

Northern Kingfish – *Menticirrhus saxatilis*

Overall Vulnerability Rank = Moderate ■

Biological Sensitivity = Low ■

Climate Exposure = Very High ■

Data Quality = 75% of scores  $\geq 2$

<i>Menticirrhus saxatilis</i>		Expert Scores	Data Quality	Expert Scores Plots (Portion by Category)
Sensitivity attributes	Stock Status	2.2	0.2	
	Other Stressors	2.1	1.6	
	Population Growth Rate	1.2	2.2	
	Spawning Cycle	2.1	3.0	
	Complexity in Reproduction	2.1	2.4	
	Early Life History Requirements	2.5	0.8	
	Sensitivity to Ocean Acidification	1.6	2.4	
	Prey Specialization	1.6	2.6	
	Habitat Specialization	1.4	3.0	
	Sensitivity to Temperature	1.2	2.6	
	Adult Mobility	1.4	2.8	
	Dispersal & Early Life History	2.4	1.0	
	<b>Sensitivity Score</b>	<b>Low</b>		
	Exposure variables	Sea Surface Temperature	4.0	3.0
Variability in Sea Surface Temperature		1.0	3.0	
Salinity		3.0	3.0	
Variability Salinity		1.2	3.0	
Air Temperature		4.0	3.0	
Variability Air Temperature		1.0	3.0	
Precipitation		1.2	3.0	
Variability in Precipitation		1.3	3.0	
Ocean Acidification		4.0	2.0	
Variability in Ocean Acidification		1.0	2.2	
Currents		2.0	1.0	
Sea Level Rise		1.3	1.5	
<b>Exposure Score</b>		<b>Very High</b>		
<b>Overall Vulnerability Rank</b>		<b>Moderate</b>		

## **Northern Kingfish (*Menticirrhus saxatilis*)**

Overall Climate Vulnerability Rank: **Moderate** (83% 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). Exposure to all three factors occur during all life stages. Northern Kingfish have an onshore-offshore seasonal migration and are exposed to ocean waters and nearshore waters.

Biological Sensitivity: **Low**. Only one sensitivity attribute scored above 2.5: Early Life History Requirements (2.5). Northern Kingfish spawn in coastal waters and juveniles settle in shallow water.

Distributional Vulnerability Rank: **High** (100% certainty from bootstrap analysis). Three of the attributes indicated vulnerability to distribution shift. Northern Kingfish are habitat generalists and found along sandy beaches. They are mobile as adults and larvae disperse over moderately large areas.

Directional Effect in the Northeast U.S. Shelf: The effect of climate change on Northern Kingfish on the Northeast U.S. Shelf is estimated to be positive, but this estimate has uncertainty (66-90% certainty in expert scores) owing to the relative lack of information regarding this species. This species is more common in the south and thus there is the expectation that as warming occurs more areas on the Northeast U.S. shelf will be thermally suitable. The effect of ocean acidification over the next 30 years is likely to be minimal.

Data Quality: 75% of the data quality scores were 2 or greater.

Climate Effects on Abundance and Distribution: Relatively few studies have examined the effect of climate factors on Northern Kingfish. Studies in other regions on congeners indicate that river discharge may be an important factor in the distribution and productivity of these species (Carassou et al., 2011). Increases in precipitation in the Northeast may negatively impact Northern Kingfish, but increases in temperature may allow range extension (Howell and Auster, 2012).

Life History Synopsis: Northern Kingfish is an estuarine and coastal finfish species that occurs from the Gulf of Maine to the Gulf of Mexico, but is most abundant between Cape Hatteras, North Carolina, and Cape Cod Massachusetts (Klein-MacPhee, 2002; Able and Fahay, 2010). Kingfish mature between 1-2 years of age and spawn in estuarine and coastal areas in spring through late summer (Klein-MacPhee, 2002; Able and Fahay, 2010). Eggs are pelagic and incubate for 46-50 hours (Klein-MacPhee, 2002). Larvae occur mostly in coastal areas and the surf zone, and some move into estuaries during summer months (Able and Fahay, 2010). Juveniles resemble adults and live on or near bottom in estuaries and coastal waters with sandy bottom where they consume crustaceans, polychaetes, and clupeid fishes (Klein-MacPhee, 2002; Able and Fahay, 2010). Juveniles leave estuaries in fall (Able and Fahay, 2010). Adult kingfish prefer hard or sandy bottom, form schools, and have no swim bladder to make the drumming sounds common to other members of the Sciaenidae family (Klein-MacPhee, 2002). Juvenile and adult kingfish make large seasonal migrations, moving south and maybe offshore in winter, occur off North Carolina in spring, and are abundant along the coast between North Carolina and Massachusetts in summer and fall (Able and Fahay, 2010). Northern Kingfish are bottom feeders that consume crustaceans, polychaetes, and fishes (Klein-MacPhee, 2002). Northern Kingfish are not managed in the northeastern US region, and there is no directed commercial fishery for the species.

Literature Cited:

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Howell P, Auster PJ. Phase shift in an estuarine finfish community associated with warming temperatures. Mar Coast Fish. 2012; 4(1): 481-495. doi: 10.1080/19425120.2012.685144

Klein-MacPhee G. Northern Kingfish/ *Menticirrhus saxatilis* (Bloch and Schneider 1801). In: Collete BB, Klein-MacPhee G, editors, Fishes of the Gulf of Maine, 3rd edition. Washington: Smithsonian Institution Press; 2002. pp. 442-444.