BOEM
Bureau of Ocean Energy Management

KEARNS & WEST

Synthesis Report

Stakeholder Webinars to Inform Development of a Monitoring Plan for Marine Mammals in the Gulf of Mexico

Oil and Gas Industry: March 4, 2015, 12:00 pm – 2:00 pm EST
Environmental NGOs: March 4, 2015, 3:00 pm – 5:00 pm EST
Academia/Research: March 5, 2015, 12:00 pm – 2:00 pm EST
Federal Agencies: March 5, 2015, 3:00 pm – 5:00 pm EST

Prepared by Kearns & West
For the Bureau of Ocean Energy Management

April 15, 2015

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I. Introduction

This monitoring plan webinar synthesis report has been prepared for the Bureau of Ocean Energy Management (BOEM) by Kearns & West. The report presents summary findings from four, two-hour webinar sessions conducted on March 4th and 5th, 2015. The purpose of these webinars was to bring together representatives from four stakeholder sectors (oil and gas industry, environmental non-governmental organizations [NGOs], academia and research, and federal agencies) to help inform the development of a monitoring plan for marine mammals in the Gulf of Mexico (GOM). The monitoring plan will be specific to oil and gas geological and geophysical (G&G) activities in association with BOEM's petition to the National Marine Fisheries Service (NMFS) for rulemaking under Marine Mammal Protection Act (MMPA). The plan will serve as part of this petition to NMFS for rulemaking for incidental harassment related to seismic activities.

The **objectives** of the webinars were to:

- identify monitoring goals for marine mammals in the GOM related to G&G activities,
- determine the relevance and potential incorporation of ongoing monitoring programs and leverage opportunities, and
- identify ideas for the role and process of adaptive management.

The webinar agenda may be found in Appendix A.

Approximately 90 participants in total attended the four webinars representing a broad range of interests and perspectives. This included 30 representatives from the oil and gas industry sector, 8 from environmental NGOs, 30 from academia and research, and 20 from federal agencies (not including the webinar conveners from BOEM, NMFS, and the Bureau of Safety and Environmental Enforcement [BSEE]). See Appendix B for a list of all webinar participants and affiliations.

This Synthesis Report is organized into five main sections:

- Section I provides an **overview** of the webinars.
- Section II introduces the **background** and **context** of the monitoring plan.
- Section III summarizes **participant input around monitoring needs and goals**, including ongoing activities and data gaps relevant to marine mammals and G&G activities.
- Section IV summarizes **participant input around implementation considerations and recommendations**, including metrics for success, adaptive management examples, and potential impediments to effective monitoring programs.
- Section V outlines **next steps** in the monitoring plan development process.

Additional comments received by BOEM staff shortly following the webinars are compiled in Appendix C.

II. Background and Context

To help orient the webinar participants to the monitoring plan development process, BOEM staff provided background presentations on the Gulf of Mexico G&G Programmatic Environmental Impact Statement and the BOEM's MMPA Petition, the requirements for a monitoring plan for marine mammals, and a summary of monitoring plan development efforts to date.

A. Overview of Gulf G&G PEIS and MMPA Petition

Jennifer Bosyk and Kim Skrupky from BOEM described how BOEM, BSEE and NMFS are preparing a Programmatic Environmental Impact Statement (PEIS) that considers the environmental effects of all G&G survey activities in the GOM. Jennifer is the lead on the monitoring plan development, and Kim is overseeing the MMPA petition for rulemaking, of which the monitoring plan is part. Other core team members include: Stephanie Fiori, who is heading up the PEIS, Tre Glenn, who is overseeing the Endangered Species Act (ESA) section 7 consultation, and Jill Lewandowski and Ron Brinkman from BOEM; Deb Epperson from BSEE; and Ben Laws from NMFS.

BOEM intends for this PEIS to provide the necessary documentation and analyses to support informed decisions regarding future Outer Continental Shelf Lands Act permits for G&G activities on the outer continental shelf (OCS). It will identify and analyze appropriate mitigation measures to be used during future G&G activities on the OCS in support of the oil and gas, renewable energy, and marine mineral resource programs. This includes both pre-lease, more commonly referred to now as multi-client surveys, as well as G&G surveys related to a lease (ancillary surveys). It also establishes a framework for subsequent National Environmental Policy Act (NEPA) analyses for site-specific actions.

BOEM is applying on behalf of the oil and gas industry for rulemaking under section 101(a)(5)(A) of the MMPA. The PEIS will help BOEM support ongoing G&G permit applications in the GOM Region, as well as its petition to NMFS for a rulemaking under the MMPA. NMFS is a cooperating agency on the PEIS so that NMFS may use the PEIS in their NEPA and MMPA decision-making processes. Industry would apply for individual Letters of Authorization under the prescriptions set forth in a final rulemaking.

