
From: "Al Sears" <alsears4@gmail.com>
To: <ITP.Goldstein@noaa.gov>
Sent: Wednesday, June 29, 2011 5:59 PM
Subject: Comments on ITR, 76 Fed. Reg. 34657

Thank you for this opportunity to comment. I strongly urge the Fisheries Service to adopt the strictest mitigation measures possible to protect marine mammals in the Gulf of Mexico from harm caused by seismic exploration. Of particular importance are areas such as Mississippi and DeSoto Canyons, home to sperm whales and Bryde's whales, respectively. Coastal areas that support bottlenose dolphins and manatees, for example, must also be afforded strong protections. Lastly, the Fisheries Service should ensure that duplicative surveys are eliminated and develop a cumulative noise budget in order to protect these critical habitats further.

Thank you again for your consideration.

Al Sears
420 S. Irena Avenue
Redondo Beach, CA 90277
US

From: "Ariel Larson" <adebroux@wisc.edu>
To: <ITP.Goldstein@noaa.gov>
Sent: Tuesday, June 28, 2011 7:31 PM
Subject: Comments on ITR, 76 Fed. Reg. 34657

Thank you for this opportunity to comment. I urge the Fisheries Service to adopt the strictest mitigation measures possible to protect marine mammals in the Gulf of Mexico from harm caused by seismic exploration. The Fisheries Service should limit seismic exploration in the Gulf of Mexico, which can hurt whales and dolphins.

In particular, the Fisheries Service should prohibit seismic surveys in areas of high biological importance. Such areas include Mississippi Canyon, which is important habitat for the Gulf's small, biologically distinct population of sperm whales, and DeSoto Canyon, which also provides sperm whale habitat and is the area where Bryde's whales are most commonly seen in the Gulf. Seismic surveys in coastal areas should be restricted to protect bottlenose dolphins and manatees.

In addition to protecting sensitive habitats, the Fisheries Service should implement measures that will reduce the total amount of noise being introduced into the marine environment as much as possible. In particular, the Service should ensure that duplicative surveys are eliminated and develop a cumulative noise budget.

Ariel Larson
925 Haywood Dr
Madison, WI 53715
US

From: "Bobbie Gonzales" <gogogonz@hotmail.com>
To: <ITP.Goldstein@noaa.gov>
Sent: Tuesday, June 28, 2011 3:25 PM
Subject: Comments on ITR, 76 Fed. Reg. 34657

We have learned more about our planet and it's inhabitants. Twenty years ago, we did not realize what our geographic explorations could do. Now, we understand that our methods injured and disrupted the mammals in our oceans.
Please work on a law that places value on our fishing industry and protection for the mammals of the sea.

Bobbie Gonzales
Box 5403 NDCBU
Taos, NM 87571
US

From: "Caitlin Rickey" <pinkpanthaluva91@yahoo.com>
To: <ITP.Goldstein@noaa.gov>
Sent: Wednesday, June 29, 2011 12:06 PM
Subject: Comments on ITR, 76 Fed. Reg. 34657

Please reconsider your current efforts in oil exploration due to the damage ensuing both on sea creatures and their habitat.

Caitlin Rickey
Devereux
Peoria, IL 61614
US

From: "Cecilia Meza" <ugogrrl@att.net>
To: <ITP.Goldstein@noaa.gov>
Sent: Wednesday, June 29, 2011 12:59 AM
Subject: Comments on ITR, 76 Fed. Reg. 34657

Thank you for this opportunity to comment. I urge the Fisheries Service to adopt the strictest mitigation measures possible to protect marine mammals in the Gulf of Mexico.

In particular, the Fisheries Service should prohibit seismic surveys in sperm whale habitats and areas where Bryde's whales are most commonly seen in the Gulf. Surveys in coastal areas should be restricted to protect dolphins and manatees.

The Fisheries Service should also reduce the amount of noise being introduced into the marine environment as much as possible. In particular, the Service should ensure that duplicative surveys are eliminated and develop a cumulative noise budget.

Cecilia Meza
370 Park Street
San Francisco, CA 94110
US

From: "Deborah Roth" <droth7@rocketmail.com>
To: <ITP.Goldstein@noaa.gov>
Sent: Thursday, June 30, 2011 6:42 PM
Subject: Comments on ITR, 76 Fed. Reg. 34657

Please adopt the strictest mitigation measures possible to protect marine mammals in the Gulf of Mexico from harm caused by seismic exploration. Please limit seismic exploration in the Gulf of Mexico to protect whales and dolphins.

Thanks for considering my view.

Deborah Roth
5825 E. Leisure Lane
Carefree, AZ 85377
US

From: "Dorothy Leach" <naftz78@aol.com>
To: <ITP.Goldstein@noaa.gov>
Sent: Tuesday, June 28, 2011 7:25 PM
Subject: Comments on ITR, 76 Fed. Reg. 34657

Thank you for this opportunity to comment. I urge the Fisheries Service to adopt the strictest mitigation measures possible to protect marine mammals in the Gulf of Mexico from harm caused by seismic exploration. The Fisheries Service should limit seismic exploration in the Gulf of Mexico, which can hurt whales and dolphins.

In particular, the Fisheries Service should prohibit seismic surveys in areas of high biological importance, such as Mississippi Canyon, and DeSoto Canyon.

The Fisheries Service should also implement measures to reduce the total amount of noise being introduced into the marine environment as much as possible. In particular, the Service should ensure that duplicative surveys are eliminated and develop a cumulative noise budget.

Dorothy Leach
78 Naftzinger Rd.
Annville, PA 17003
US

From: "Gabriela Borda De Hasty" <gaby_angelus@hotmail.com>
To: <ITP.Goldstein@noaa.gov>
Sent: Tuesday, June 28, 2011 3:12 PM
Subject: Comments on ITR, 76 Fed. Reg. 34657

Thank you for this opportunity to comment.
I urge the Fisheries Service to prohibit seismic surveys in areas of high biological importance in order to

protect marine mammals in the Gulf of Mexico, like whales and dolphins.

In addition to protecting sensitive habitats, the Fisheries Service should implement measures that will reduce the total amount of noise being introduced into the marine environment as much as possible. In particular, the Service should ensure that duplicative surveys are eliminated and develop a cumulative noise budget.

Gabriela Borda De Hasty
PO Box 770
DUDLEY, NC 28333
US

From: "Glenda Denniston" <denniston@wisc.edu>
To: <ITP.Goldstein@noaa.gov>
Sent: Tuesday, June 28, 2011 4:29 PM
Subject: Comments on ITR, 76 Fed. Reg. 34657

Thank you for this opportunity to comment. I urge the Fisheries Service to adopt the strictest mitigation measures possible to protect marine mammals in the Gulf of Mexico from harm caused by seismic exploration. The Fisheries Service should limit seismic exploration in the Gulf of Mexico, which can hurt whales and dolphins.

