BOEM
Bureau of Ocean Energy Management

Office of Renewable Energy Programs

Workshop on Best Management Practices for Atlantic Offshore Wind Facilities

& Marine Protected Species

March 7-9, 2017

NOAA
National Oceanic and Atmospheric Administration
U.S. Department of Commerce

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Workshop Overview

NOAA
National Oceanic and Atmospheric Administration
U.S. Department of Commerce

Best Management Practices

"Best management practices mean practices recognized within their respective industry, or by Government, as one of the best for achieving the desired output while reducing undesirable outcomes."
– §30 CFR 585.112

BMPs for protected species can include:

- Effective and practicable to prevent or reduce impacts
- Monitoring impacts
- Implemented in a standardized way
- Technological, economic, safety, and regulatory considerations
- Address concerns and achieve offshore wind goals

Panel Selection

- A Cross section of stakeholder groups
  - Industry
  - Regulators
  - Scientific
  - Environmental NGOs
  - International partners
- Expertise in their discipline(s)
- Actively engaged with the workshop topics and issues
- Nice and agreed to come to the workshop!

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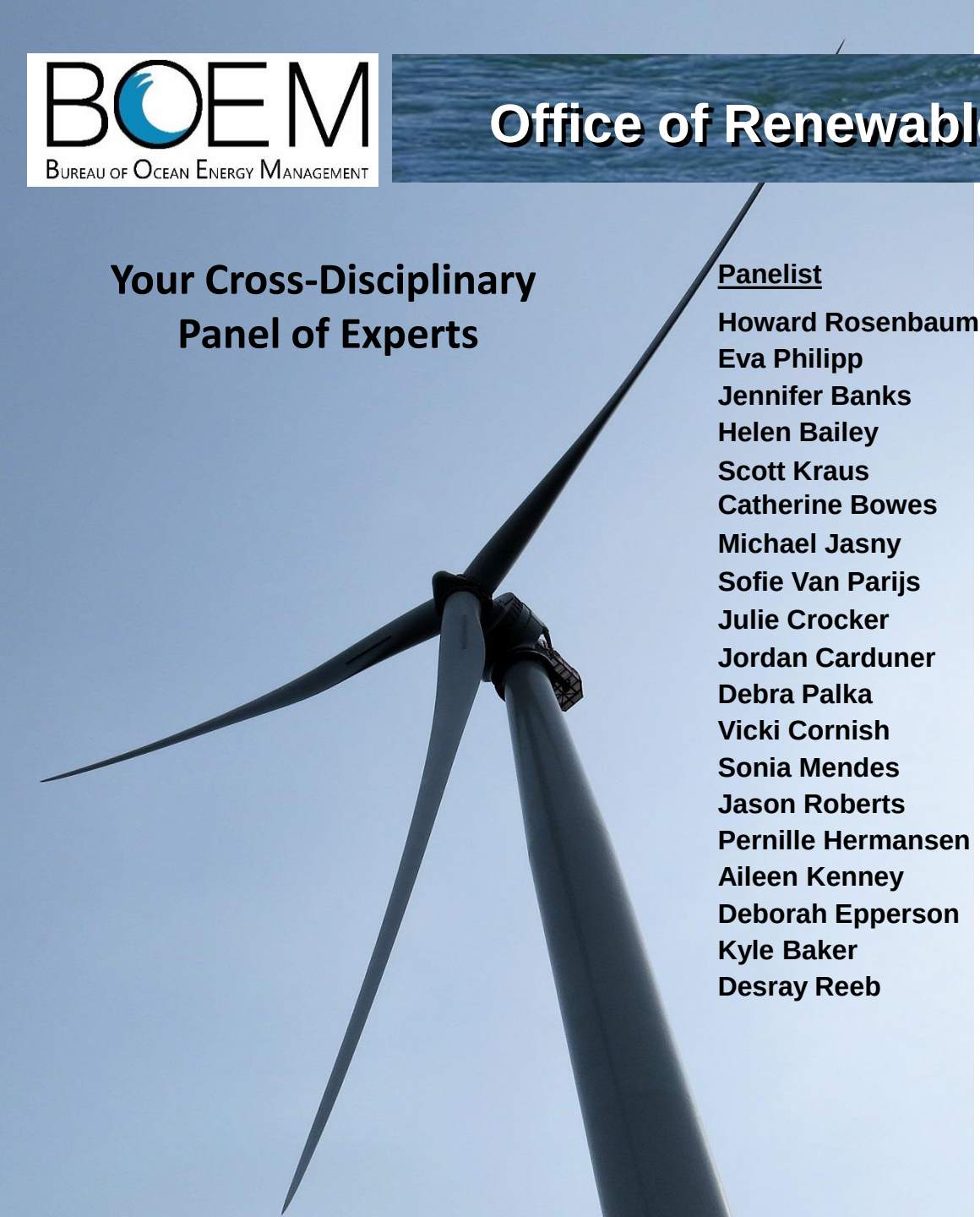

Your Cross-Disciplinary Panel of Experts

Panelist	Affiliation
Howard Rosenbaum	Wildlife Conservation Society
Eva Philipp	Vattenfall
Jennifer Banks	US Wind
Helen Bailey	University of Maryland CES
Scott Kraus	New England Aquarium
Catherine Bowes	National Wildlife Federation
Michael Jasny	National Resources Defense Council
Sofie Van Parijs	NOAA Fisheries
Julie Crocker	NOAA Fisheries
Jordan Carduner	NOAA Fisheries
Debra Palka	NOAA Fisheries
Vicki Cornish	Marine Mammal Commission
Sonia Mendes	Joint Nature Conservation Committee, UK
Jason Roberts	Duke University
Pernille Hermansen	Dong Energy
Aileen Kenney	Deepwater Wind
Deborah Epperson	Bureau of Safety and Environmental Enforcement
Kyle Baker	Bureau of Ocean Energy Management
Desray Reeb	Bureau of Ocean Energy Management

