Essential Fish Habitat Description
Red hake (*Urophycis chuss*)

In its *Report to Congress: Status of the Fisheries of the United States* (September 1997), NMFS determined red hake is currently overfished. This determination is based on an assessment of stock size. Essential Fish Habitat for red hake is described as those areas of the coastal and offshore waters (out to the offshore U.S. boundary of the exclusive economic zone) that are designated on Figures 8.1 - 8.4 and in the accompanying table and meet the following conditions:

Eggs: Surface waters of the Gulf of Maine, Georges Bank, the continental shelf off southern New England, and the middle Atlantic south to Cape Hatteras as depicted in Figure 8.1. Generally, the following conditions exist where hake eggs are found: sea surface temperatures below 10° C along the inner continental shelf with a salinity less than 25‰. Hake eggs are most often observed during the months from May - November, with peaks in June and July.

Larvae: Surface waters of Gulf of Maine, Georges Bank, the continental shelf off southern New England, and the middle Atlantic south to Cape Hatteras as depicted in Figure 8.2. Generally, the following conditions exist where red hake larvae are found: sea surface temperatures below 19° C, water depths less than 200 meters, and a salinity greater than 0.5‰. Red hake larvae are most often observed from May through December, with peaks in September - October.

Juveniles: Bottom habitats with a substrate of shell fragments, including areas with an abundance of live scallops, in the Gulf of Maine, on Georges Bank, the continental shelf off southern New England, and the middle Atlantic south to Cape Hatteras as depicted in Figure 8.3. Generally, the following conditions exist where red hake juveniles are found: water temperatures below 16° C, depths less than 100 meters and a salinity range from 31 - 33‰.

Adults: Bottom habitats in depressions with a substrate of sand and mud in the Gulf of Maine, on Georges Bank, the continental shelf off southern New England, and the middle Atlantic south to Cape Hatteras as depicted in Figure 8.4. Generally, the following conditions exist where red hake adults are found: water temperatures below 12° C, depths from 10 - 130 meters, and a salinity range from 33 - 34‰ .

Spawning Adults: Bottom habitats in depressions with a substrate of sand and mud in the Gulf of Maine, the southern edge of Georges Bank, the continental shelf off southern New England, and the middle Atlantic south to Cape Hatteras as depicted in Figure 8.4. Generally, the following conditions exist where spawning red hake adults are found: water temperatures below 10° C, water depths less than 100 meters and salinity less than 25‰. Red hake are most often observed spawning during the months from May - November, with peaks in June and July.

All of the above EFH descriptions include those bays and estuaries listed on the following table, according to life history stage. The Council acknowledges potential seasonal and spatial variability of the conditions generally associated with this species.

EFH Designation of Estuaries and Embayments
Red hake (*Urophycis chuss*)

Estuaries and Embayments	Eggs	Larvae	Juveniles	Adults	Spawning Adults
Passamaquoddy Bay			m,s	m,s	
Englishman/Machias Bay			s	s	
Narraguagus Bay			s	s	
Blue Hill Bay			s	s	
Penobscot Bay			m,s	m,s	
Muscongus Bay			m,s	m,s	
Damariscotta River			m,s	s	
Sheepscot River		s	m,s	m,s	s
Kennebec / Androscoggin Rivers			m,s	m,s	
Casco Bay			s	s	
Saco Bay			s	s	
Wells Harbor					
Great Bay			s	s	
Merrimack River					
Massachusetts Bay		s	s	s	s
Boston Harbor		s	s	s	
Cape Cod Bay		s	m,s	m,s	s
Waquoit Bay					
Buzzards Bay		s	m,s	m,s	s
Narragansett Bay		s	s	s	s
Long Island Sound			m,s	m,s	
Connecticut River			m	m	
Gardiners Bay					
Great South Bay					
Hudson River / Raritan Bay		m,s	m,s	m,s	
Barnegat Bay					
Delaware Bay				s	
Chincoteague Bay					
Chesapeake Bay			s	s	

S ≡ The EFH designation for this species includes the seawater salinity zone of this bay or estuary (salinity > 25.0‰).

M ≡ The EFH designation for this species includes the mixing water / brackish salinity zone of this bay or estuary (0.5 < salinity < 25.0‰).

F ≡ The EFH designation for this species includes the tidal freshwater salinity zone of this bay or estuary (0.0 < salinity < 0.5‰).