In particular, the Fisheries Service should prohibit seismic surveys in areas of high biological importance. Such areas include Mississippi Canyon, which is important habitat for the Gulf's small, biologically distinct population of sperm whales, and DeSoto Canyon, which also provides sperm whale habitat and is the area where Bryde's whales are most commonly seen in the Gulf. Seismic surveys in coastal areas should be restricted to protect bottlenose dolphins and manatees.

In addition to protecting sensitive habitats, the Fisheries Service should implement measures that will reduce the total amount of noise being introduced into the marine environment as much as possible. In particular, the Service should ensure that duplicative surveys are eliminated and develop a cumulative noise budget.

Glenda Denniston
3311 Lake Mendota Dr
Madison, WI 53705
US

From: "Hope Carr" <hopecarr@ix.netcom.com>
To: <ITP.Goldstein@noaa.gov>
Sent: Tuesday, June 28, 2011 2:32 PM
Subject: Comments on ITR, 76 Fed. Reg. 34657

I urge the adoption of the strictest mitigation measures possible to protect marine mammals in the Gulf of Mexico from harm caused by seismic exploration.

The Fisheries Service should limit seismic exploration in the Gulf of Mexico, particularly in areas of high biological importance. Such areas include Mississippi Canyon and DeSoto Canyon, as well as in coastal areas.

Efforts should be made to reduce the total noise being introduced into the marine environment as much as possible. Duplicate surveys should be eliminated under a cumulative noise budget.

Thank you for your consideration.

Hope Carr
358 85th Street
Brooklyn, NY 11209
US

From: "Jennifer Turner" <jturner00@gmail.com>
To: <ITP.Goldstein@noaa.gov>
Sent: Tuesday, June 28, 2011 3:33 PM
Subject: Comments on ITR, 76 Fed. Reg. 34657

Thank you for welcoming comments. I'm concerned about the welfare of marine mammals and urge the Fisheries Service to adopt the strictest measures to protect them and their habitat.

Jennifer Turner
2038 20th St SE
Puyallup, WA 98372
US

From: "Joy Schochet" <joysch@moose-mail.com>
To: <ITP.Goldstein@noaa.gov>
Sent: Thursday, June 30, 2011 1:11 AM
Subject: Comments on ITR, 76 Fed. Reg. 34657

Thank you for this opportunity to comment. I urge the Fisheries Service to adopt the strictest mitigation measures possible to protect marine mammals in the Gulf of Mexico from harm caused by seismic exploration. The Fisheries Service should limit seismic exploration in the Gulf of Mexico, which can hurt whales and dolphins.

Marine mammals are vital elements of marine ecosystems and as such need the utmost protection. So far, we have done a dismal job of conserving their habitats and preventing their degradation, with the consequence that the populations of many species are plummeting. We cannot afford to take the risk of disturbing the marine environment and these important animals. We need to concentrate on energy conservation, not disrupt the entire planet in our ceaseless and, ultimately, futile search for oil.

Please protect our marine ecosystems from untoward noises.

Joy Schochet
828 W. George
Chicago, IL 60657
US

From: "Judith Newman" <connexio@cybermesa.com>
To: <ITP.Goldstein@noaa.gov>
Sent: Wednesday, June 29, 2011 8:40 AM
Subject: Comments on ITR, 76 Fed. Reg. 34657

Thank you for this opportunity to comment. Please adopt the measures that will protect marine mammals in the Gulf of Mexico, particularly from seismic exploration in areas important to sperm whales (Mississippi Canyon and DeSoto Canyon) and Bryde's whales (DeSoto Canyon). Bottlenose dolphins and manatees need protection from seismic surveys in coastal areas.

In addition to protecting sensitive habitats, the Fisheries Service should implement measures that will reduce the total amount of noise being introduced into the marine environment as much as possible. In particular, the Service should ensure that duplicate surveys are eliminated and develop a cumulative noise budget.

Judith Newman
Alamo Drive
Santa Fe, NM 87501
US

From: "kathleen king" <kaking2@wisc.edu>
To: <ITP.Goldstein@noaa.gov>
Sent: Thursday, June 30, 2011 4:48 PM
Subject: Comments on ITR, 76 Fed. Reg. 34657

Thank you for this opportunity to comment. I urge the Fisheries Service to adopt the strictest mitigation measures possible to protect marine mammals in the Gulf of Mexico from harm caused by seismic exploration. The Fisheries Service should limit seismic exploration in the Gulf of Mexico, which can hurt whales and dolphins.

In particular, the Fisheries Service should prohibit seismic surveys in areas of high biological importance. Such areas include Mississippi Canyon, which is important habitat for the Gulf's small, biologically distinct population of sperm whales, and DeSoto Canyon, which also provides sperm whale habitat and is the area where Bryde's whales are most commonly seen in the Gulf. Seismic surveys in coastal areas should be restricted to protect bottlenose dolphins and manatees.

In addition to protecting sensitive habitats, the Fisheries Service should implement measures that will reduce the total amount of noise being introduced into the marine environment as much as possible. In particular, the Service should ensure that duplicative surveys are eliminated and develop a cumulative noise budget.

kathleen king
410 ozark trail
madison, WI 53705
US

From: "Leilani Horton" <lhorton@lib.nmsu.edu>
To: <ITP.Goldstein@noaa.gov>
Sent: Tuesday, June 28, 2011 5:22 PM
Subject: Comments on ITR, 76 Fed. Reg. 34657

I strongly urge the Fisheries Service to adopt, and enforce, the strictest mitigation measures possible to protect marine mammals in the Gulf of Mexico from harm caused by seismic exploration. The Fisheries Service should greatly limit seismic exploration in the Gulf of Mexico, exploration which can hurt whales and dolphins.

In particular, the Fisheries Service should prohibit seismic surveys in all areas of high biological importance. Examples: the areas of Mississippi Canyon and DeSoto Canyon. Seismic surveys in all coastal areas should be restricted to protect bottlenose dolphins and manatees.

Additionally, please implement measures to greatly reduce the total amount of noise being introduced into the marine environment, and eliminate it wherever possible. Example: please ensure that duplicative surveys are eliminated and develop a cumulative noise budget.

Leilani Horton
1300 Myrtle
Las Cruces, NM 88001
US

From: "Lynda Adams" <rainbow_starre@hotmail.com>
To: <ITP.Goldstein@noaa.gov>
Sent: Wednesday, June 29, 2011 3:09 AM
Subject: Comments on ITR, 76 Fed. Reg. 34657

If we do not protect these mammals Poseidon shall have revenge.