U.S. Department of the Interior
March 3, 1849

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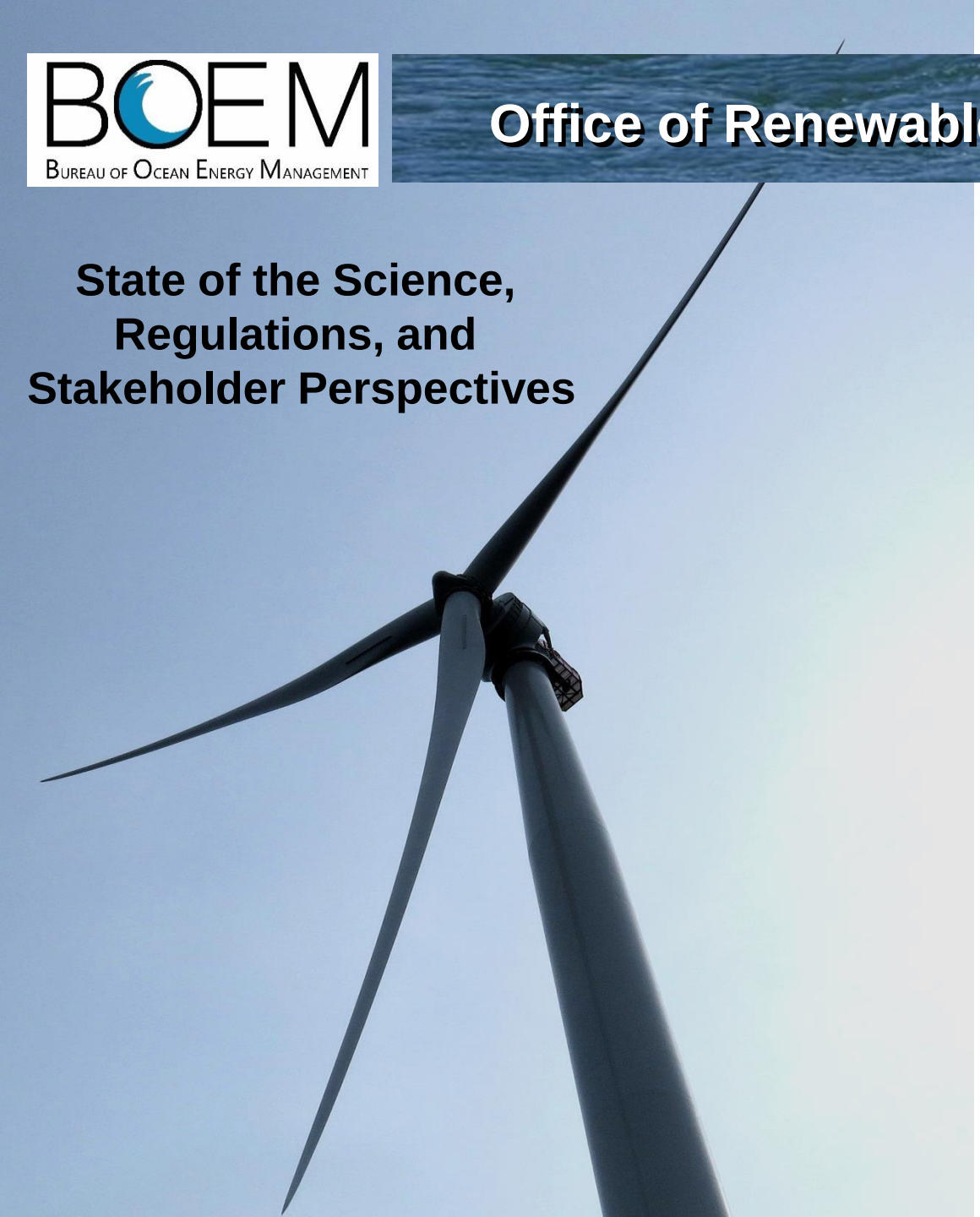

State of the Science, Regulations, and Stakeholder Perspectives

Invited Speakers

APEM
AWEA
Bureau of Ocean Energy Management
Deepwater Wind
Duke University
Jasco Applied Sciences
Joint Nature Conservation Committee, UK
NRDC, NWF, and WCS
The Nature Conservancy
The New England Aquarium
NOAA Fisheries
USCG District V
Vattenfall

Roles and Objectives of the Workshop Panel

- Provide opinions and advice for BMPs
  - Mitigation measures
  - Standardized monitoring procedures
  - How to maintain and share information
- Listen, ask questions, and understand the science, regulations, and perspectives.
- We are not seeking consensus on issues.
- Lively discussion and debate are encouraged.

Workshop Objectives

- Increase understanding around the science and regulations for protecting marine species from the effects of offshore wind development on the Atlantic Outer Continental Shelf (OCS).

- Identify and discuss possible best management practices (BMPs) for preventing, reducing, and monitoring offshore wind effects to marine protected species on the Atlantic OCS.

Workshop Outcomes

A workshop report will include:

- **Anticipated impacts to protected species**
- **BMPs identified**
- **Approaches for standardized monitoring**
- **How to manage and share data**
- **Challenges and constraints**
- **Other recommendations moving forward**

Outcomes May Inform:

- BOEM's Environmental Assessments under NEPA
- Future guidance
- Environmental Studies for areas of needed research
- ESA consultations and MMPA applications
- Expectations moving forward

Agenda

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Agenda

DAY 1: Stakeholder Perspectives
Identify Effects of Protected Species and UK Experience
Underwater Sound and NOAA Guidance
High Resolution Geophysical surveys

Day 2: Pile Driving and German experience
Environmental Baseline

Days 3: Baseline (continued)
Vessel operations
Wrap up BMP outcomes

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Agenda

- Presentations
- Panel Discussions
- Participant questions and comments
  - Oral Comments
  - Comment cards

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Proposed Workshop Ground Rules

Please –

- Turn phones and other electronics on silent.
- Try to arrive on time after breaks and lunch.
- Keep side conversations to a minimum.
- Explain acronyms; and try to avoid using.
- Focus discussions to the current topic and workshop objectives.
- Use the parking lot for off-track topics. They will be returned to as time permits.
- Agree to table discussions that require more time than allowed unless the other Panelists agree to spend more time on them.
- Raise your tent card if you have a question or have a comment to add.
- Ask for clarification when you need it.

Let's learn a lot from one another and try to have a good time!

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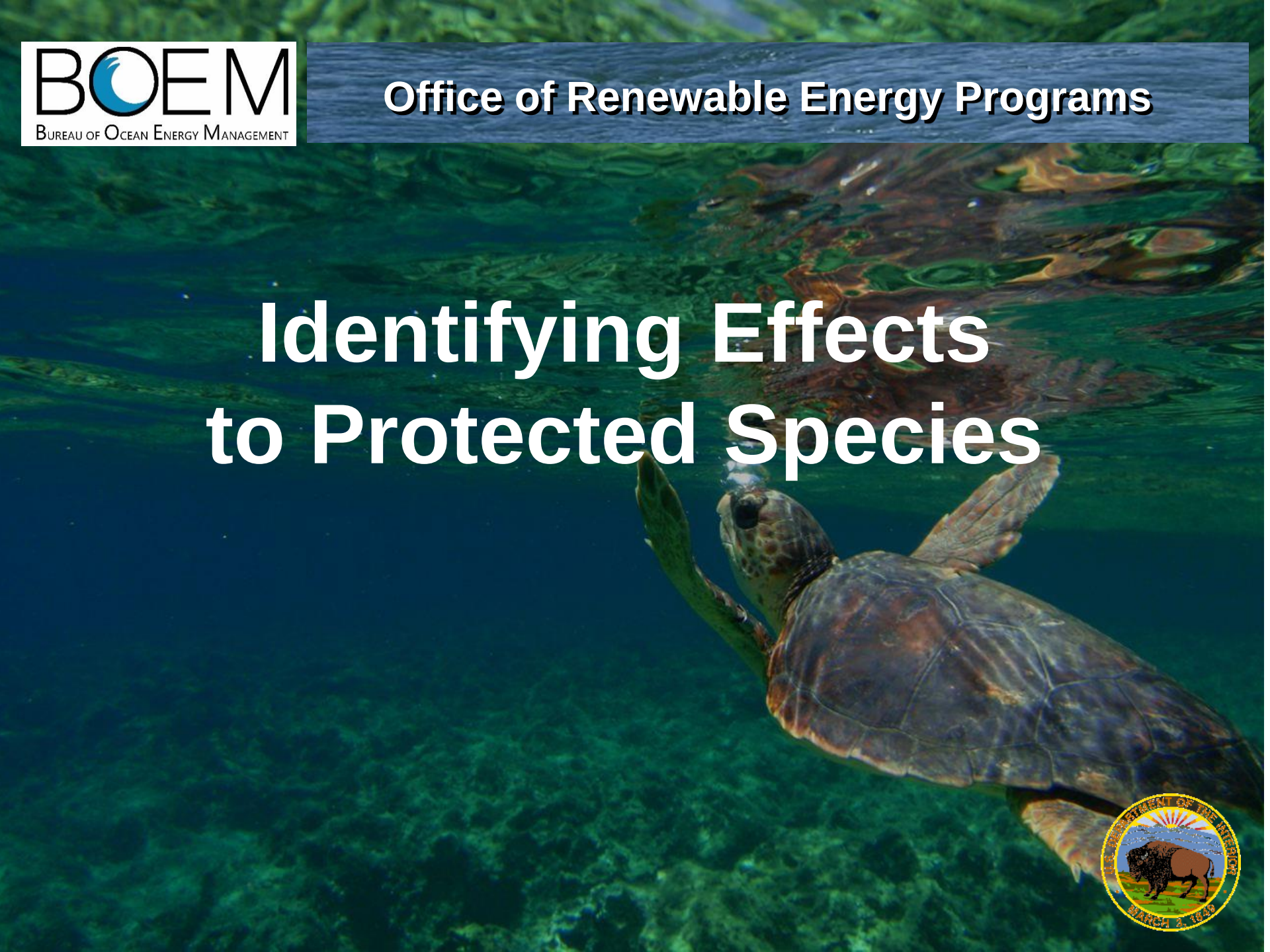
Identifying Effects to Protected Species