One more important component of this project is modeling of acoustic propagation and marine mammal exposures to sound. The modeling results will be incorporated into the PEIS, the MMPA application, and in BOEM's Biological Assessment submitted as part of consultation with NMFS under the ESA.

Section 101(a)(5)(A) of the MMPA and NMFS' implementing regulations at 50 CFR 216.104 require monitoring of the permitted activities that will increase the knowledge of the species and the level of take or impacts on populations of marine mammals that are expected to be present while conducting activities. BOEM chose to solicit expert information from stakeholders via the webinars to help determine the best way to meet these requirements. The Draft PEIS is expected to be published on March 4, 2016, and the Final PEIS is scheduled to be published on April 14, 2017.

B. Development of a Monitoring Plan for G&G Activities in the GOM

BOEM will include a monitoring plan in the MMPA petition that addresses several factors related to marine mammals and the potential impacts of G&G activities. BOEM seeks specifically to gain a better understanding of the relationships among G&G activities and the existing environment (source characterization, sound propagation, ambient sound levels). In general, the monitoring activities undertaken should accomplish one or more of the following goals:

- Increased probability of detecting marine mammals, both within defined zones of effect (thus allowing for more effective implementation of required mitigation measures) and in general to generate more data to contribute to additional analyses.
- Increased understanding of how many marine mammals are likely to be exposed to stimuli that we associate with specific adverse effects, such as behavioral harassment or hearing threshold shifts.
- Increased understanding of how marine mammals respond to stimuli expected to result in incidental take and how anticipated adverse effects on individuals may impact the population, stock, or species (specifically through effects on annual rates of recruitment or survival).
- Increased knowledge of the affected species.
- Increased understanding of the effectiveness of certain mitigation and monitoring measures.

BOEM put out a Request for Information on November 7, 2014 (79 FR 66402) to receive input on the development of this monitoring plan. BOEM and NMFS's vision for this monitoring plan is for it to be informative, integrated, and adaptive. In addition to asking for input on the monitoring plan criteria that NMFS outlines, BOEM also asked for information related to the scope of the monitoring plan and the role existing or planned efforts may play in addressing monitoring goals. In total, BOEM received 17 responses, including information from oil and gas industry stakeholders, NGOs, academics, and Federal agency stakeholders.

C. Monitoring Plan Progress to Date

BOEM is aware of a number of ongoing projects that could be leveraged as a part of this monitoring plan. BOEM has an internal Environmental Studies Program that can play a role in addressing monitoring goals; they regularly identify and fund projects in the GOM related to a number of issues, including marine mammals. BOEM is also aware of and actively engaged in both the National Oceanic and Atmospheric (NOAA) RESTORE 1604 Program and National Academy of Science (NAS) Gulf Research Program. Both of these programs will be developing funding opportunities, including environmental monitoring as one of their priorities.

Other relevant ongoing activities include:

- NOAA is leading a number of studies related to the Natural Resources Damage Assessment (NRDA) process triggered by the Deepwater Horizon spill. NOAA also provides stock assessment reports for marine mammals in the GOM.
- State agencies are also heavily involved in NRDA and both NOAA and the states are involved in stranding response.

- A number of academic institutions along the Gulf coast are involved in research related to the impacts of the Deepwater Horizon spill and studies of coastal bottlenose dolphins.
- The oil and gas industry conducts mitigation monitoring, and their Protected Species Observer (PSO) reports are submitted to the BSEE.
- The Joint Industry Programme (JIP) on Sound and Marine Life supports research to better understand the impacts of noise created by oil and gas exploration and production on marine life.

III. Monitoring Needs and Goals

BOEM and NOAA staff posed the following two key questions to webinar participants to solicit their input on monitoring needs and goals:

1) What **ongoing activities** are you aware of that address questions relevant to monitoring potential impacts of G&G activities?
2) What are the major **data gaps** for monitoring impacts to marine mammals from G&G activities?

The paragraphs below summarize key feedback and responses received during all four webinars.

A. Ongoing Monitoring Activities

In the four webinars, participants shared their knowledge of a variety of pertinent monitoring activities currently taking place in the GOM.

1. Oil and Gas Industry

Industry participants shared the following comments about ongoing activities:

- Bruce Mate gave a recent talk about his ongoing work in the GOM with sperm whales, which was funded by industry.
- Many monitoring activities in the GOM are not associated with specific requirements from BOEM or NMFS. BOEM needs to successfully integrate this information before moving forward with other requirements.