Lynda Adams
4 Vernon Road
Gladstone, ot 4680
AU

From: "Marsha Stanek" <mjstanek@wisc.edu>
To: <ITP.Goldstein@noaa.gov>
Sent: Tuesday, June 28, 2011 2:57 PM
Subject: Comments on ITR, 76 Fed. Reg. 34657

Thank you for this opportunity to comment. I urge the Fisheries Service to adopt the strictest mitigation measures possible to protect marine mammals in the Gulf of Mexico from harm caused by seismic exploration. The Fisheries Service should limit seismic exploration in the Gulf of Mexico, which can hurt whales and dolphins.

In particular, the Fisheries Service should prohibit seismic surveys in areas of high biological importance. Such areas include Mississippi Canyon, which is important habitat for the Gulf's small, biologically distinct population of sperm whales, and DeSoto Canyon, which also provides sperm whale habitat and is the area where Bryde's whales are most commonly seen in the Gulf. Seismic surveys in coastal areas should be restricted to protect bottlenose dolphins and manatees.

In addition to protecting sensitive habitats, the Fisheries Service should implement measures that will reduce the total amount of noise being introduced into the marine environment as much as possible. In particular, the Service should ensure that duplicative surveys are eliminated and develop a cumulative noise budget.

Marsha Stanek
469 Game Ridge Trail
Oregon, WI 53575
US

From: "Michael Berndt" <mberndt@excite.com>
To: <ITP.Goldstein@noaa.gov>
Sent: Wednesday, June 29, 2011 3:53 AM
Subject: Comments on ITR, 76 Fed. Reg. 34657

Thank you for this opportunity to comment. I urge the Fisheries Service to adopt the strictest mitigation measures possible to protect marine mammals in the Gulf of Mexico from harm caused by seismic exploration.

In particular, the Fisheries Service should prohibit seismic surveys in areas of high biological importance. Such areas include Mississippi Canyon and DeSoto Canyon, which provide sperm whale habitat and, in the latter location, habitat for Bryde's whales. Seismic surveys in coastal areas should be restricted to protect bottlenose dolphins and manatees as well.

In addition to protecting sensitive habitats, the Fisheries Service should implement measures that will reduce the total amount of noise being introduced into the marine environment as much as possible, ensuring that duplicative surveys are eliminated and developing a cumulative noise budget.

Michael Berndt
1224 S. Palmer
Bloomington, IN 47401
US

From: "Norman Higginson" <norm08@gmail.com>
To: <ITP.Goldstein@noaa.gov>
Sent: Tuesday, June 28, 2011 6:45 PM
Subject: Comments on ITR, 76 Fed. Reg. 34657

Thank you for this opportunity to comment. I urge the Fisheries Service to adopt the strictest mitigation measures possible to protect marine mammals in the Gulf of Mexico from harm caused by seismic exploration. The Fisheries Service should limit seismic exploration in the Gulf of Mexico, which can hurt whales and dolphins.

Norman Higginson
2885 Sanford Ave. SW #13777
Grandville, MI 49418
USA

From: "Paul Dindy" <paul.dindy@wellpoint.com>
To: <ITP.Goldstein@noaa.gov>
Sent: Tuesday, June 28, 2011 2:57 PM
Subject: Comments on ITR, 76 Fed. Reg. 34657

Thank you for this opportunity to comment. I urge the Fisheries Service to adopt the strictest mitigation measures possible to protect marine mammals in the Gulf of Mexico from harm caused by seismic exploration.

In particular, the Fisheries Service should prohibit seismic surveys in areas of high biological importance.

In addition to protecting sensitive habitats, the Fisheries Service should implement measures that will reduce the total amount of noise being introduced into the marine environment as much as possible. In particular, the Service should ensure that duplicative surveys are eliminated and develop a cumulative noise budget.

Paul Dindy
6 Leonard Pl
Foxboro, MA 02035
US

From: "R. Noteman" <rnoteman@yahoo.com>
To: <ITP.Goldstein@noaa.gov>
Sent: Tuesday, June 28, 2011 5:08 PM
Subject: Comments on ITR, 76 Fed. Reg. 34657

Thank you for this opportunity to comment. I urge the Fisheries Service to adopt the strictest mitigation measures possible to protect marine mammals in the Gulf of Mexico from harm caused by seismic exploration. The Fisheries Service should limit seismic exploration in the Gulf of Mexico, which can hurt whales and dolphins.

Fisheries Service should prohibit seismic surveys in areas of high biological importance.

In addition to protecting sensitive habitats, the Fisheries Service should implement measures that will reduce the total amount of noise being introduced into the marine environment as much as possible. In particular, the Service should ensure that duplicative surveys are eliminated and develop a cumulative noise budget.

R. Noteman
3875 Byers Road
Cumming, GA 30040
US

From: "Richard Bleam" <rbleam@bioscienceinc.com>
To: <ITP.Goldstein@noaa.gov>
Sent: Tuesday, June 28, 2011 3:09 PM
Subject: Comments on ITR, 76 Fed. Reg. 34657

Thank you for this opportunity to comment. I urge the Fisheries Service to adopt mitigation measures to protect marine mammals in the Gulf of Mexico from harm caused by seismic exploration. The Fisheries Service should limit seismic exploration in the Gulf of Mexico, which can hurt whales and dolphins.

In particular, the Fisheries Service should limit or prohibit seismic exploration in areas with high mammal populations especially at times of year critical to mammal reproduction, migration and feeding.

In addition to protecting sensitive habitats, the Fisheries Service should implement measures that will reduce the total amount of noise being introduced into the marine environment as much as possible. In particular, the Service should ensure that duplicative surveys are eliminated and develop a cumulative noise budget.

Richard Bleam
1025 Morgan Hill Road
Easton, PA 18042
US

From: "Susan Berta" <susan@orcanetwork.org>
To: <ITP.Goldstein@noaa.gov>
Sent: Tuesday, June 28, 2011 3:25 PM
Subject: Comments on ITR, 76 Fed. Reg. 34657

Thank you for this opportunity to comment. I urge the Fisheries Service to adopt the strictest mitigation measures possible to protect marine mammals in the Gulf of Mexico from harm caused by seismic exploration. The Fisheries Service should limit seismic exploration in the Gulf of Mexico, which can hurt whales and dolphins.

In particular, the Fisheries Service should prohibit seismic surveys in areas of high biological importance. Such areas include Mississippi Canyon, which is important habitat for the Gulf's small, biologically distinct population of sperm whales, and DeSoto Canyon, which also provides sperm whale habitat and is the area where Bryde's whales are most commonly seen in the Gulf. Seismic surveys in coastal areas should be restricted to protect bottlenose dolphins and manatees.

In addition to protecting sensitive habitats, the Fisheries Service should implement measures that will reduce the total amount of noise being introduced into the marine environment as much as possible. In particular, the Service should ensure that duplicative surveys are eliminated and develop a cumulative noise budget.