Identifying Effects

- Predicted effects are based on NEPA, ESA, and MMPA assessments
  - Species found there
  - Types of project activities
  - Geographic location
  - Habitat
  - Time of year
  - Duration
- Group-specific effects (e.g., large whales, small cetaceans, seals, and turtles) based on hearing, behavior, and similarities
- Species-specific effects based on habitat and other conservation needs

Predicted Effects Inform BMPs

- Mitigating predicted effects
  - Measures to reduce or avoid predicted effects
- Monitoring predicted effects
  - Verify accuracy predictions
  - Study effectiveness of mitigation
  - Detect unabticipated impacts
- Reporting and data management needs
- Feedback to future predictions and improved BMPs

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Identifying Effects

OBJECTIVES

- Understand the conservation and recovery needs of protected species
- Common impacts and mitigation practices
- Understand anticipated lease development activities in the U.S.
- Identify what can be learned from experiences in the UK
- After Lunch: A panel discussion on the effects to protected species and priorities of anticipated impacts

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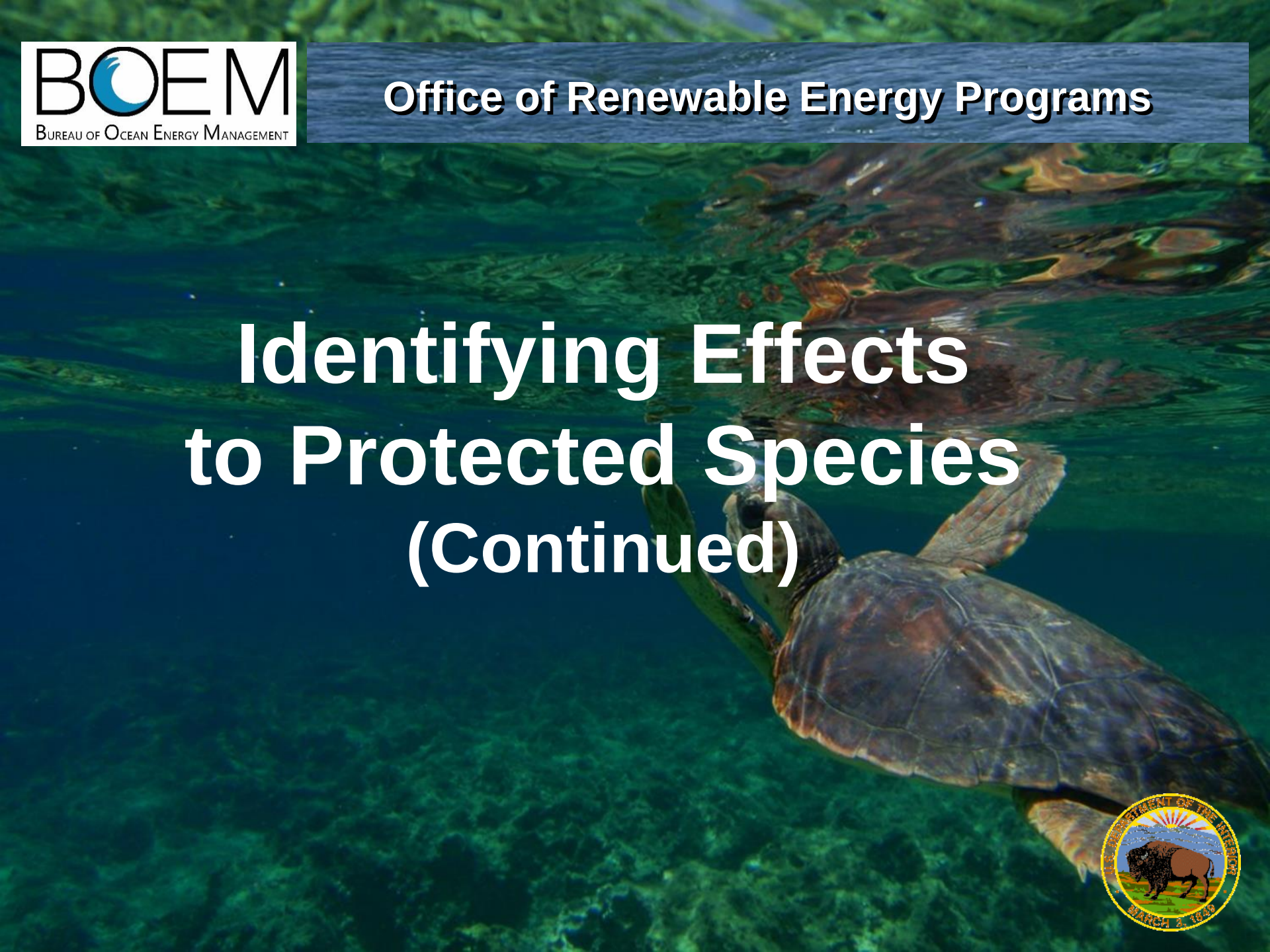
Identifying Effects to Protected Species (Continued)