As part of this discussion, several industry representatives offered views about BOEM's monitoring planning process more generally. In particular, and consistent with a letter sent to BOEM during the fall 2014 Request for Information comment period and signed by the American Petroleum Institute, the International Association of Geophysical Contractors, and the Offshore Operators Committee, several participants shared the perspective that the MMPA does not require preparation of a monitoring plan for marine mammals in the GOM.

2. Environmental NGOs

Among key comments expressed, several environmental NGO participants emphasized the importance of looking outside of the GOM for relevant ongoing activities. These participants pointed out that acoustics research in particular is being conducted in other regions (e.g., Alaska) that could be beneficial to the monitoring plan, as the work involves species relevant to the GOM. Several participants also highlighted the need for increased interagency collaboration.

NGO participants mentioned the following relevant information and ongoing activities:

- The NRDC studies that were highlighted in their comment letter in response to BOEM's Request for Information.

- Long-term studies through the Research Consortia of the GOM Research Initiative.
- Passive Acoustics work at the University of Louisiana, Lafayette; Dauphin Island; C-IMAGE Consortium at the University of South Florida; and John Hildebrand's work with Scripps Institute of Oceanography.
- The Ocean Alliance has collected many biopsy samples from four different species in the GOM since 2010. They also conducted similar research in other parts of the world from 2000 to 2005 that could potentially be applied to the GOM.

3. Academia/Research

Participants from academia and research shared information on a wide variety of monitoring activities, including ongoing acoustics research in the GOM. Key comments included:

- BOEM and NOAA should look at the Arctic research pertaining to whale monitoring, calling range, and localization work on marine mammals.
- General behavioral impact research is still relevant to GOM marine mammals.
- Sperm whale tagging that has been conducted for several years in the GOM.
- There is available research in regards to sperm whale genetic identification and stock assessment that compares DNA samples. This is critical work for long-lived species and to assess stock structure over time.
- NRDA work includes a variety of recent stock assessment surveys both inshore and offshore. See also recent stock assessments by the Southeast Fisheries Science Center.
- John Hildebrand and Bruce Mate's groups (supported by Deepwater Horizon funding) from Scripps have relevant projects.
- NOAA's aerial shore surveys collected extensive data via the Navigation Response Team (NRT) process, which will be used in the ongoing stock assessment reports next year.
- More funding would allow for continued high-resolution investigation of whale movements and migratory behavior over next 3 years.
- The NRDA process funded by British Petroleum deployed 22 acoustic sensors from western Louisiana to Dry Tortugas National Park from 2010-2012, primarily to look at marine mammal responses to the Deepwater Horizon spill.
- Increased opportunities to collect baseline data will occur in the next few years as oil and gas development moves farther offshore and areas become more impacted.

4. Federal Agencies

Comments shared by Federal Agencies participants included:

- BOEM's involvement in passive acoustic monitoring with Cornell University and the Maryland Department of Natural Resources and the University of Maryland in waters offshore of Maryland could be used to inform future work in the GOM.
- NMFS will be conducting a marine mammal survey in the GOM in the summer of 2015.

B. Major Data Gaps

Participants from the four stakeholder sectors shared their views on important data gaps associated with the monitoring of impacts to marine mammals from G&G activities.

1. Oil and Gas Industry

Industry responses and comments included:

- BOEM should focus its data collection on the information needed to make management decisions.
- There are a lot of activities present in the GOM beyond G&G. BOEM may want to look at impacts from these as well (e.g., tourist industry, development in coastal areas, storm drains).
- It is difficult to separate marine mammal impacts due to G&G activities from other activities.

2. Environmental NGOs

Environmental NGO representative comments on data gaps included the following:

- Fundamental data gaps exist around abundance and distribution of offshore marine mammal stocks in the GOM. The study of impacts from multiple stressors needs this baseline information.
- Data gaps exist in the study of deepwater habitats.
- Data gaps exist for coastal species. This includes studies of passive acoustics, chronic stress (which was viewed as a major mechanistic impact from ocean noise and an obvious issue for the GOM) and new technologies (e.g., alternatives to air guns).
    - A data gap exists around coastal species of bottlenose dolphins (i.e., where they live, what they eat, etc.).
- Data need to be collected to support hypothesis testing around how marine mammals would respond to an oil spill.
- Data gaps exist around habitat abundance and noise impacts on different species.

3. Academia/Research

Among key comments expressed, multiple participants noted the absence of available baseline data. Several also noted that many surveys in the GOM are not designed for their intended uses, or are poorly designed, not streamlined, and difficult to assess redundancy.