Susan Berta
2403 North Bluff Rd
Greenbank, WA 98253-9718
US

From: "Susan Horn" <susanich@earthlink.net>
To: <ITP.Goldstein@noaa.gov>
Sent: Tuesday, June 28, 2011 4:59 PM
Subject: Comments on ITR, 76 Fed. Reg. 34657

Thank you for this opportunity to comment. I strongly urge the Fisheries Service to STOP any and all exploration in the Gulf of Mexico. Especially since BP has yet to clean up it's mess, continues to dump toxic chemicals in the gulf to hide their failure. Toxins that are killing dolphins, turtles, manatees, coral reefs, shellfish and other species. Enough is enough. We are all connected in this web of life on our closed biosphere and the decimation of other species just adds yet another nail in the coffin of human life.

And the Fisheries Service must prohibit seismic surveys.

As other species die off, so does our opportunity to continue living on this planet. EVERYTHING IS INTERRELATED, and to kill off our fellow beings for nonrenewable resources is short-sighted, and lacks any and all common sense.

Susan Horn
1107 E Road to Six Flags
Arlington, TX 76011-5076
US

From: "Andy Baltensperger" <abaltens@alaska.edu>
To: <ITP.Goldstein@noaa.gov>
Sent: Tuesday, June 28, 2011 5:43 PM
Subject: Comments on ITR, 76 Fed. Reg. 34657

Thank you for this opportunity to comment. I urge the Fisheries Service to adopt the strictest mitigation measures possible to protect marine mammals in the Gulf of Mexico from harm caused by seismic exploration. The Fisheries Service should limit seismic exploration in the Gulf of Mexico, which can hurt whales and dolphins.

In particular, the Fisheries Service should prohibit seismic surveys in areas of high biological importance. Such areas include Mississippi Canyon, which is important habitat for the Gulf's small, biologically distinct population of sperm whales, and DeSoto Canyon, which also provides sperm whale habitat and is the area where Bryde's whales are most commonly seen in the Gulf. Seismic surveys in coastal areas should be restricted to protect bottlenose dolphins and manatees.

In addition to protecting sensitive habitats, the Fisheries Service should implement measures that will reduce the total amount of noise being introduced into the marine environment as much as possible. In particular, the Service should ensure that duplicative surveys are eliminated and develop a cumulative noise budget.

Andy Baltensperger
2641 Goldhill Rd.
Fairbanks, AK 99709
US

From: "Bobbie Flowers" <bobbie_flowers@hotmail.com>
To: <ITP.Goldstein@noaa.gov>
Sent: Wednesday, June 29, 2011 12:16 AM
Subject: Comments on ITR, 76 Fed. Reg. 34657

Thank you for this opportunity to comment. I urge the Fisheries Service to adopt the strictest mitigation measures possible to protect marine mammals in the Gulf of Mexico from harm caused by seismic exploration. The Fisheries Service should limit seismic exploration in the Gulf of Mexico, which can hurt whales and dolphins.

In addition to protecting sensitive habitats, the Fisheries Service should implement measures that will reduce the total amount of noise being introduced into the marine environment as much as possible. In particular, the Service should ensure that duplicative surveys are eliminated and develop a cumulative noise budget.

Bobbie Flowers
418 West 17th Street, Apt. 22A
New York, NY 10011-5826
US

From: "C. Knuth Fischer" <cknuth@aol.com>
To: <ITP.Goldstein@noaa.gov>
Sent: Tuesday, June 28, 2011 7:22 PM
Subject: Comments on ITR, 76 Fed. Reg. 34657

The Fisheries Service should prohibit seismic surveys in the Gulf of Mexico. Particular areas include the Mississippi Canyon, which is important habitat for the Gulf's biologically distinct population of sperm whales, and DeSoto Canyon, which is the area where Bryde's whales are most commonly seen in the Gulf. In coastal areas, seismic surveys should be restricted to protect bottlenose dolphins and manatees.

The Fisheries Service should also reduce the noise introduced into the marine environment by ensuring that duplicative surveys are eliminated and a cumulative noise budget developed.

C. Knuth Fischer
956 Conner Road
West Chester, PA 19380-1810
US

From: "Carole Tebay" <tebay@bellsouth.net>
To: <ITP.Goldstein@noaa.gov>
Sent: Tuesday, June 28, 2011 10:08 PM
Subject: Comments on ITR, 76 Fed. Reg. 34657

I'm writing in support of limiting seismic exploration in the Gulf of Mexico to protect whales and dolphins from the deafening noise which can affect their hearing, breeding, and feeding.

Carole Tebay
4525 River Ranch Road
Milton, FL 32583
US

From: "Dale Ramsey" <dramsey@mas.org>
To: <ITP.Goldstein@noaa.gov>
Sent: Thursday, June 30, 2011 9:56 AM
Subject: Comments on ITR, 76 Fed. Reg. 34657

I urge the Fisheries Service to adopt the strictest mitigation measures possible to protect marine mammals in the Gulf of Mexico from harm caused by seismic exploration. The Fisheries Service should prohibit seismic surveys in areas of high biological importance: Mississippi Canyon and DeSoto Canyon, especially. This seismic exploration in the Gulf of Mexico can harm whales and dolphins.

As much as possible, the Fisheries Service should take steps to REDUCE NOISE being introduced into the marine environment .

PLEASE ensure that duplicative surveys are eliminated and develop a cumulative noise budget.

Dale Ramsey
325 Riverside Dr. 134
New York, NY 10025
US

From: "Diana Goodman" <dianavestg@yahoo.com>
To: <ITP.Goldstein@noaa.gov>
Sent: Tuesday, June 28, 2011 2:37 PM
Subject: Comments on ITR, 76 Fed. Reg. 34657

Thank you for this opportunity to urge the Fisheries Service to adopt the strictest mitigation measures to protect marine mammals in the Gulf of Mexico from harm caused by seismic exploration. The Fisheries Service must limit seismic exploration in the Gulf of Mexico, which can hurt whales and dolphins.

The Fisheries Service must prohibit seismic surveys in areas of high biological importance including Mississippi Canyon and DeSoto Canyon, which are important habitats for sperm whales. The Gulf. Seismic surveys in coastal areas should be restricted to protect bottlenose dolphins and manatees.

In addition to protecting sensitive habitats, the Fisheries Service must implement measures that will reduce the total amount of noise introduced into the marine environment, particularly duplicative surveys.

Diana Goodman
123 Mendosa Ave
San Francisco, CA 94116-1944
US

From: "Duane Schat" <curly.schat@thomson.com>
To: <ITP.Goldstein@noaa.gov>
Sent: Tuesday, June 28, 2011 2:38 PM
Subject: Comments on ITR, 76 Fed. Reg. 34657

Thank you for this opportunity to comment. I urge the Fisheries Service to adopt the strictest mitigation measures possible to protect marine mammals in the Gulf of Mexico from harm caused by seismic exploration. The Fisheries Service should limit seismic exploration in the Gulf of Mexico, which can hurt whales and dolphins.