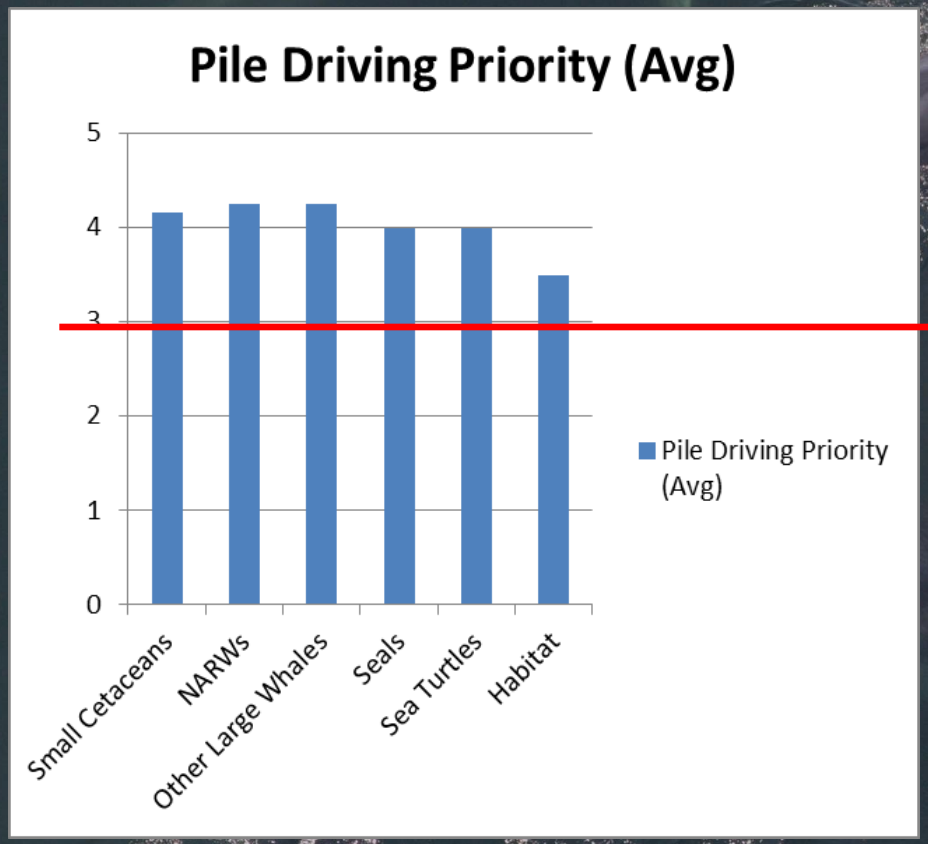


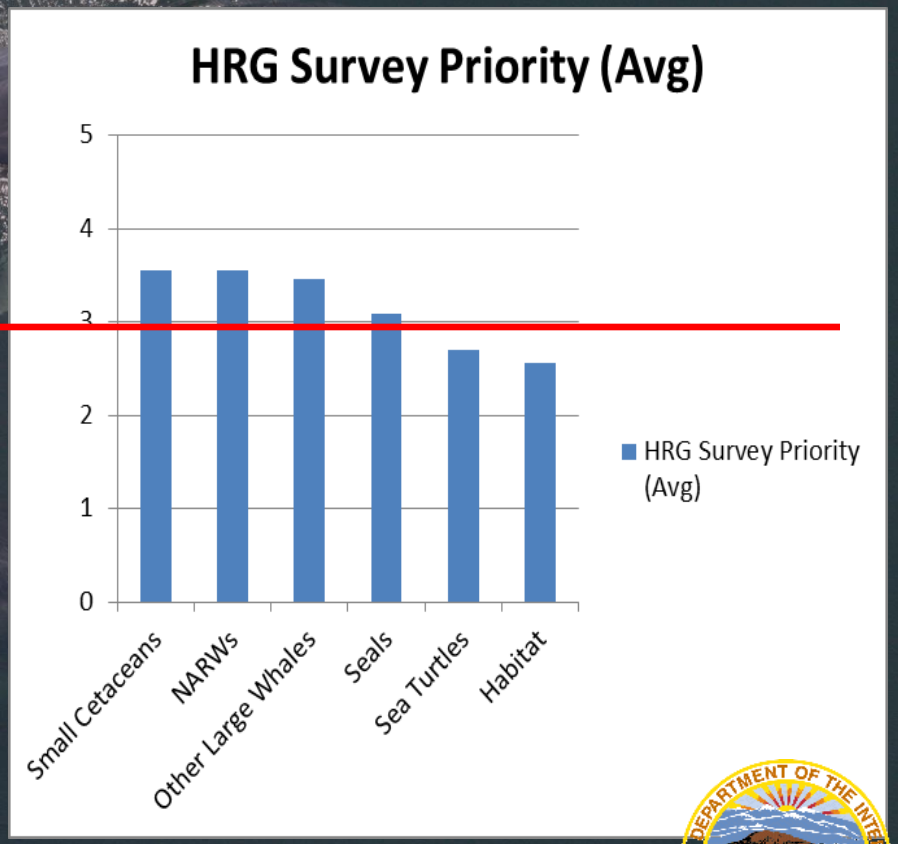
Pre-Workshop Panel Survey

What issues are most important to take on at this workshop?
What issues might need future work?

- 5 Species Groups
  - Small cetaceans (dolphins and porpoises)
  - North Atlantic right whales
  - Other large whales
  - Seals
  - Sea turtles
- 18 industry activities
- 34 routes of effects
- Scale of 1-5
- 3 and above indicates increasing level of adverse effect

Pre-Workshop Panel Survey





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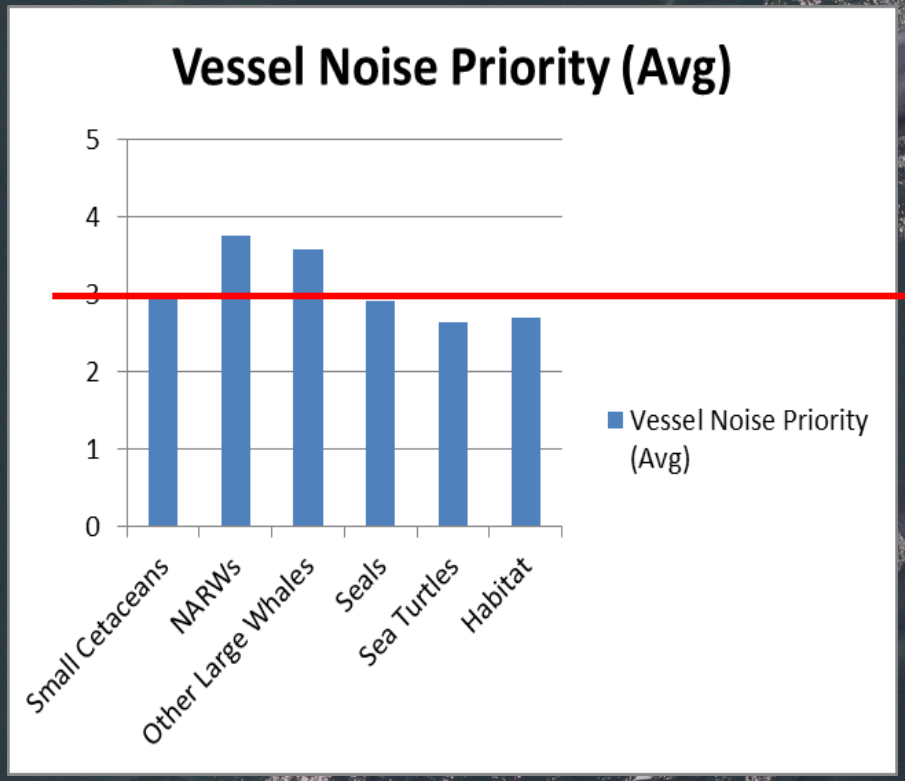

