

Pinniped/salmonid interactions inferred by genetic analysis of salmon remains in harbor seal scat

Problem Statement

The predator/prey relationship between salmon and harbor seals is not well understood, but may have a substantial impact on the recovery of some listed salmon populations.



Critical Factors

- Marine mammals such as harbor seals may be a major source of predation on some salmonid species, including some protected species.
- Genetic data (i.e., DNA) obtained from salmon bones in harbor seal scat can be used to identify prey items eaten.
- Genetic data may also reveal to which Evolutionarily Significant Unit (ESU) the salmon prey items belonged.
- Estimates of predation levels on particular salmonid populations by marine mammals may provide insight into species interactions that could impact the recovery of listed populations.

Status of Research

Scientists at the Northwest Fisheries Science Center (NWFSC) have developed a technique for extracting DNA from salmon bones found in harbor seal scat. This information enables researchers to identify the species of salmon eaten by harbor seals. National Marine Mammal Laboratory (NMML) scientists collect scat samples in the field, sort through the remains, and identify salmonid bones based on gross morphology. These identified bone samples are then transferred to the NWFSC where DNA analyses are carried out to confirm species identifications. Processing of bone samples is ongoing and baseline genetic data will be expanded to enable identification of samples to the level of ESUs.

Future Considerations

The results of this research will be used to study harbor seal feeding habits and to estimate the impact of harbor seal predation on recovering salmon populations. Development of this technique, the ability to identify specific salmon stocks, and the expansion of the genetic database that is used for stock identification will tie into the efforts of other research projects that seek to differentiate salmon stocks from mixed sources (e.g. forensics, mixed-stock fishery analysis, etc.).

Key Players

Conservation Biology (CB) Division, NWFSC
National Marine Mammal Laboratory, NMFS

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