In particular, the Fisheries Service should prohibit seismic surveys in areas of high biological importance. Such areas include Mississippi Canyon, which is important habitat for the Gulf's small, biologically distinct population of sperm whales, and DeSoto Canyon, which also provides sperm whale habitat and is the area where Bryde's whales are most commonly seen in the Gulf. Seismic surveys in coastal areas should be restricted to protect bottlenose dolphins and manatees.

In addition to protecting sensitive habitats, the Fisheries Service should implement measures that will reduce the total amount of noise being introduced into the marine environment as much as possible. In particular, the Service should ensure that duplicative surveys are eliminated and develop a cumulative noise budget.

Duane Schat
7985 S Vincennes Way
Centennial, CO 80112
US

From: "Georgeanne Spates" <gspates@optonline.net>
To: <ITP.Goldstein@noaa.gov>
Sent: Tuesday, June 28, 2011 2:55 PM
Subject: Comments on ITR, 76 Fed. Reg. 34657

I am writing to urge the Fisheries Service to adopt the very strictest mitigation measures to protect marine mammals in the Gulf of Mexico from seismic exploration, especially in some of the Gulf's canyons and coastal areas. Besides protecting specific Gulf habitats, the Fisheries Service needs to reduce the total amount of underwater noise as much as possible and carefully avoid duplicative seismic surveys as well as develop any other measures that protect dolphins and whales from harmful oil exploration.

Thanks for your consideration of my comments.

Georgeanne Spates
Pob 786
Southold, NY 11971
US

From: "Helen Schietinger" <h.schietinger@verizon.net>
To: <ITP.Goldstein@noaa.gov>
Sent: Tuesday, June 28, 2011 2:38 PM
Subject: Comments on ITR, 76 Fed. Reg. 34657

Please do everything possible to protect marine mammals in the Gulf of Mexico from harm by seismic exploration, which can hurt whales and dolphins.

I urge the Fisheries Service to prohibit seismic surveys in areas of high biological importance, including Mississippi Canyon, an important habitat for sperm whales, and DeSoto Canyon, where Bryde's whales are seen most commonly in the Gulf. Seismic surveys in coastal areas should be restricted to protect bottlenose dolphins and manatees.

In addition, the Fisheries Service please implement measures to reduce the total amount of noise being introduced into the marine environment. In particular, the Service should eliminate duplicative surveys.

Helen Schietinger
1623 Kennedy Place, NW
Washington, DC 20011
US

From: "Jackie Feulner" <jihf@live.com>
To: <ITP.Goldstein@noaa.gov>
Sent: Tuesday, June 28, 2011 3:06 PM
Subject: Comments on ITR, 76 Fed. Reg. 34657

Thank you for this opportunity to comment. I implore you to put in place the strictest mitigation measures to protect manatees, whales and dolphins in the Gulf of Mexico from harm caused by seismic exploration. You should limint seismic exploration to protect these intelligent and important mamals.

You should prohibit seismic surveys in areas of high biological importance, including Mississippi Canyon, and DeSoto Canyonf. Seismic surveys in coastal areas should be restricted to protect bottlenose dolphins and manatees.

In addition to protecting sensitive habitats, the Fisheries Service should implement measures that will reduce the total amount of noise being introduced into the marine environment as much as possible. An easy step would be to ensure that duplicative surveys are eliminated and develop a cumulative noise budget.

Jackie Feulner
6038 Owens St.
Arvada, CO 80004
US

From: "Joan Bell-Kaul" <bellkaul@wisc.edu>
To: <ITP.Goldstein@noaa.gov>
Sent: Tuesday, June 28, 2011 2:54 PM
Subject: Comments on ITR, 76 Fed. Reg. 34657

Thank you for this opportunity to comment. I urge the Fisheries Service to adopt the strictest mitigation measures possible to protect marine mammals in the Gulf of Mexico from harm caused by seismic exploration. The Fisheries Service should limit seismic exploration in the Gulf of Mexico, which can hurt whales and dolphins.

In particular, the Fisheries Service should prohibit seismic surveys in areas of high biological importance. Such areas include Mississippi Canyon, which is important habitat for the Gulf's small, biologically distinct population of sperm whales, and DeSoto Canyon, which also provides sperm whale habitat and is the area where Bryde's whales are most commonly seen in the Gulf. Seismic surveys in coastal areas should be restricted to protect bottlenose dolphins and manatees.

In addition to protecting sensitive habitats, the Fisheries Service should implement measures that will reduce the total amount of noise being introduced into the marine environment as much as possible. In particular, the Service should ensure that duplicative surveys are eliminated and develop a cumulative noise budget. Once another species disappears, "you never get it back." Please, for once, prioritize LIFE over PROFITS; and you will be able to live with a clear conscience, knowing you did the right thing.

Joan Bell-Kaul
4225 Esch Lane
Madison, WI 53704
US

From: "Judith Fletcher" <jfletcher@riverdale.edu>
To: <ITP.Goldstein@noaa.gov>
Sent: Wednesday, June 29, 2011 7:55 AM
Subject: Comments on ITR, 76 Fed. Reg. 34657

I am writing to urge the Fisheries Service to adopt the strictest possible mitigation measures to protect marine mammals in the Gulf of Mexico from harm caused by seismic exploration.

Seismic surveys should be prohibited in areas which are of high biological importance, such as Mississippi and DeSoto Canyons

Reduction of the total amount of noise being introduced into the marine environment is also imperative.

Judith Fletcher
525 W. 238th St. Apt. A1
Bronx, NY 10463
US

From: "Kathleen Drury" <japaneselindsay@gmail.com>
To: <ITP.Goldstein@noaa.gov>
Sent: Tuesday, June 28, 2011 9:01 PM
Subject: Comments on ITR, 76 Fed. Reg. 34657

I strongly urge the Fisheries Service and BOEMRE to vigorously and strongly protect dolphins, whales and other marine mammals from harmful activities of oil exploration. To, in other words, comply with the Endagendered Species Act and Marine Mammal Protection Act. There must be a strong, scientifically-based permit process that must be followed and rules complied with. Strictly.

High-intensity sounds from seismic exploration are among the effects which need to be limited.

Kathleen Drury
7661 N. Sheridan Rd.
Chicago, IL 60626
US

From: "Lawrence Thompson" <thompson14ster@Gmail.com>
To: <ITP.Goldstein@noaa.gov>
Sent: Tuesday, June 28, 2011 11:09 PM
Subject: Comments on ITR, 76 Fed. Reg. 34657

I would like to see the Fisheries Service adopt the strictest mitigation measures possible to protect marine mammals in the Gulf of Mexico from harm caused by seismic activies. The Fisheries Service should LIMIT seismic exploration in the Gulf of Mexico, which can hurt whales and dolphins, by prohibiting seismic surveys in areas of high biological importance such as Mississippi Canyon and DeSoto Canyon. Seismic surveys in coastal areas should be restricted to protect bottlenose dolphins and manatees. Besides protecting sensitive habitats, the Fisheries Service should adopt measures that will reduce the TOTAL AMOUNT of noise being introduced into the marine environment as much as possible.