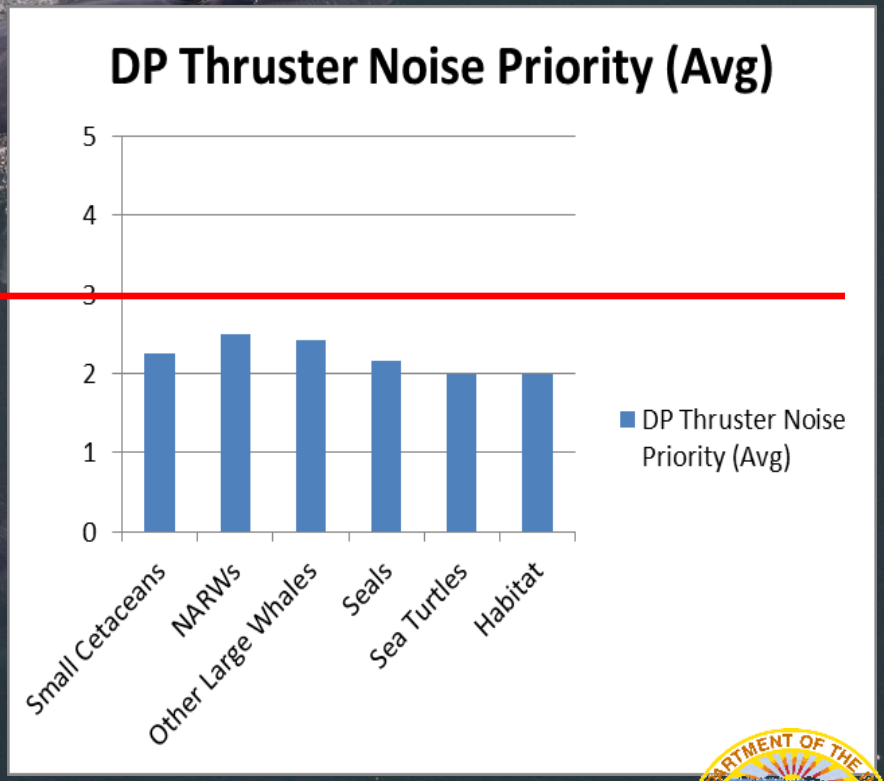

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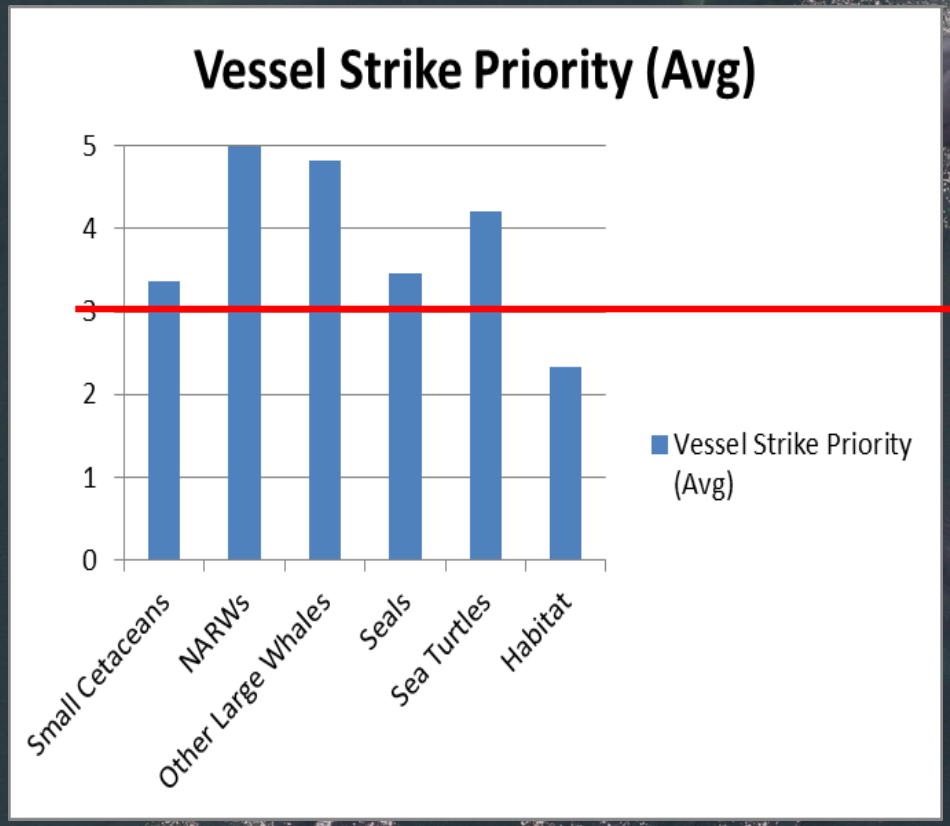

