

# Seals as Sentinels Research

## Harbor Seal Prey Fish Consumption: Seasonal Patterns and Trends

Harbor seals are opportunistic feeders on an array of teleost (bony) fishes in nearshore waters of the northern hemisphere. Because harbor seals feed at the top of the food chain in coastal and estuarine environments, they are exposed to contaminated habitats and prey across their range. This study examined patterns of prey fish consumption in harbor seals along the mid-Maine coast to elucidate major components of their seasonal diet. The study also looked at spatial and temporal variability in harbor seal prey selection.



During summer 2000, scat samples were collected from harbor seals at haul-out sites in mid-coast Maine including Blue Hill Bay, Frenchman's Bay, and Penobscot Bay. The samples were analyzed for the presence of fish otoliths (earbones) using standard methods at the NOAA Northeast Fisheries Science Center, Woods Hole, MA..

### Findings

Four fish species were predominant harbor seal prey comprising 75% of the diet -- silver hake (whiting), red/white hake, Atlantic herring, and redfish. Minor components of the diet included Atlantic cod, butterfish, winter flounder, sculpin, and sea raven.

A large component (9-21%) of the harbor seal diet comprised unidentified fish species. These species likely include seasonally abundant schooling and demersal fishes in the Gulf of Maine such as alewife, mackerel, and plaice (dab), among others.

The harbor seal diet varied by site. At Indian Point (Frenchman's Bay), redfish made up 80% of the diet, whereas at Mt. Desert Rock, an offshore site, silver hake was predominant (46%), followed by Atlantic herring and red/white hake. Seals in Penobscot Bay consumed primarily hake (56%) and redfish (18%).

The diet also varied from month to month. In July, silver hake and Atlantic herring made up 80% of the total diet. In August, silver and red/white hake were predominant prey (79% of the total), followed by Atlantic cod (13%), while Atlantic herring made up only 6% of the diet.

The results of this study confirm that harbor seals in the Gulf of Maine feed opportunistically on a variety of seasonally available teleost fishes. There are large differences in diet among seals inhabiting discrete haul-out sites, and there are equally large differences in the harbor seal diet over time. These dietary shifts reflect the changing habitats and highly migratory nature of the fishes they consume. Most of these fish migrate from Newfoundland to North Carolina.



The major prey of harbor seals represent commercially important fish stocks in the northwest Atlantic marine ecosystem, and thus are the same fish consumed by people.

**Publications resulting from this study:**

Wood, S.A. (2001). [Report to MERI: Summary of Harbor Seal \(\*Phoca vitulina concolor\*\) Food Habits in Mid-Coast Maine: Summer 2000](#), Marine Environ. Research Institute, Blue Hill, ME, 12 pp.

\*Wood S, Ferland A, Waring G, Sette L, Shaw SD. (2001). Harbor seal (*Phoca vitulina*) food habits along the New England coast. Abstract, 14th Biennial Conference of the Society of Marine Mammals in Vancouver, British Columbia, Canada, 28 November - 3 December 2001.