Lawrence Thompson
1069 Felicia Court
Livermore, CA 94550
US

From: "Liz Andrews" <zakszewski@wisc.edu>
To: <ITP.Goldstein@noaa.gov>
Sent: Tuesday, June 28, 2011 3:53 PM
Subject: Comments on ITR, 76 Fed. Reg. 34657

Thank you for this opportunity to comment. I urge the Fisheries Service to adopt the strictest mitigation measures possible to protect marine mammals in the Gulf of Mexico from harm caused by seismic exploration. The Fisheries Service should limit seismic exploration in the Gulf of Mexico, which can hurt whales and dolphins.

In particular, the Fisheries Service should prohibit seismic surveys in areas of high biological importance. Such areas include Mississippi Canyon, which is important habitat for the Gulf's small, biologically distinct population of sperm whales, and DeSoto Canyon, which also provides sperm whale habitat and is the area where Bryde's whales are most commonly seen in the Gulf. Seismic surveys in coastal areas should be restricted to protect bottlenose dolphins and manatees.

In addition to protecting sensitive habitats, the Fisheries Service should implement measures that will reduce the total amount of noise being introduced into the marine environment as much as possible. In particular, the Service should ensure that duplicative surveys are eliminated and develop a cumulative noise budget.

Liz Andrews
306 N Segoe Rd #28B
Madison, WI 53705
US

From: "Mark Smaby" <msmaby@comcast.net>
To: <ITP.Goldstein@noaa.gov>
Sent: Tuesday, June 28, 2011 10:29 PM
Subject: Comments on ITR, 76 Fed. Reg. 34657

Please adopt the strictest mitigation measures possible to protect marine mammals in the Gulf of Mexico from harm caused by seismic exploration. By limiting seismic exploration in the Gulf of Mexico, whales and dolphins will be much less exposed to harm.

In particular, the Fisheries Service should prohibit seismic surveys in areas of high biological importance in order to protect sperm whales, bottle-nose dolphins and manatees in areas such as Mississippi Canyon, DeSoto Canyon, and In coastal areas.

Your support of these critical actions will help these wonderful creatures survive! Thank you!

Mark Smaby
1917 Dixon Drive
Bloomington, MN 55431
US

From: "Mary Wellington" <mary@wellingtonfarm.com>
To: <ITP.Goldstein@noaa.gov>
Sent: Tuesday, June 28, 2011 8:30 PM
Subject: Comments on ITR, 76 Fed. Reg. 34657

Thank you for this opportunity to comment. I urge the Fisheries Service to adopt the strictest mitigation measures possible to protect marine mammals in the Gulf of Mexico from harm caused by seismic exploration. The Fisheries Service should limit seismic exploration in the Gulf of Mexico, which can hurt whales and dolphins.

Mary Wellington
8682 N. Morning View Dr.
Tucson, AZ 85704
US

From: "Mike Haines" <michaelhaines.ca@sbcglobal.net>
To: <ITP.Goldstein@noaa.gov>
Sent: Thursday, June 30, 2011 4:58 PM
Subject: Comments on ITR, 76 Fed. Reg. 34657

Please enact strong mitigation measuresto protect marine mammals in the Gulf of Mexico from harm caused by seismic exploration. The Fisheries Service should limit seismic exploration in the Gulf of Mexico, which can hurt whales and dolphins.

The Fisheries Service should prohibit seismic surveys in areas of high biological importance. The Fisheries Service should also establish measures that will reduce the total amount of noise being introduced into the marine environment.

Thank you.

Mike Haines
null null
san rafael, CA 94901
US

From: "Patrick Mears" <patrickamears@gmail.com>
To: <ITP.Goldstein@noaa.gov>
Sent: Tuesday, June 28, 2011 3:58 PM
Subject: Comments on ITR, 76 Fed. Reg. 34657

Mr. Payne,

I would first like to thank you for this opportunity to comment on this issue. As a person deeply interested in conservation and a BS in Marine Biology I understand some of the economic issues with limiting seismic exploration. However, I would like to urge the Fisheries Service to become more strict in requiring permits for seismic tests as well as prohibiting them during times when endangered and rare marine animals that could be affected by them, are in the area. Areas of high biological importance should also be avoided when using these techniques.

I would also like to suggest that more studies of these animals be conducted so that migration patterns are well known, and that the effect of these exploration techniques on those animals are better understood.

I also suggest that the Fisheries Service should help ensure that duplicate surveys that are not necessary do not occur. Not only is it wasteful, it is harmful to the mammals that inhabit the environment.

Again, thank you for the opportunity to comment
With Respect,

Patrick Mears
BS Marine Biology
University of Texas at Austin

Patrick Mears
1307 Laurel Glen Blvd
Leander, TX 78641
US

From: "Peter Whelan" <pete4trees@yahoo.com>
To: <ITP.Goldstein@noaa.gov>
Sent: Tuesday, June 28, 2011 3:17 PM
Subject: Comments on ITR, 76 Fed. Reg. 34657

Protect the ocean waters from oil drilling. Be a champion for Nature. Don't be a pawn or puppet of industry.

Peter Whelan
4265 Alma`
Palo Alto, CA 94306
US

From: "Randy Marlatt" <randy.marlatt@gmail.com>
To: <ITP.Goldstein@noaa.gov>
Sent: Tuesday, June 28, 2011 5:07 PM
Subject: Comments on ITR, 76 Fed. Reg. 34657

I ask the Fisheries Service to adopt the strictest measures possible to protect marine mammals in the Gulf of Mexico and coastal areas from harm caused by seismic exploration. Seismic exploration and noise has been proven to hurt whales, manatees and dolphins.
Thank you.

Randy Marlatt
505 W. Fir Ave.
Flagstaff, AZ 86001
US

From: "Sinan Dunlap" <sndunlap@yahoo.com>
To: <ITP.Goldstein@noaa.gov>
Sent: Wednesday, June 29, 2011 3:27 AM
Subject: Comments on ITR, 76 Fed. Reg. 34657

Thank you for this opportunity to comment. I urge the Fisheries Service to adopt mitigation measures to protect marine mammals in the Gulf of Mexico from harm caused by seismic exploration. The Fisheries Service should limit seismic exploration in the Gulf of Mexico, which can hurt whales and dolphins.

Sinan Dunlap
33620 Pintail Street
Woodland, CA 95695
US

From: "Susan Depner" <sdepner@sbcglobal.net>
To: <ITP.Goldstein@noaa.gov>
Sent: Tuesday, June 28, 2011 3:16 PM
Subject: Comments on ITR, 76 Fed. Reg. 34657

I am submitting comments on ITR, 76 Fed. Reg. 34657. I support the adoption by the Fisheries Service of the strictest mitigation measures possible in order to protect marine mammals in the Gulf of Mexico from harm caused by seismic exploration.