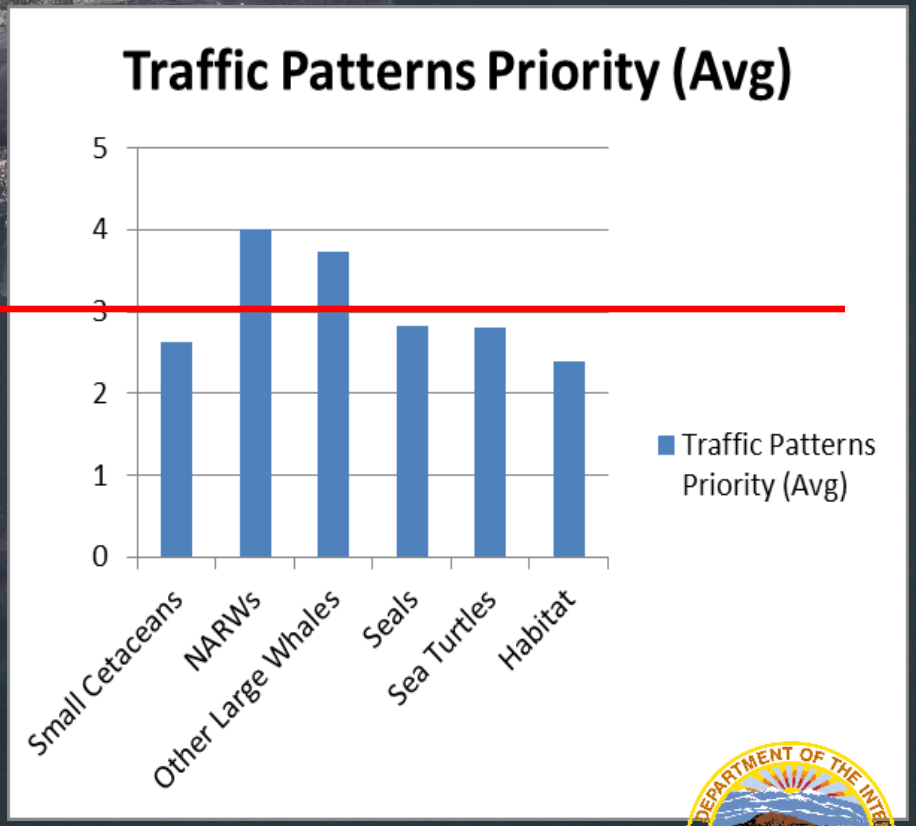

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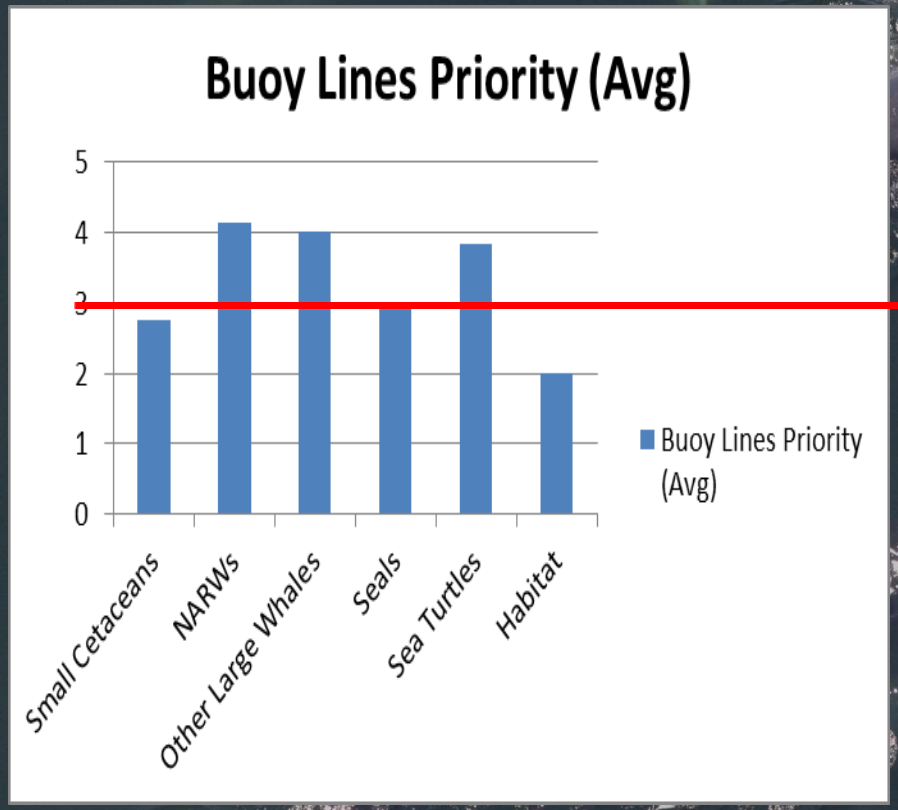

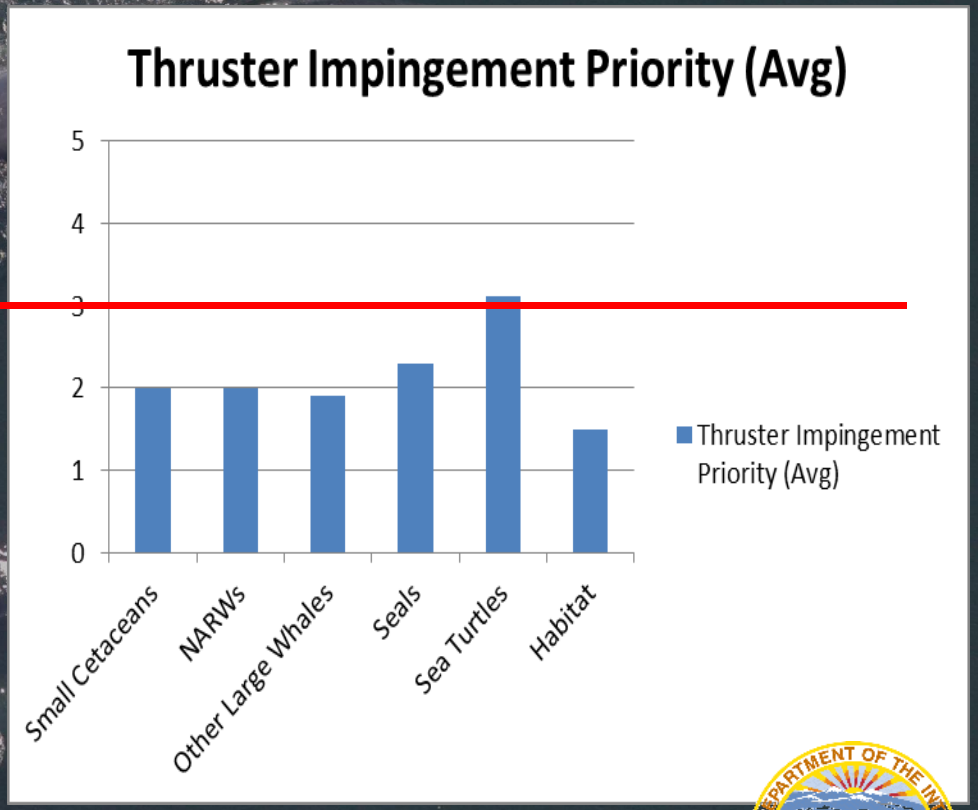

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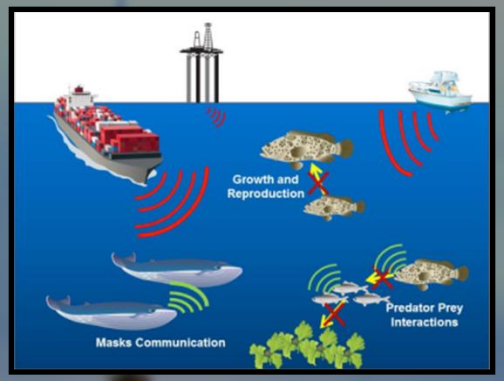
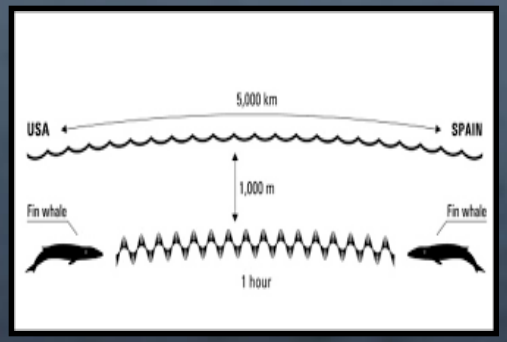
Mitigation and Monitoring of Underwater Noise

Noise Overview





- Sound is a primary means of communication, foraging, navigating and predator avoidance for marine mammals and other marine species
- Various cetacean species have been shown to alter vocalization frequencies or their behavior in the presence of ship noise and other anthropogenic activities
- Consequences/cost of noise exposure (behavioral, hearing damage, systemic or reproductive impacts) are unknown – especially on the population level
- Cumulative impacts remain a concern

Harassment from Sound Exposure Marine Mammal Protection Action (MMPA) Definitions