These EFH designations of estuaries and embayments are based on the NOAA Estuarine Living Marine Resources (ELMR) program (Jury *et al.* 1994; Stone *et al.* 1994). For a detailed view of the salinity zone boundaries, as described in the ELMR reports, please see Appendix B. The Council recognizes the spatial and temporal variability of estuarine and embayment environmental conditions generally associated with this species.

Essential Fish Habitat
Red hake (*Urophycis chuss*) Eggs

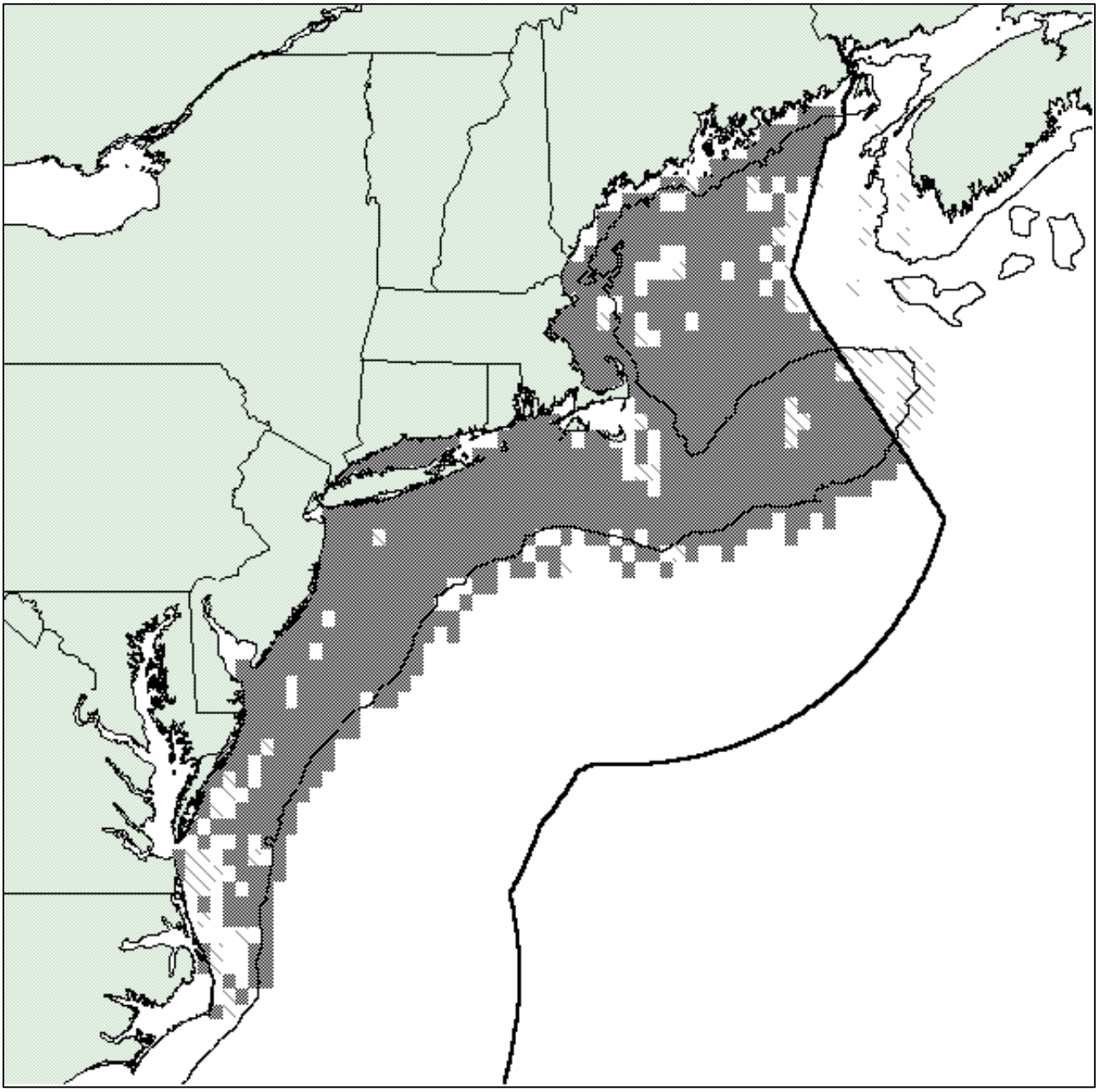

Figure 8.1: The EFH designation for red hake eggs is based upon alternative 3 for red hake juveniles in combination with alternative 3 for hake (*Urophycis* spp.) eggs. The observed distribution of hake eggs was not unique to red hake and did not reflect the portion of the population in the Gulf of Maine, so the combination of juveniles and eggs was used as a proxy to identify those areas important to red hake eggs. These alternatives were selected to cover the areas most important to red hake development. This designation also includes those bays and estuaries identified by the NOAA ELMR program as supporting red hake eggs at a "common" or "abundant" level. The light shading represents the entire observed range of hake eggs.