Seismic surveys using airguns cause great harm to marine mammals such as whales and dolphins. It has been documented that a single seismic survey causes endangered fin and humpback whales to stop vocalizing over an area that is tens of thousands of square nautical miles in size, and these whales need to vocalize in order to eat and to reproduce. The surveys have also been documented to cause baleen whales to abandon habitat over the same scale. Please adopt strong mitigation measures to protect our vulnerable marine mammals.

Susan Depner
229 S Yale Ave
Addison, IL 60101
US

From: "Tracy Schroepfer" <tschroepfer@wisc.edu>
To: <ITP.Goldstein@noaa.gov>
Sent: Thursday, June 30, 2011 9:52 PM
Subject: Comments on ITR, 76 Fed. Reg. 34657

Thank you for this opportunity to comment. I urge the Fisheries Service to adopt the strictest mitigation measures possible to protect marine mammals in the Gulf of Mexico from harm caused by seismic exploration. The Fisheries Service should limit seismic exploration in the Gulf of Mexico, which can hurt whales and dolphins.

In particular, the Fisheries Service should prohibit seismic surveys in areas of high biological importance. Such areas include Mississippi Canyon, which is important habitat for the Gulf's small, biologically distinct population of sperm whales, and DeSoto Canyon, which also provides sperm whale habitat and is the area where Bryde's whales are most commonly seen in the Gulf. Seismic surveys in coastal areas should be restricted to protect bottlenose dolphins and manatees.

In addition to protecting sensitive habitats, the Fisheries Service should implement measures that will reduce the total amount of noise being introduced into the marine environment as much as possible. In particular, the Service should ensure that duplicative surveys are eliminated and develop a cumulative noise budget.

Tracy Schroepfer
224 Shato Lane
Monona, WI 53716
US

Subject: Comments on ITR, 76 Fed. Reg. 34657
From: Joanne Wagner <jlwagner@wisc.edu>
Date: Fri, 01 Jul 2011 17:39:35 -0400 (EDT)
To: ITP.Goldstein@noaa.gov

Thank you for this opportunity to comment. I urge the Fisheries Service to adopt the strictest mitigation measures possible to protect marine mammals in the Gulf of Mexico from harm caused by seismic exploration. The Fisheries Service should limit seismic exploration in the Gulf of Mexico, which can hurt whales and dolphins.

In particular, the Fisheries Service should prohibit seismic surveys in areas of high biological importance. Such areas include Mississippi Canyon, which is important habitat for the Gulf's small, biologically distinct population of sperm whales, and DeSoto Canyon, which also provides sperm whale habitat and is the area where Bryde's whales are most commonly seen in the Gulf. Seismic surveys in coastal areas should be restricted to protect bottlenose dolphins and manatees.

In addition to protecting sensitive habitats, the Fisheries Service should implement measures that will reduce the total amount of noise being introduced into the marine environment as much as possible. In particular, the Service should ensure that duplicative surveys are eliminated and develop a cumulative noise budget.

Joanne Wagner
4601 Windigo Trail
Madison, WI 53711
US

Subject: Comments on ITR, 76 Fed. Reg. 34657
From: Emma Miniscalco <scottandemma@verizon.net>
Date: Fri, 01 Jul 2011 18:13:14 -0400 (EDT)
To: ITP.Goldstein@noaa.gov

I appreciate this opportunity to comment on what I see as a positive step from the National Marine Fisheries Service toward enforcing the Marine Mammal Protection Act. Issuing permits for seismic oil surveys in the Gulf of Mexico is a way to acknowledge the far-reaching impacts that ocean noise has been shown to have on acoustic-dependent whales and dolphins, and would take into account the real harm that can been done to marine mammal populations without any limitations on seismic exploration. It is my hope that a compromise can been found between these animals' protection and the use of the surveys, such as restricting their use along the coast and at times of year when marine mammals are most vulnerable, keeping them out of areas that have high biological importance, including the Mississippi and DeSoto canyons, and ensuring that surveys are not unnecessarily duplicated. My view is that these mitigation measures are balanced, sensible, and fair, and would address a matter of coexistence that is worthy of attention. Thank you for your consideration.
Sincerely,
Emma Miniscalco

Emma Miniscalco
658 Acker Street, N.E.
Washington, DC 20002
US

Subject: Comments on ITR, 76 Fed. Reg. 34657
From: Laura Ottoson <write.la@gmail.com>
Date: Sat, 02 Jul 2011 13:35:11 -0400 (EDT)
To: ITP.Goldstein@noaa.gov

I urge the Fisheries Service to adopt the strictest mitigation measures possible to protect marine mammals in the Gulf of Mexico from harm caused by seismic exploration. The Fisheries Service should limit seismic exploration in the Gulf of Mexico, which can hurt whales and dolphins.In particular, the Fisheries Service should prohibit seismic surveys in areas of high biological importance.

In addition to protecting sensitive habitats, the Fisheries Service should implement measures that will reduce the total amount of noise being introduced into the marine environment as much as possible. The Service should ensure that duplicative surveys are eliminated and develop a cumulative noise budget.

It is vital that we consider the individual and cumulative effects that our actions are having on ocean life.

Laura Ottoson
809 Joslyn St
Helena, MT 59601
US

Subject: Comments on ITR, 76 Fed. Reg. 34657
From: Linda Isbell <dlisbell500@att.net>
Date: Sat, 02 Jul 2011 19:14:12 -0400 (EDT)
To: ITP.Goldstein@noaa.gov

Thank you for giving me this opportunity to comment. I ask the Fisheries Service to adopt the strictest measures possible to protect all marine mammals in the Gulf of Mexico from harm caused by seismic exploration. The Fisheries Service should severely limit seismic exploration in the Gulf of Mexico, which can hurt whales and dolphins and other sea creatures.

In particular, the Fisheries Service should prohibit seismic surveys in areas of high biological importance. Such areas include Mississippi Canyon and DeSoto Canyon, both support habitat for the sperm whales, and is the area where Bryde's whales are most commonly seen in the Gulf. Seismic surveys in coastal areas should be restricted to protect bottlenose dolphins and manatees.

In addition to protecting these irreplaceable habitats, the Fisheries Service should take measures that will reduce the total amount of noise being introduced into the marine environment as much as possible. In particular, the Service should make sure that duplicative surveys are eliminated and develop a cumulative noise budget.

Linda Isbell
12019 Wesco Drive
Maryland Heights, MO 63043
US

Subject: Comments on ITR, 76 Fed. Reg. 34657
From: diana artemis <artemdi@yahoo.cm>
Date: Sat, 02 Jul 2011 22:58:03 -0400 (EDT)
To: ITP.Goldstein@noaa.gov

I ask the Fisheries Service to adopt the strictest mitigation measures possible to protect marine mammals in the Gulf of Mexico from harm caused by seismic exploration. The Fisheries Service should limit seismic exploration in the Gulf of Mexico, which can hurt whales and dolphins.