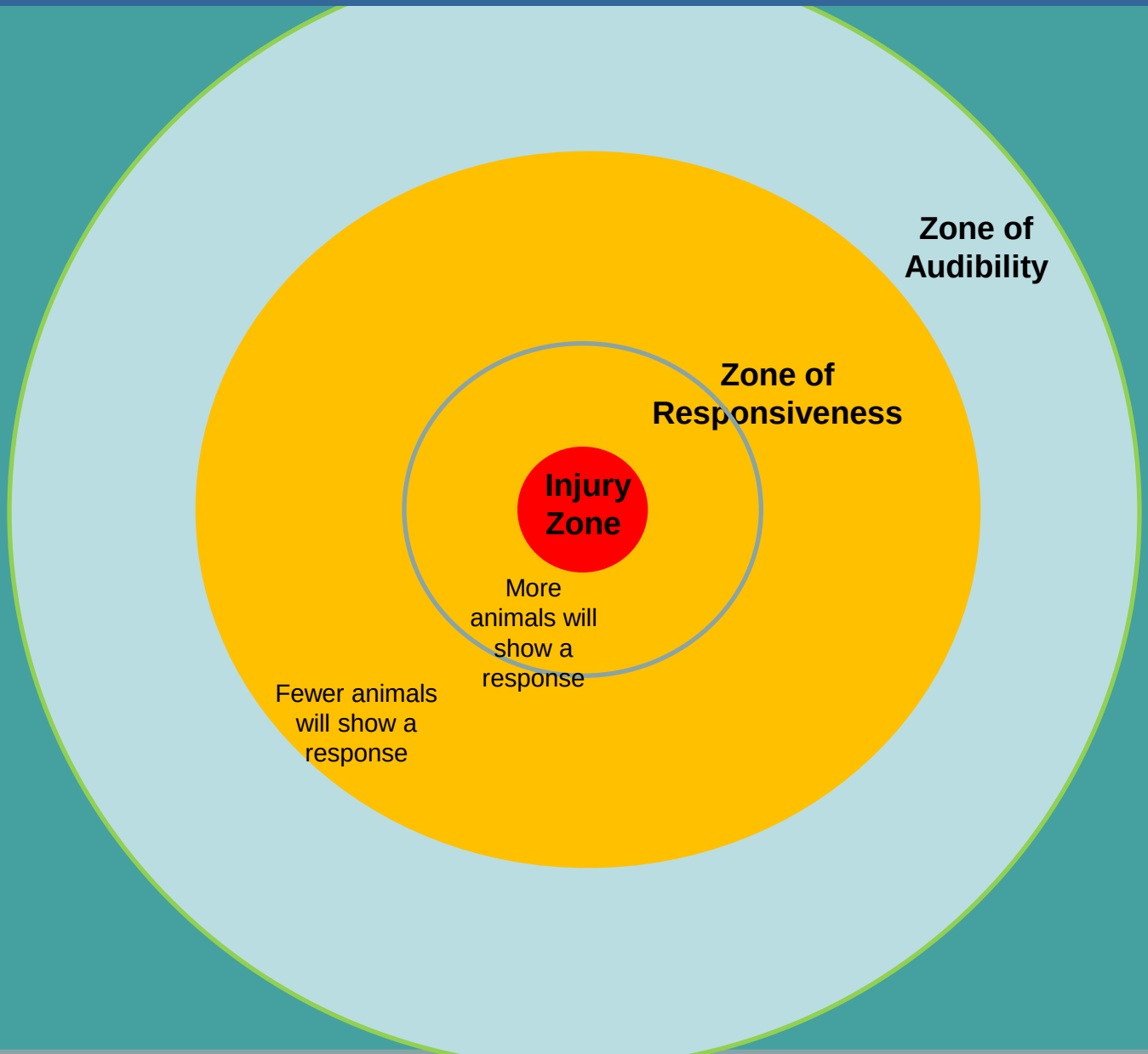
Level A Harassment

- has the *potential to injure* a marine mammal or marine mammal stock in the wild (ear injury)
- current focus of mitigation measures

Level B Harassment

- has the *potential to disturb* a marine mammal by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering but which does not have the potential to injure a marine mammal or marine mammal stock in the wild

Zones of Influence for Sound Based on Current Guidance



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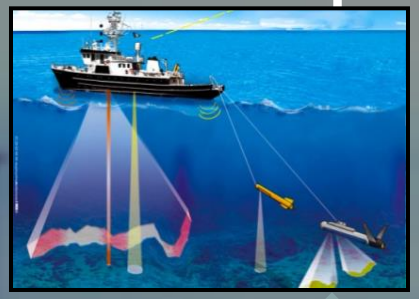
Noise-producing activities associated with the development of offshore wind facilities



HRG

Vessels

Construction: Drilling and Pile Driving

Operation & Maintenance

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Mitigation and Monitoring of Underwater Noise

OBJECTIVES

- Identify effective and practicable mitigations to minimize or avoid potentially harmful acoustic impacts from noise-producing activities
- Understand how to mitigate and monitor acoustic from both day and night activities
- How to the assess effectiveness of mitigation techniques
- Discuss standard data protocols, management, and data sharing of data

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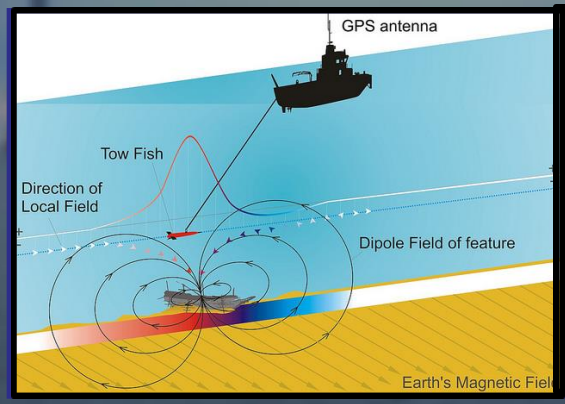
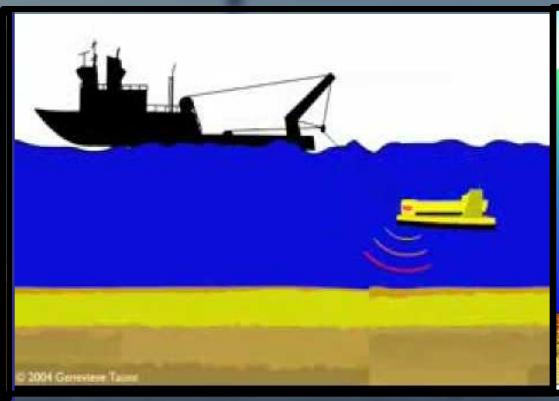
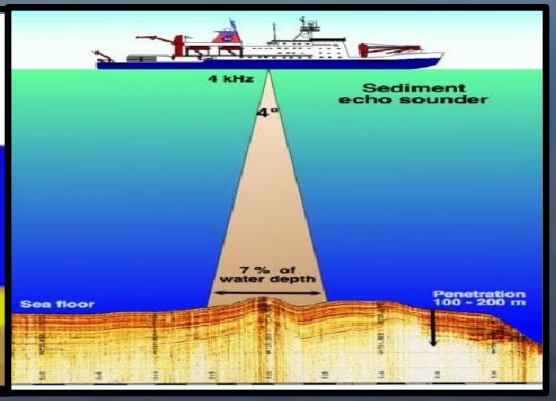
High-Resolution Geophysical Surveys