Essential Fish Habitat
Red hake (*Urophycis chuss*) Larvae

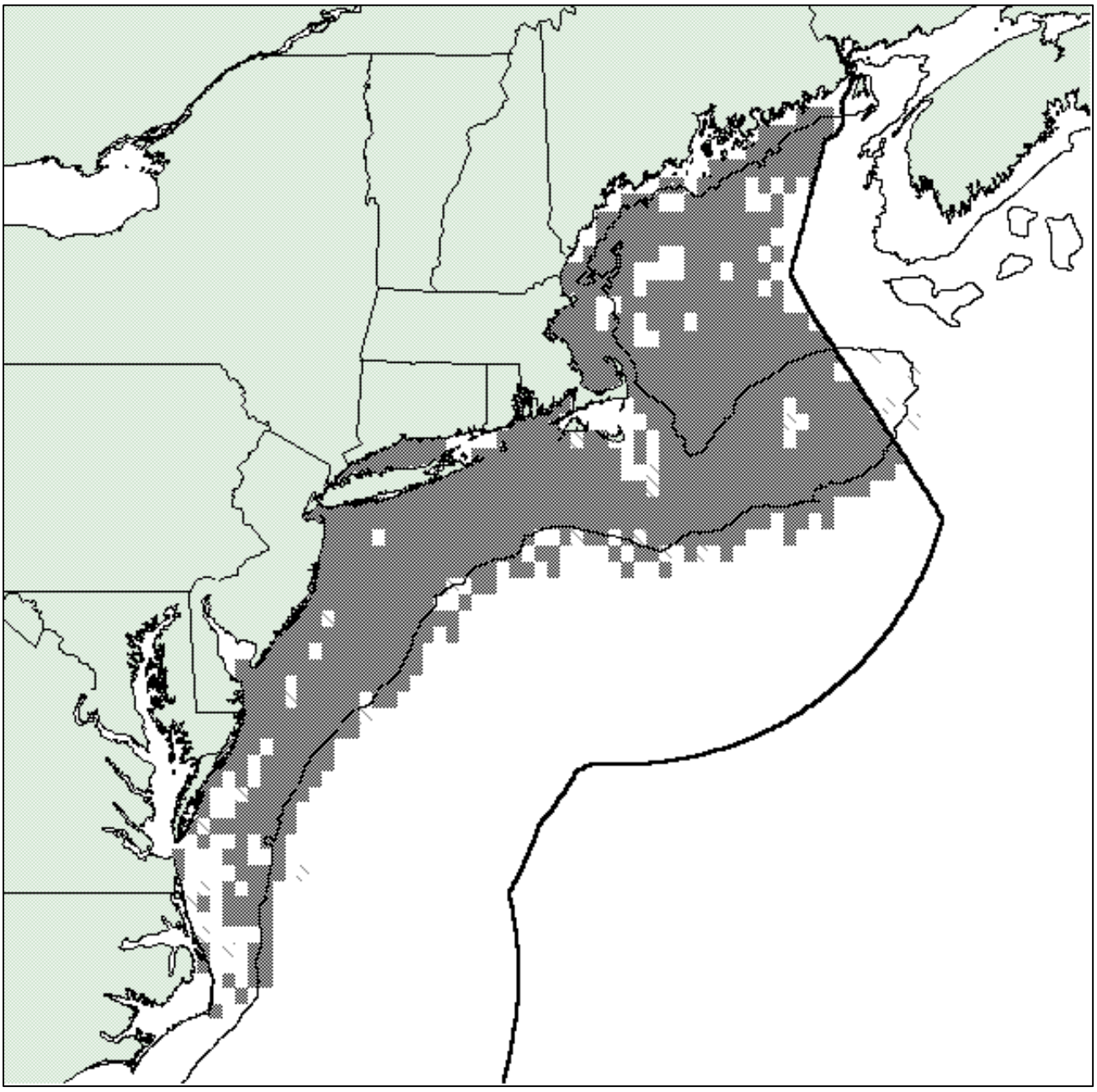

Figure 8.2: The EFH designation for red hake larvae is based upon alternative 3 for red hake juveniles in combination with alternative 3 for hake (*Urophycis* spp.) eggs. The observed distribution of red hake larvae was patchy and sparse, so the combination of juveniles and eggs was used as a proxy to identify those areas important to red hake larvae. These alternatives were selected to cover the areas most important to red hake development. This designation also includes those bays and estuaries identified by the NOAA ELMR program as supporting red hake larvae at a "common" or "abundant" level. The light shading represents the entire observed range of hake larvae.