Other comments about data gaps included:

- More abundance and distribution trend information is needed to help BOEM differentiate between population and individual level impacts:
    - Basic life history information is lacking for many marine mammal species.
    - There is a need for more data collection around stress impacts (e.g., hormone measurements).
    - There is a lack of basic natural history information on focal species, which continues to constrain much of the science that could be done (e.g., Bryde's whales have never been recorded, thereby obscuring any attempts for researchers to do acoustics monitoring on this species).
    - There have been good advances in recent research to show the abundances of toxins, but if discontinued, there will be difficulty in identifying trends and understanding the impacts of any activity.
- Data gaps exist around the status of specific GOM whale populations.
    - Coastline data are lacking.
    - Doing population and individual-level research to determine trends would be useful.
    - More Bryde's whale stock assessment information is needed.
    - Are there separate species of Bryde's whales?
    - The location of Bryde's whales.
- Data gaps exist around passive acoustic monitoring.
    - Models of sound propagation from seismic surveys may be underestimating the actual empirical propagation distances.
        - For example, these distances have been found to be widespread (from Cornell's sensors along the shelf rate, traces of survey patterns measured 500 – 600 km across the GOM), but this data is not reflected in the literature.
    - Under what sound exposure levels has it been found that sperm whales or other species would cease to be acoustically active?
        - For example, in the Arctic research for seismic activities, researchers have found that one of the first reactions baleen whales have to seismic activities is to go quiet. Thus, sperm whales or other species of interest in the GOM might cease to be acoustically active under similar conditions.

        - This could affect the ranges/circumstances for which passive acoustic monitoring would be effective.
    - There's very little knowledge of actual detection ranges of passive acoustic ranges in GOM.
        - Detection range is a function of the platform used, and while some estimates of noise are possible, it's important for BOEM to consider the realistic empirically-measured detection ranges of the key species in the GOM (single hydrophone recordings are useful, but localization capability should also be considered in order apply passive acoustics to other things such as population density).
- Data gaps exist around ecological data.
    - There is a data gap concerning the prey of marine mammals and impacts on prey species and populations from G&G activities.
    - G&G impacts are potentially ecosystem-wide, so narrowing the focus solely on marine mammals is misplaced.

4. Federal Agencies

Comments on data gaps made by federal agency representatives included:

- Gaps exist in evaluating the impacts of noise.
- Data gaps exist in the GOM around whether marine mammals in deep water and shallow water (on the continental shelf) should be treated as single stocks or multiple stocks.
- The Marine Mammal Commission (MMC) provided comments to BOEM's request in November, identifying things such as basic needs around occurrence and habitat use to determine location, water use at surface and at depth, what is already known about foraging, as well as recommended techniques with vessel and aerial-based surveys to explore these issues. More data are needed concerning how G&G surveys are contributing to the overall soundscape in the GOM.
- There is a gap in connecting behavioral response data with the exposures of G&G activities.
- Better methods to measure and interpret data on the physiological effects of stress on offshore cetaceans are needed.
- More data are needed on the factors affecting reproductive success and failure in cetaceans. A gap exists with regard to how this relates to cumulative impacts and G&G in the GOM.
- There are no prey-based studies in deep water.

IV. Implementation Considerations and Recommendations

BOEM and NOAA conveners requested that webinar participants provide input on three topics related to implementation considerations for monitoring:

1) **Effective metrics** to measure success in monitoring.
2) Advice on **managing adaptively**.
3) What are **potential impediments to effective monitoring programs**?

Participant responses are summarized below.

A. Effective Metrics to Measure Success

BOEM staff invited webinar participants to help define what successful monitoring for G&G activities would look like, especially with regard to metrics. Key comments are listed below.

1. Oil and Gas Industry

- Any metrics should have a data quality element associated with them.
- Navy and NMFS monitoring plans could serve as good models.
- The monitoring plan should establish clear goals and include research that industry and other agencies are already conducting in the GOM and other areas.
- The monitoring plan should relate to the actual risks that G&G activities impose and determine if mitigation is matching that risk.
- Monitoring goals should be within the scope of the MMPA and other regulations.
- Consider how to improve the data collection and how those data are fed back into recommendations of research, monitoring and effective mitigation.