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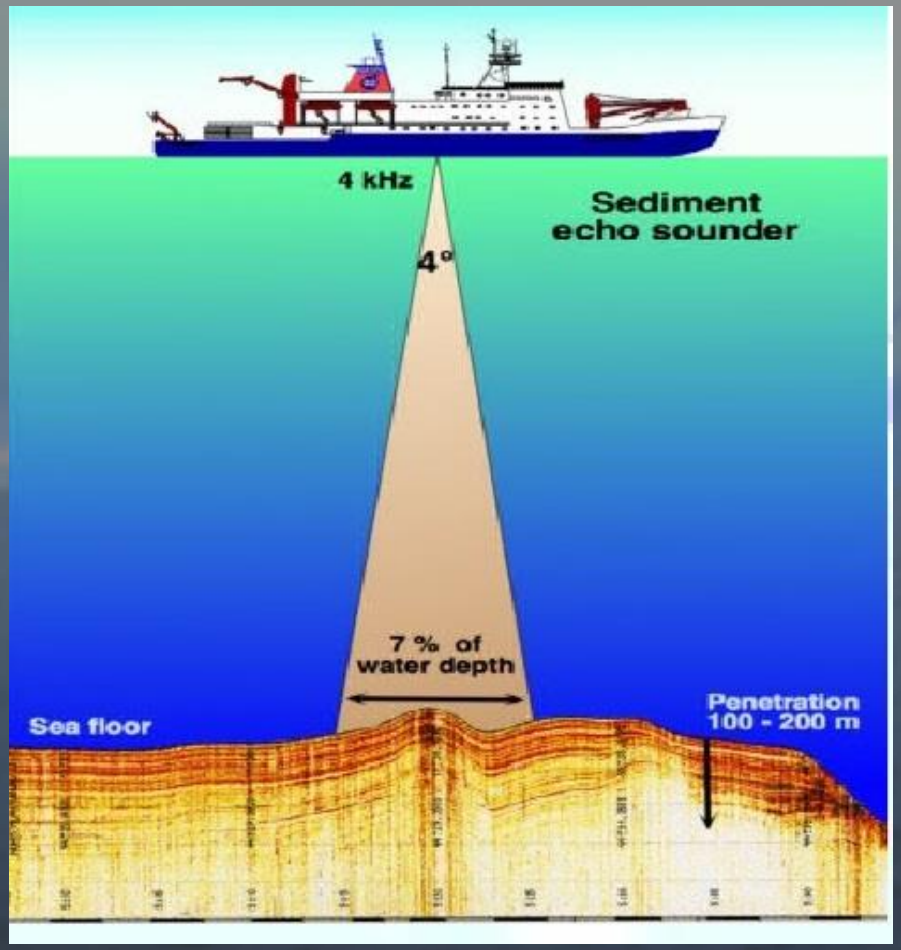
HRG Surveys



Purpose to collect geophysical info:

- Archaeological
- Geohazards
- Habitat
- Cable routes
- Sediment characteristics
- Unexploded Ordinance

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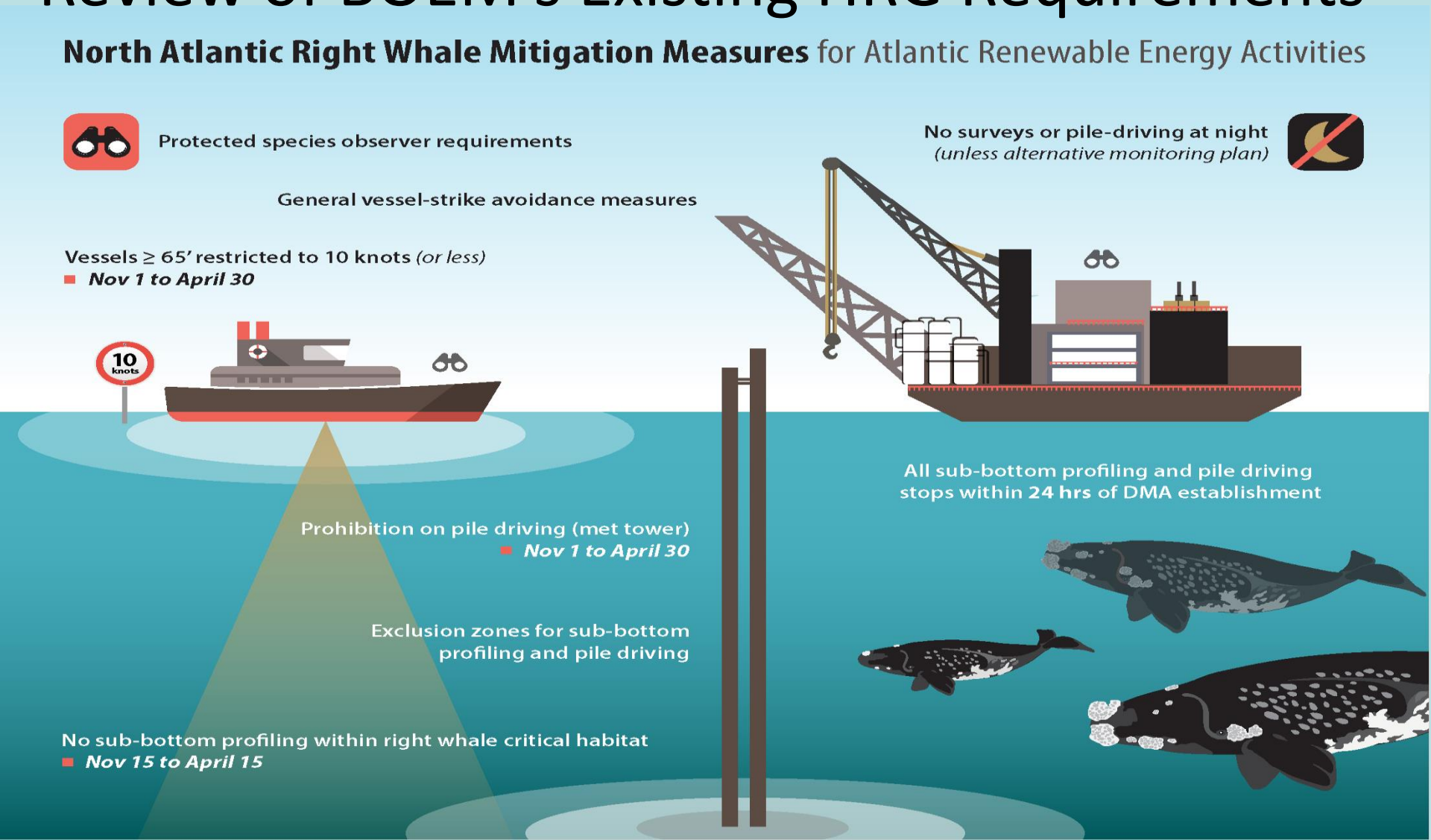
Review of BOEM's Existing HRG Requirements



Cumulative Sound Exposure Level Distances for HRG Survey Equipment

HRG SOURCE (Operating below 200 kHz)	PTS INJURY DISTANCE (m)			
	Low Frequency Cetaceans	Mid Frequency Cetaceans	High Frequency Cetaceans	Seals (Phocids)
Boomers	9	0	2	2
Sparkers, Mini-GI Gun, Bubble Gun (impulsive)	26	<1	95	13
Mini-GI airgun (impulsive)	20	0	45	8
Sub-bottom profilers	2	<1	36	<1
Multi-beam echosounder (100 kHz)	0	2	430*	<1

PTS injury distances were calculated with NOAA's sound exposure spreadsheet tool using sound source characteristics for HRG sources in Crocker and Fratantonio (2016)