LIVING MARINE RESOURCES PROJECT 73

Marbled Murrelet Diet and Forage Species Availability in Puget Sound

NEED

The Navy supports research on endangered marine species found in and near Navy operating areas to meet regulatory requirements. The marbled murrelet populations in Puget Sound waters are declining due, in part, to marine factors affecting prey quality and quantity.

Marbled murrelet.

SOLUTION

This project will provide data on a) what marbled murrelets in Puget Sound area of Washington are eating and b) what prey are present during both the breeding and non-breeding seasons. The project, funded by the Department of Defense (DoD) Legacy Resource Management Program and the Living Marine Resources (LMR) program, will help managers prioritize for prey species key to the marbled murrelet.

METHODOLOGY

Marbled murrelet diet composition will be reconstructed using fecal DNA from birds captured at night in areas of relatively high abundance during both the breeding and non-breeding seasons. Availability and abundance of forage species will be determined using several techniques in combination (eDNA, trawl surveys, acoustic surveys) with the goal of comparing what murrelets are eating with what is available in nearby waters using frequency of occurrence of various prey species. Finally, integrating eDNA with trawl and acoustic monitoring will provide insights into the effectiveness of eDNA alone in assessing the abundance and availability of forage fish and other schooling prey items such as shrimp, krill and squid.

The project will focus on two sampling periods, with murrelet non-breeding season sampling in winter (January/February) and breeding season sampling in spring/summer (May/June). At-sea survey efforts, Navy-funded fall/winter surveys and U.S. Fish and Wildlife (FWS)-funded spring/summer surveys will be used to identify areas of high murrelet density. This density information will focus murrelet capture efforts and will be used to establish transects for eDNA, acoustic and trawl sampling.

The various prey items that are identified in the marine environment by eDNA, acoustics and trawls will be compared to murrelet diet to determine if the results of prey sampling methods capture all dietary items identified in marbled murrelet feces. Comparisons will also allow for a qualitative

NAVFAC Naval Facilities Engineering Systems Command
EXWC Engineering and Expeditionary Warfare Center

determination of prey species composition and help determine if murrelets are feeding on the most abundant and locally available prey in the appropriate size classes. Results from the acoustic and trawl surveys also will be compared to eDNA results to evaluate the potential of eDNA as a method for assessing the distribution and abundance of critical prey resources for a variety of predator species including listed fish species.

SCHEDULE

The project was initiated in 2023 under the DoD Legacy Resource Management Program. LMR will support an additional year of data collection, to be completed during 2025. Data analyses and reports will be completed in 2026.

NAVY BENEFITS

Improving the status of marbled murrelet populations in Washington can ease regulatory challenges in Navy operating areas of Washington. Results of the project will help the Navy and U.S. FWS strategically work to increase the effectiveness of Navy investments.

DELIVERABLES

Project results and methods will be shared through a publication, a presentation and status reports. These results will be helpful to the Navy at-sea compliance community and the general scientific community.

Marbled murrelet.
Roy W. Lowe, USFWS

ABOUT THE PRINCIPAL INVESTIGATORS

Dr. Scott Pearson is a senior researcher in the Science Division, Washington Department of Fish and Wildlife. His current work is focused on assessing population trends and identifying mechanisms responsible for the decline of species of concern. He has been studying marbled murrelet populations and bird diet for over 20 years.

Monique Lance is a Fish and Wildlife Research Biologist in the Science Division, Washington Department of Fish and Wildlife. Her work focuses on the distribution and abundance of seabirds, and marbled murrelets specifically. She has also specialized in the diet of seabirds and marine mammals in Washington for the past 25 years.

About the LMR Program

The LMR program's fundamental mission is to support the Navy's ability to conduct uninterrupted training and testing, which preserves core Navy readiness capabilities. LMR is an applied research program that funds Navy-driven research needs to support at-sea compliance and permitting. For more information, contact the LMR program manager at exwc_lmr_program@us.navy.mil or visit exwc.navfac.navy.mil/lmr.