2. Environmental NGOs

- Monitoring should be hypothesis-driven (rather than effort-based) and designed to answer specific questions about topics such as distribution and noise impacts. This will help determine if the monitoring works, if mitigation is effective, and will help to answer specific questions regarding marine mammals.
    - The monitoring plan should be able to assess how successfully questions have been answered. This is an opportunity to determine the major questions about offshore species and address the acute and chronic impacts.
- Some metrics need to be based on population trends (e.g., to help determine the effects of seismic surveys on populations over time). This may be difficult without good baseline data in the GOM, but it is necessary to know effects of activities on marine mammals.
- New technologies should be monitored.

3. Academia/Research

- To address stock assessment questions, it's important to get good estimates on population trends.
- The monitoring needs to be sensitive enough to detect effects in the first place.
- The monitoring framework should provide information on trends and what is driving those trends (e.g., the impacts of individual effects on population effects and vice versa). Participants mentioned the Population Consequences of Disturbance (PCoD) model.

4. Federal Agencies

- Trends and abundance need to be measured.
- We need to assess the effectiveness of monitoring mechanisms (e.g., assess the success of passive acoustic monitoring).
- The Navy is moving away from trying to evaluate compliance regarding monitoring and toward trying to better evaluate success (i.e., whether the monitoring was worthwhile or not). This type of evaluation is subjective; it requires expert input to help evaluate progress.

B. Adaptive Management Advice and Examples

BOEM intends to include a process for managing adaptively in the monitoring plan. BOEM staff asked webinar participants to share how they have incorporated adaptive management into other monitoring efforts in the GOM or elsewhere. Key responses are listed below.

1. Oil and Gas Industry

- Adaptive management is a critical component for industry, because industry sees a trend toward increasing mitigation requirements and would like to have a process for evaluating and decreasing mitigation requirements where appropriate.
- Adaptive management has to start with a baseline that reflects the best scientific information at the time and an assessment of relative risks. Nothing should be indefinite.
- A robust process is needed to test new technologies and methodologies, as one size does not fit all.
- The Navy and NMFS have moved to a hypothesis/question-oriented adaptive management process (e.g., ask if there is a new technology, test and evaluate it, and then decide to use it or not). The evaluation process is the key component.

2. Environmental NGOs

- An example of successful adaptive management is Germany's work in the North Sea with harbor porpoises, where the primary concern was construction noise associated with offshore wind farm construction. They started with modeling at the beginning for different management decisions, and then created a monitoring program to confirm their hypothesis, and finally determined if the management decision was effective.
    - One or two studies have been done to provide a basis for testing that pile driving would reduce foraging success in harbor porpoises within a certain distance.
- There is a need for structural transparency among the decisions that agencies are making in light of the data. Currently, this is not working in the context of the Navy.

3. Academia/Research

- It is difficult to get support or buy-in from industry for the science if industry believes it will be penalized as a result. This can severely handicap the quality of the science.
- It is important for researchers to adjust surveys in a way that supports adaptive management.
- Adaptive management works by having researchers assess whether specific measures have been successful, and then implement changes as needed to ensure effectiveness. Examples of adaptive management include:
    - Management of ship-whale strikes (right whales) on the East Coast.
    - Greenridge's acoustic work in Alaska with Bowhead whale responses to noise.
- A problem with adaptive management concerns the potential lag effects that may not show up until it is too late to reverse them. Researchers should be honest and cognizant about this. Adaptive management may be more difficult for species that are slower to show population effects.
- Oregon State University is conducting similar work off the west coast called Whale Watch. The intent is to develop a habitat model from tracking data to predict whale abundance in a real time way. Managers can use the tracking data to identify potential increased risk from shipping traffic. BOEM could develop a predictive model in the GOM using similar tracking data.

4. Federal Agencies

- An adaptive management approach is a good idea because it takes time to develop necessary information in the GOM.
- An advisory group would be helpful to sort through the wide variety of information and ensure that all resources are leveraged effectively, especially any resources that might come out of the Deepwater Horizon case.

- Effectively involving stakeholders in the process is critical for adaptive management. Some examples:
  - The Navy has an annual, formal meeting with NMFS focused not only on current happenings in science and monitoring, but also to discuss other issues such as the amount of sonar, explosives, or other concerns throughout year.
    - In the Atlantic region, the Navy invites NMFS and the MMC to sit down with all researchers and discuss what changes should be made to projects in the coming year, and what they want out of it. This allows NMFS to better understand how the science is changing.

C. Potential Impediments to Effective Monitoring Programs

BOEM staff invited webinar participants to share their views on potential factors that could serve to impede effective monitoring programs. Key comments are listed below.