Essential Fish Habitat
Red hake (*Urophycis chuss*) Juveniles

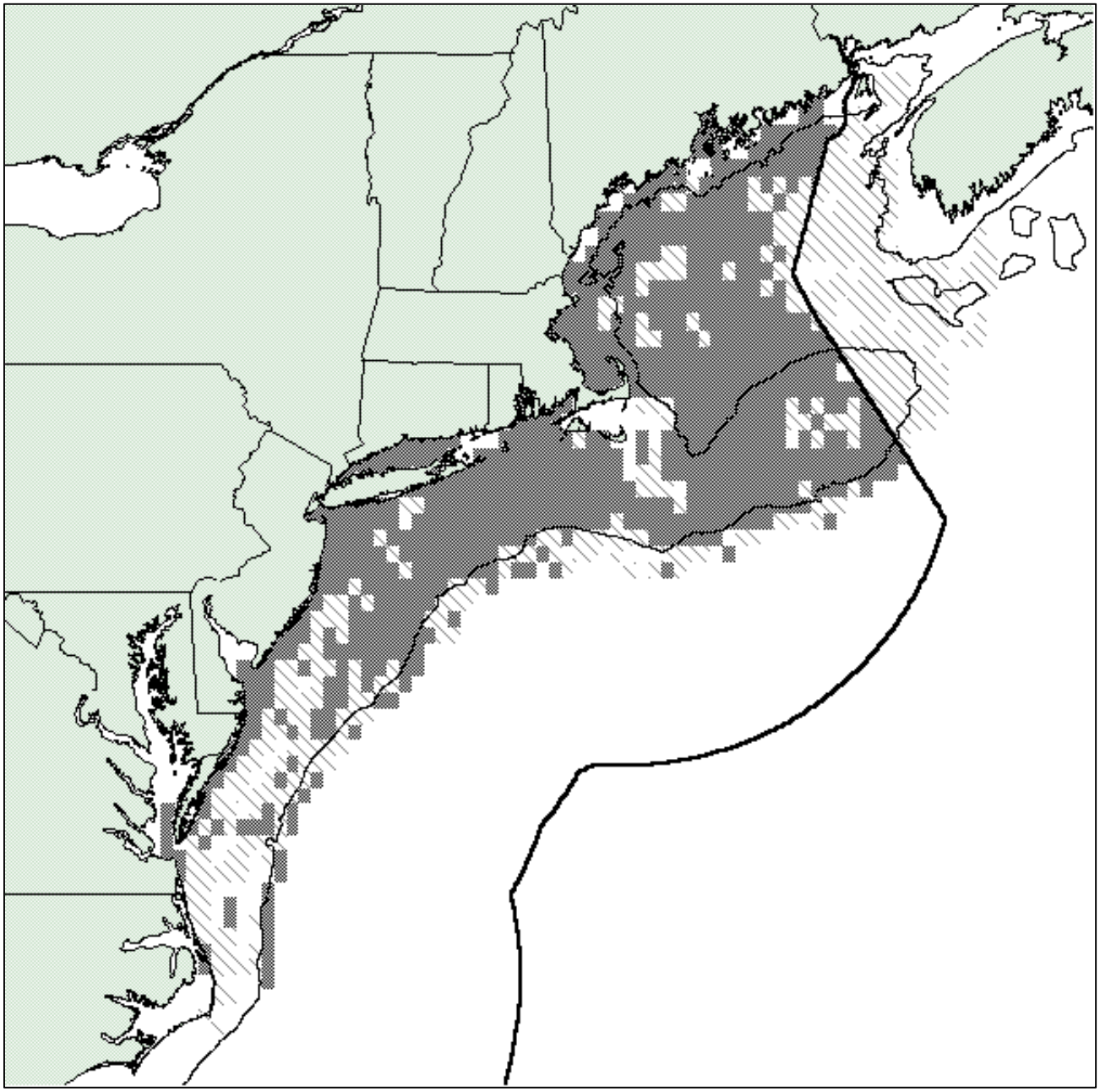

Figure 8.3: The EFH designation for juvenile red hake is based upon alternative 3 for juvenile red hake. This designation also includes those bays and estuaries identified by the NOAA ELMR program as supporting juvenile red hake at a "common" or "abundant" level. This alternative was selected to be inclusive of most areas where red hake occur in relatively high concentrations. The light shading represents the entire observed range of juvenile red hake.

