhabit in coastal waters.

Biological Sensitivity: **High**. Three sensitivity attributes scored above 3.0: Spawning Complexity (3.0), Adult Mobility (3.2), and Dispersal and Early Life History (3.4). Bloodworm are semelparous and spawning occurs in swarms. Adults have limited mobility and larvae are likely demersal and dispersal is limited.

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

Directional Effect in the Northeast U.S. Shelf: The effect of climate change on Bloodworm is estimated to be negative, but this estimate has a high degree of uncertainty (<66% certainty in expert scores). There is very little information regarding climate effects on Bloodworm. However, warming temperatures may begin restrict the distribution of Bloodworm in the region.

Data Quality: 71% of the data quality scores were 2 or greater indicate that data quality is moderate.

Climate Effects on Abundance and Distribution: There is very little known regarding the long-term population dynamics of Bloodworm. Environmental effects on recruitment, growth, survival and largely unstudied.

Life History Synopsis: Bloodworm is an estuarine and marine, semelparous, baitworm species found from the Gulf of St Lawrence to Florida and recorded in the Gulf of Mexico and eastern Pacific Ocean (Wilson and Ruff, 1988). Most Bloodworms mature, spawn, and die after 3 years, but some postpone until 4 or 5 years (Wilson and Ruff, 1988). Bloodworms undergo distinct physical changes to take on the sexual form or epitokes (Wilson and Ruff, 1988). Spawning occurs in swarms during afternoon high tides and only lasts a few days from May-June in Maine and southeastern Nova Scotia and in fall and possibly late spring in Maryland (Wilson and Ruff, 1988; DFO, 2009). Females rupture to release 10 million eggs, and while less dramatic, males also die after spawning (Wilson and Ruff, 1988). Eggs and early larvae occur on the sediment surface, but develop into the swimming stage after 14-20 hours postfertilization (Wilson and Ruff, 1988). The larval stage is either very short or demersal, because larvae are not found in plankton tows, and there is little evidence of larval exchange across mud flats (Wilson and Ruff, 1988; DFO, 2009). Larvae are planktotrophic (Wilson and Ruff, 1988). Adults occur mostly in the fine organic-rich mud of intertidal mud flats, but can be found in a variety of substrates and from the low water mark to 400 m (Wilson and Ruff, 1988; DFO, 2009). The species is quite adaptive to changes in salinity and oxygen content (Wilson and Ruff, 1988). During spring and summer, Bloodworms are generally found buried in the sediment, but in fall and winter occur in the water column (Wilson and Ruff, 1988). The most rapid growth occurs during the second and third years of their 5-year life (Wilson and Ruff, 1988). Bloodworms are probably predators on small invertebrates encountered while burrowing through the mud (such as amphipods and polychaetes), but may also consume detritus when needed (Wilson and Ruff, 1988; DFO, 2009). Black-bellied plovers are known predators of Bloodworms, and Striped Bass and sand shrimp consume the dead, spent Bloodworm bodies (Wilson and Ruff, 1988). Bloodworms are sold as live bait to marine sport fishermen (DFO, 2009). Commercial diggers need a license, but there is very

little regulation in United States waters (Sypitkowski et al., 2009). Bloodworms are harvested primarily in Maine where they seem to be sustainably harvested (Sypitkowski et al., 2009) and southeastern Nova Scotia where they are actively managed to maintain sustainable harvests (DFO, 2009).

Literature Cited:

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