1. Oil and Gas Industry

- A challenge for industry is that while industry participants want to be effective collaborators, they are also competitors.
- Agencies do not always incorporate the data generated through monitoring.
  - For example, the JIP's work with bottlenose dolphins which showed they were able to handle certain levels of sound.
  - Another example comes from the use of vocalizations to conduct density estimations. NOAA scientists were reluctant to incorporate the information because the density estimates were not gathered through the traditional method of transect surveys.
- Lawsuits affect the industry's work, and essentially drive the whole process.
- BOEM should keep operational limits in mind when creating monitoring and reporting requirements.

2. Environmental NGOs

- Differences between what the environmental community thinks is credible research and what industry thinks is credible research can serve as an impediment to effective monitoring.
- Current funding structures do not encourage collaboration. Different research teams are not coordinating closely enough.
- More money needs to go into researching new technologies (to support hypothesis-driven work).
- Mechanisms are needed to more effectively gather, transmit, and share data.
- Given the size of the GOM, data collection must be done strategically (i.e., to achieve specific purposes). There is a challenge to creating a monitoring plan that generates good data that tells something, rather than just gathering a breadth of data over the GOM.

- The monitoring plan should gather significant data that drives the monitoring system, including significant impacts and how to mitigate those impacts.
    - Monitoring questions should be hypothesis-driven, and not too general.
    - Funding constraints have defunded some important research.
- BOEM faces a credibility challenge if it is viewed as pursuing research too focused on supporting industry.

3. Academia/Research

- Adequate and sustainable funding is a key impediment to long-term monitoring. This comment was made by several webinar participants.
- Impediments related to data include:
    - Limited access to data collected by different institutions and individuals.
    - Lack of standardized protocols and a repository for collecting data.
    - Lack of transparency in data collection.
- The lack of a long-range vision for needed science is a key impediment. Effects at the population level may not be detectable for decades.
- There is insufficient knowledge of population structures (e.g., knowledge of distribution, trends, etc.).
- The GOM is an isolated, marginal sea, which has allowed specialization among the cetacean population. An improved understanding of this stock structure at the population level will be key.
- Spatial coverage poses an issue, as the GOM is a huge area commitment to monitor.
    - A notable precaution is to avoid extrapolation.
- Improved coordination is needed with Mexico and Cuba for species that migrate.
- There is a need to pinpoint the effectiveness of the mitigation currently done around seismic programs (i.e., seismic zones and marine mammal observers).
    - How quantitatively effective is it?
    - To what degree are we safeguarding marine mammals with these measures?
- It is not clear how impacts from different activities are going to be teased apart.
- It is important to make the results of monitoring studies more accessible to others.
- Research around the impacts of Deepwater Horizon should be better organized and less complicated to help avoid redundancy.

4. Federal Agencies

- There is limited research capacity in the GOM due to limited funding and a large research area. This impedes long-term survey commitments and creates competition for scarce resources. Monitoring will always fall short of needs.
    - A solution is to create partnerships and foster an atmosphere of information and funding sharing to attract more individuals to work in GOM research (i.e., graduate students).

    - It is difficult for the broader community to look at the monitoring results more holistically.
- Access to data is limited. Improved access to data would allow the different monitoring plans to contribute to a better understanding of what is happening in the GOM.
- There is uncertainty around the role of industry in long-term monitoring.

V. Next Steps

BOEM staff expressed appreciation to webinar participants for their input on the monitoring planning process and informed them that a summary of the webinars would be made available to webinar participants in the coming weeks.

BOEM is planning to submit the draft MMPA petition, including the draft of this monitoring plan, to NMFS by the end of 2015. NMFS will publish a Notice of Availability in the *Federal Register*. There will be an additional opportunity for public comment on the petition, including the monitoring plan, at that time.

Appendix A: Sample Agenda
(same for all four webinars)

Development of a Monitoring Plan for Marine Mammals in the Gulf of Mexico
March 4 and 5, 2015
12:00-2:00 pm and 3:00-500 pm EST
Webinar Link: ***https://kearnswest.adobeconnect.com/enter?m=gulfmp***
Follow webinar instructions to join audio or call-in directly:
Call-in Number: *1-866-244-8528*
Participant Passcode: *#640961*

Meeting Purpose
The purpose of this webinar is to bring together stakeholders from the [stakeholder sector] to help inform the development of a Monitoring Plan for marine mammals in the Gulf of Mexico (GOM) specific to geological and geophysical (G&G) activities in association with the Marine Mammal Protection Act (MMPA) rulemaking.

Meeting Objectives*:*
- To identify monitoring goals for marine mammals in the GOM related to G&G activities;
- To determine the relevance and potential incorporation of ongoing monitoring programs and leveraging opportunities;
- To identify ideas for the role and process of adaptive management.

