



## Northern shortfin squid

### *Species Climate Vulnerability:*

Northern shortfin squid (*Illex illecebrosus*) is projected to have low climate vulnerability. It is projected to experience high exposure to ocean surface temperature and ocean acidification during all life stages. It has low biological sensitivity. Northern shortfin squid is a habitat generalist that is highly mobile. Larvae have the potential to be broadly dispersed. The directional effect of climate change on northern shortfin squid in the Northeast U.S. Shelf is positive with a high degree of uncertainty. Warming may increase availability and a northward shift in the Gulf Stream may increase abundance of Northern shortfin squid in the Northeast U.S. shelf. Egg development is inhibited below 12.5 C so warming may increase spawning habitat off the Northeast U.S. Shelf. But productivity may decrease due to ocean acidification so the directional effect of climate change on this species is uncertain (Hare et al. 2016).

### *Habitat Dependence:*

Habitat used by shortfin squid includes marine shallow/inner shelf, shelf surface, shelf bottom, slope surface, and slope bottom water column habitats. Eggs and larvae are epi-pelagic, while juvenile and adults use both surface and bottom water column habitats, and adults have been reported at depths to >1000 m, depending on the time of year. Shortfin squid are also associated with sand-silt bottom habitats (Hendrickson and Holmes 2004).

### *Habitat Climate Vulnerability:*

Marine shelf surface water column habitat has low climate vulnerability. It is projected to have high exposure for sea surface temperature and acidification This habitat type has low sensitivities, with the only factor ranking high being sensitivity to changes in abiotic factors.

Marine slope surface water column habitat has low climate vulnerability. It is projected to have low climate exposure, and the only high exposure score high being ocean acidification This habitat type has low climate sensitivities, with moderate sensitivity to changes in abiotic factors.

The directional effect of climate change on marine water column habitats is projected to be mostly negative, although this is not consistent with the overall low climate vulnerability rank (Farr et al. 2021).

**Mid-Atlantic and New England**

There are no unique vulnerabilities between regions.

Habitat dependency by life stage (based on Hendrickson and Holmes 2004):

- *Eggs/Larvae:*
  - Marine water column, shallow/inner shelf.
  - Marine water column, shelf surface.
  - Marine water column, slope surface.
- *Juveniles/Young-of-the-Year, and Adults:*
  - Marine sand bottom <200 m.
  - Marine sand bottom >200 m.
  - Marine water column, shallow/inner shelf.
  - Marine water column, shelf bottom.
  - Marine water column, shelf surface.
  - Marine water column, slope bottom.
  - Marine water column, slope surface.
- *Spawning Adults:*
  - No data is currently available.

Northern Shortfin Squid					
		Life Stage Dependency			
Habitat Type	HCVA Climate Vulnerability Rank	Eggs/Larvae	Juveniles/ YOY	Adults	Spawning Adults
Marine Sand <200 m	Low		X	X	
Marine Sand >200 m	Low		X	X	
Marine Water Column, Shallow/Inner Shelf	Low	X	X	X	
Marine Water Column, Shelf Surface	Low	X	X	X	
Marine Water Column, Shelf Bottom	Low		X	X	
Marine Water Column, Slope Surface	Low	X	X	X	
Marine Water Column, Slope Bottom	Low		X	X	

X= Habitat dependency ranking is not available for this species.

## References

Farr ER, Johnson MR, Nelson MW, Hare JA, Morrison WE, Lettrich MD, et al. (2021). An assessment of marine, estuarine, and riverine habitat vulnerability to climate change in the Northeast U.S. PLoS ONE 16(12): e0260654. <http://doi.org/10.1371/journal.pone.0269654>

Hare JA, Morrison WE, Nelson MW, Stachura MM, Teeters EJ, Griffis RB, et al. (2016). A Vulnerability Assessment of Fish and Invertebrates to Climate Change on the Northeast U.S. Continental Shelf. PLoS ONE 11(2): e0146756. <https://doi.org/10.1371/journal.pone.0146756>

Hendrickson LC, Holmes EM (2004). Essential fish habitat source document. Northern shortfin squid, *Illex illecebrosus*, life history and habitat characteristics. NOAA Tech. Memo. NMFS-NE; 191. <https://repository.library.noaa.gov/view/noaa/4033>

Image credit: NOAA Fisheries