

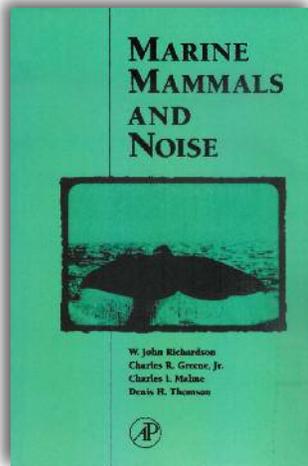


LIVING MARINE RESOURCES PROJECT 10

The Effects of Noise on Marine Mammals

THE NEED

Currently, the single most cited resource for information on the effects of noise on marine mammals is a book that was published in 1995 (*Marine Mammals and Noise*, Academic Press, San Diego). This book has been a valuable resource for the Navy, environmental planners, regulators and scientists. It provides the scientific community with a single resource for the research available on this topic up to the early 1990's. In the last 20 years, the literature related to this issue has expanded greatly and there is more information to consider when assessing the effects of noise on marine mammals. There is a pressing need to update this book that is shared by multiple stakeholders who use this resource.



Marine Mammals and Noise, published in 1995, is the single most cited source for marine mammal data. This LMR project will develop an updated source for information on marine mammal bioacoustics.

THE SOLUTION

Since there are many stakeholders involved and the effort is so large, this is a leveraged project with funding from the Office of Naval Research, National Marine Fisheries Service, and Joint Industry Program—all supporting key tasks that need to be completed before the *Marine Mammals and Noise* book can be updated. The LMR program funded the following specific tasks:

1. Develop a publicly accessible database of literature on marine mammal bioacoustics.

2. Review the literature and publicly available data on the sounds produced by marine mammals and on marine mammal hearing.
3. Prepare a subsequent essay on how marine mammal bioacoustic data can inform both conservation efforts and the management of marine resources based on the literature review conducted.

This project better enables Navy environmental planners and scientists by consolidating two decades of marine mammal studies relevant to the Navy at-sea environmental compliance process.

THE METHODOLOGY

The first goal of the LMR-funded portion of this project is to develop a publicly accessible database of literature on marine mammal bioacoustics. All four members of the project team have their own research database from which to gather information. The team will also actively solicit articles and reports from the scientific community, including “grey” literature (reports that were not published in scientific journals).

The information gathered in this project will be summarized into two final reports—one on marine mammal sound generation and a second on marine mammal hearing. An essay will also be published summarizing the findings.

THE SCHEDULE

As each team member has his or her own collection of research literature, work will immediately begin to compile this existing bioacoustics literature into a single database, while at the same time launching the additional literature review. When this task is complete, the team will begin writing the final reports. Finally, an essay will be produced on how marine mammal

bioacoustic research and data can inform conservation and management. Once this project is complete at the end of fiscal year 2016, the team will leverage this work and solicit sufficient additional funds to produce a book compiling the team's findings.



Humpback whales.

NAVY BENEFITS

All stakeholders concerned about the impact of anthropogenic noise on marine mammals would benefit from the first single source in 20 years to bring together available research on marine mammal sound production and hearing. It is expected that an updated, authoritative information source would also help alleviate overly conservative values sometimes used by regulators. The project's final essay will provide Navy-specific recommendations.

TRANSITION

This project will provide updated data and information regarding hearing and sound production of marine mammals that will be used in the Navy's at-sea environmental compliance process to guide the analysis of acoustic impacts from Navy training and testing activities. This information is not only important to the

Navy, but is important to the entire marine mammal research community and will be advertised at key conferences and announced on related websites.

ABOUT THE PRINCIPAL INVESTIGATORS

Principal Investigator: Christine Erbe has worked on underwater noise impacts on marine mammals for Fisheries & Oceans Canada, worked as a private bioacoustic consultant, and was Director of JASCO Applied Sciences Australia, a consultancy in underwater noise. Three years ago, she became Director of the Center for Marine Science & Technology at Curtin University in Perth, Western Australia. She holds degrees in physics and education, and a Ph.D. in geophysics from the University of British Columbia, Canada.



Co-Principal Investigator: Dorian Houser is the Director of Conservation and Biological Research at the National Marine Mammal Foundation. Dorian holds a Ph.D. in biology and is active in research involving marine mammal physiology and bioacoustics. Dorian has spent nearly two decades in the study of how anthropogenic sound affects marine mammals and has been involved in the development of numerous environmental impact statements for the U.S. government.



About the LMR Program

The Living Marine Resources (LMR) program seeks to develop, demonstrate, and assess data and technology solutions to protect living marine resources by minimizing the environmental risks of Navy at-sea training and testing activities while preserving core Navy readiness capabilities. For more information, contact the LMR program manager at exwc_lmr_program@navy.mil or visit www.lmr.navy.mil.