Time	Item
15 min prior	*Log into webinar*
12:00 pm/ 3:00 pm	**Welcome, Introductions, and Agenda Review** ➢ Review meeting agenda and objectives
12:15 pm/ 3:15 pm	**Background and Context** ➢ Overview of Gulf G&G PEIS and MMPA Petition ➢ Development of a Monitoring Plan for G&G activities in the GOM ➢ Progress to Date ➢ *Clarifying Questions*
12:30 pm/ 3:30 pm	**Monitoring Needs and Goals** 1. What ongoing activities are you aware of that address questions relevant to monitoring potential impacts of G&G activities? 2. What are the major data gaps for monitoring impacts to marine mammals from G&G activities?
1:00 pm/ 4:00 pm	**Implementation Considerations and Recommendations** 1. What metrics should be used to measure success in monitoring? 2. Share advice on managing adaptively (with examples). 3. (Time permitting) What are potential impediments to effective monitoring programs?
1:50 pm/ 4:50 pm	**Wrap Up & Next Steps**
2:00 pm/ 5:00 pm	*Adjourn*

Appendix B: Webinar Participant Rosters

Industry (March 4, 12:00–2:00 pm EST)

	First Name	Last Name	Organization
1	Alan	Lindsey	Hess Corporation
2	Andre	Metzler	Schlumberger / WesternGeco
3	Andy	Radford	API
4	Bernard	Padovani	SEICHE Measurements
5	Bill	Anderson	UK Ports
6	Cynthia	Pyc	BP
7	David	Hedgeland	PGS
8	David	O'Hara	RPS
9	James	Thompson	Crown Relocations
10	Jeff	Mayville	Schlumberger
11	Ken	Barker	ConocoPhillips
12	Kristen	Dill	ConocoPhillips
13	Kristine	Lynch	Shell
14	Laura	Schut	Hess Corporation
15	Louis	Brzuzy	Shell
16	Maria	Ragazzo	Petroleum Geo-Services
17	Melissa	Simpson	BP
18	Nikki	Martin	IAGC
19	Peter	Evans	BP
20	Peter	Seidel	TGS
21	Poh Boon	Ung	BP
22	Quenton	Dokken	GOM Foundation
23	Roy	Bampton	Dolphin Geophysical
24	Ruth	Perry	Shell Exploration & Production Company
25	Sarah	Tsoflias	Chevron
26	Scott	Michell	BP
27	Scott	Slaughter	Center for Regulatory Effectiveness
28	Stephanie	Milne	RPS
29	Steven	Fishburn	PGS

Environmental NGOs (March 4, 3:00–5:00 pm EST)

	First Name	Last Name	Organization
1	Cynthia	Sarthou	Gulf Restoration Network
2	Iain	Kerr	Ocean Alliance
3	Kristen	Monsell	Center for biological diversity
4	Matt	Love	Ocean Conservancy

5	Michael	Jasny	NRDC
6	Patrick	Lyne	Irish Whale and Dolphin Group (IWDG)
7	Stephanie	Watson	GOM Coastal Observing System

Research/Academia (March 5, 12:00-2:00 pm EST)

	First Name	Last Name	Organization
1	Aaron	Rice	Cornell University
2	Aaron	Thode	SIO
3	Bruce	Pudney	CSA
4	Christoph	Richter	University of Toronto Mississauga
5	Daniel	Palacios	Oregon State University
6	Delphine	Shannon	Institute for Marine Mammal Studies
7	Douglas	Nowacek	Duke University
8	Eric	Pulis	IMMS
9	James H.	Miller	University of Rhode Island
10	Jim	Byous	CSA
11	Jonathan	Pitchford	IMMS
12	Julie	Oswald	Bio-Waves, Inc.
13	Katherine	Kim	Greenridge Sciences Inc.
14	Kim	Olsen	CSA Florida
15	Ladd	Irvine	Oregon State University
16	Landry	Bernard	GCOOS
17	Lindy	Weilgart	Dalhousie University
18	Mary Jo	Barkaszi	CSA Ocean Sciences
19	Michele	Halvorsen	CSA Ocean Sciences Inc
20	Moby	Solangi	IMMS
21	Paula	Moreno	Gulf Coast Research Laboratory, University of Southern Mississippi
22	Randall	Reeves	Marine Mammal Commission
23	Rebecca	Snyder	EHS Support
24	Robert	Arnone	University of Southern Mississippi
25	Ryan	Vandermeulen	University of Southern Mississippi
26	Scott	Baker	Oregon State University
27	Stefanie	Gazda	University of Massachusetts
28	Steve	Stanic	University of Southern Mississippi
29	Tom	Norris	Biowaves
30	Tony	Martin	CSA