Essential Fish Habitat
Red hake (*Urophycis chuss*) Adults

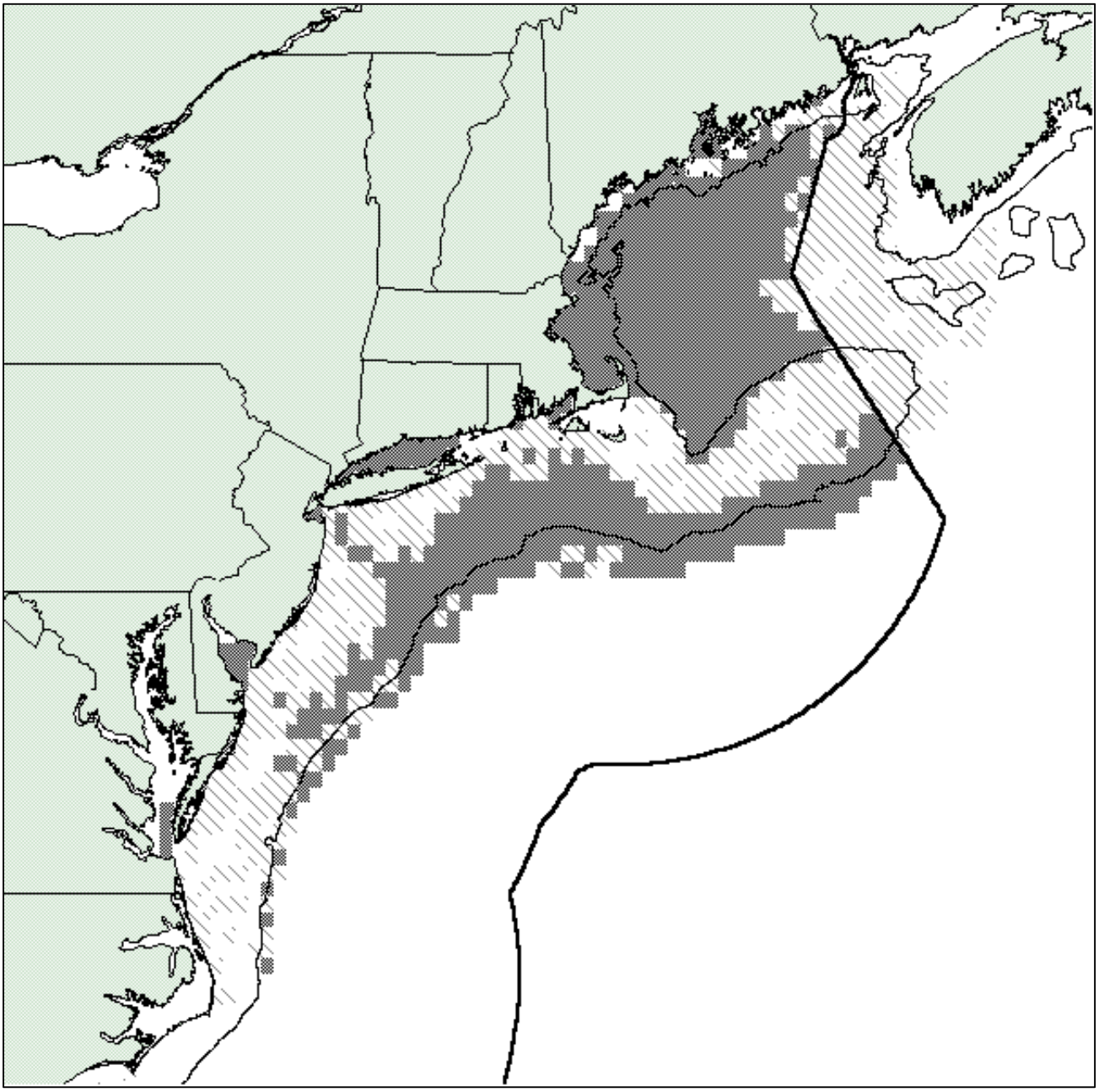

Figure 8.4: The EFH designation for adult red hake is based upon alternative 3 for adult red hake. This designation also includes those bays and estuaries identified by the NOAA ELMR program as supporting adult red hake at a "common" or "abundant" level. This alternative was selected to be inclusive of most areas where red hake occur in relatively high concentrations. The light shading represents the entire observed range of adult red hake.