Federal Agencies (March 5, 3:00-5:00 pm EST)

	First Name	Last Name	Organization
1	Allison	Hernandez	BOEM
2	Carolyn	Ruppel	USGS

3	Danielle	Buonantony	Navy
4	David	Aldridge	Sandia National Laboratories
5	Desray	Reeb	BOEM
6	Evonne	Tang	The National Academies
7	Holly	Smith	NSF
8	Jaclyn	Taylor	NOAA Fisheries Office of Protected Resources
9	Jake	Levenson	BOEM
10	Jamison	Smith	NOAA Fisheries Greater Atlantic Regional Fisheries Office
11	Jessica	Mallandine	BOEM
12	Joel	Bell	Navy
13	Keith	Mullin	NOAA Fisheries Southeast Fisheries Science Center
14	Kellie	Taylor	NOAA Fisheries Office of Protected Resources
15	Kyle	Baker	NMFSNOAA Fisheries Southeast Regional Office
16	Laura	Engleby	NOAA Fisheries Southeast Regional Office
17	Leila	Hatch	NOAA Ocean Service Office of National Marine Sanctuaries
18	Lori	Schwacke	NOAA Ocean Service National Centers for Coastal Ocean Science
19	Paula (Kaye)	London	BOEM
20	Peter	Thomas	MMC
21	Rebecca	Green	BOEM
22	Stan	Labak	BOEM
23	Stephanie	Watwood	NUWC -US Navy (Undersea Warfare Center)
24	Teri	Rowles	NOAA Fisheries Office of Protected Resources
25	Vicki	Cornish	MMC

Support Staff

	First Name	Last Name	Organization
1	Ben	Laws	NOAA Fisheries Office of Protected Resources
2	Deb	Epperson	BSEE
3	Eric	Poncelet	Kearns & West (facilitation team)
4	Jason	Gershowitz	Kearns & West (facilitation team)
5	Jennifer	Bosyk	BOEM
6	Jessica	Franks	Kearns & West (facilitation team)
7	Jill	Lewandowski	BOEM
8	Kim	Skrupky	BOEM
9	Tre	Glenn	BOEM

Appendix C: Select Webinar Feedback

Below is a compilation of immediate feedback following the ENGO and Research/Academia webinars from two webinar participants:

1. Environmental NGO:

Patrick Lyne, Irish Whale and Dolphin Group (IWDG)

	Comment
1	Mitigation data could and should be used to obtain some information on species distribution. However all data is valid when trying to assess the impact of seismic surveys.
2	Record and post mortem exams of dead animals? Fish? Mammals, turtles, etc
3	Photos of sightings in datasheets with specific size 1 to 3 per sighting allowed, thumbnail size, to check id.
4	Add qualifications worksheet for PSOs and PAM ops.
5	Aerial surveys before during and after seismic surveys in an area to assess reaction of animals to surveys?
6	Make sightings and environmental data publicly available via internet website.
7	Review PSO reports and comments and enquiries from regulator. Allow PSOs to see regulator engaged in process.
8	There is an ECS workshop (March 21st – Malta) on the developments in mitigation looking at various technologies such as Active Acoustics, Passive Acoustics using the streamers, Advances in thermal imaging and PAM. Some of these could also be used to improve baseline survey data.
9	Soft starts and exceeding gun volume on soft starts may be a worry if excessive gun testing of arrays required. Require soft start samples and prohibit use of gun volume in excess of that stated in license and assessments for survey.
10	Metrics in monitoring – PAM not reliable for baleen whales and probably never will be but if numbers of sightings vastly exceed PAM detections then PAM should not be relied on for clearance of mitigation zone at night or during poor visibility. Baleen whales if seen in numbers should require a prevention of night time start up unless successfully located by PAM. All and

	any PAM detections over 30 kHz should be treated as within the mitigation zone and require shut down. Any baleen whale detection currently should require a shutdown. Detections requiring a shutdown must be recorded and a screen shot of spectrogram or the detectors must be included in the report.
11	Encourage observer rotation and breaks.
12	Require observers to carry cameras and photograph observations especially where shutdown is required.
13	The 24 hour use of PAM improves detection rates and range finding.

2. Academia/Research

Steve Stanic, University of Southern Mississippi

1	An example of adaptive management is the Stellwagen Bank NMS and re-routing of ship lanes.
2	Explore the Navy's data for propagation modeling. They work well (reach out to the Naval Research Lab if necessary).