Specifically, the Fisheries Service should prohibit seismic surveys in areas of high biological importance., such as Mississippi Canyon and DeSoto Canyon, which are home to dolphins and whales. Seismic surveys in coastal areas should be restricted to protect bottlenose dolphins and manatees.

The Fisheries Service should implement measures that will reduce the total amount of noise being introduced into the marine environment as much as possible, ensuring that duplicative surveys are eliminated, and develop a cumulative noise budget.

diana artemis
2930 marshall st
falls church, VA 22042-1956
US

Subject: Comments on ITR, 76 Fed. Reg. 34657
From: Joanne Vinton <jmvinton@peak.org>
Date: Mon, 04 Jul 2011 21:01:56 -0400 (EDT)
To: ITP.Goldstein@noaa.gov

NMFS should prohibit seismic surveys in areas of high biological importance, including Mississippi Canyon, DeSoto Canyon, and coastal areas.

NMFS should also implement measures that will reduce the total amount of noise being introduced into the marine environment as much as possible. In particular, the Service should ensure that duplicative surveys are eliminated and develop a cumulative noise budget.

Please require mitigation measures through the permit process -- such as seasonal limitations on seismic surveys during times of the year when vulnerable species are present.

Joanne Vinton
1206 48th Street
Sacramento, CA 95819
US

Subject: Comments on ITR, 76 Fed. Reg. 34657
From: Kathleen Sanders <katsanders03@yahoo.com>
Date: Tue, 05 Jul 2011 13:57:17 -0400 (EDT)
To: ITP.Goldstein@noaa.gov

Ear Sirs,

Regarding ITR, 76 Fed. Reg. 34657:

While I feel that exploration for oil is important, the Gulf Of Mexico is a fragile ecosystem under much stress and exploitation. I believe that the Fisheries Service must limit seismic exploration in the Gulf of Mexico, which can hurt whales, manatees, and dolphins, specifically in the DeSoto Canyon and the Mississippi Canyon. These populations have been harmed by the recent oil spills and need protections. I strongly believe that protecting these animals is vital to the health of our ecosystems and natural heritage.

Respectfully Yours,

Kathleen Sanders

Kathleen Sanders
310 Redwood Rd
San Anselmo, CA 94960
US

Subject: Comments on ITR, 76 Fed. Reg. 34657
From: cl barton <cb_inthecity@hotmail.com>
Date: Tue, 05 Jul 2011 20:57:49 -0400 (EDT)
To: ITP.Goldstein@noaa.gov

Thank you for this opportunity to comment. I urge the Fisheries Service to adopt the strictest mitigation measures possible to protect marine mammals in the Gulf of Mexico from harm caused by seismic exploration. The Fisheries Service should limit seismic exploration in the Gulf of Mexico, which can hurt whales and dolphins.

For God's sake, stop this. This is just wrong. PLAIN WRONG. Stop trying to deafen and destroy all the living things in the ocean in an effort to protect us and help some idiot contractor make a lot of money. Just stand next to a car with a throbbing stereo system and then magnify it by a thousand. That's what these sonic blasts do. If you can't stand it, they can't either. It's just another example of bioterrorism. Just use friggin' sonar and be done with it.

cl barton
2820 napoleon
new orleans, LA 70115
US

Subject: Comments on ITR, 76 Fed. Reg. 34657
From: Ellen Sweeney <ellen.sweeney@comcast.net>
Date: Mon, 11 Jul 2011 19:28:39 -0400 (EDT)
To: ITP.Goldstein@noaa.gov

Thank you for this opportunity to comment. I urge the Fisheries Service to adopt the strictest mitigation measures possible to protect marine mammals in the Gulf of Mexico from harm caused by seismic exploration. In particular, the Service should ensure that duplicative surveys are eliminated and develop a cumulative noise budget.

Whales, dolphins and other marinbe mammels have done us no harm, and yet we continue to kill and injure them for our own selfish purposes. Our oil addiction is getting completely out of hand. Please stop this insanity now. Thank you.

Ellen Sweeney
347 Massol Ave #608
Los Gatos, CA 95030-7236
US

Subject: Comments on ITR, 76 Fed. Reg. 34657
From: melissa winters <melissa1wine@yahoo.com>
Date: Mon, 11 Jul 2011 21:17:22 -0400 (EDT)
To: ITP.Goldstein@noaa.gov

PLease do everything you can to protect marine mammals from oil industry in the Gulf. Do not allow seismic surveys to occur.

melissa winters
70 main st
greenfield, MA 01301
US

Subject: Comments on ITR, 76 Fed. Reg. 34657
From: David Davidson <dmd@csdavidson.com>
Date: Mon, 11 Jul 2011 21:53:15 -0400 (EDT)
To: ITP.Goldstein@noaa.gov

Thank you for this opportunity to comment.

I urge the Fisheries Service to strictly limit seismic exploration in the Gulf of Mexico, which can hurt whales and dolphins, to protect marine mammals in the Gulf of Mexico from harm caused by seismic exploration.

Specifically, the Fisheries Service should prohibit seismic surveys in areas of high biological importance, including the Mississippi Canyon (important habitat for the Gulf's small, biologically distinct population of sperm whales) and DeSoto Canyon (the area where Bryde's whales are most commonly seen in the Gulf).

Seismic surveys in coastal areas should be restricted to protect bottlenose dolphins and manatees.

The Fisheries Service should also implement measures that will reduce the total amount of noise being introduced into the marine environment as much as possible by eliminating duplicative surveys and developing a cumulative noise budget.

Again, thank you for the opportunity to express my views.

David Davidson
7633 Loucks St
York, PA 17403
US

Subject: Comments on ITR, 76 Fed. Reg. 34657
From: Milton McKinney <miltonmckinney@aol.com>
Date: Mon, 11 Jul 2011 21:53:51 -0400 (EDT)
To: ITP.Goldstein@noaa.gov

Thank you for this opportunity to comment. I urge the Fisheries Service to stay out of this issue altogether. There is enough government interference in our lives without adding even more. There has never been a single government agency that ever took on a task and fulfilled it better, cheaper, or more efficiently than a private interest.

We should be concentrating our efforts on stopping whaling by those nations that still allow it, and the taking of dolphins for food by some nations. Seismic surveys are the least of our worries. If the whales and dolphins are killed off, then what is the good of restricting seismic surveys??? This is a typical play for power by a leftist "environmental" organization that just wants to be able to brag they made the "evil oil companies" do their bidding. Ignore them and concentrate on saving the whales and dolphins that are being killed daily. That is where our emphasis should be placed.

Milton McKinney
1200 Baker Street
Houston, TX 77002
US

Subject: Comments on ITR, 76 Fed. Reg. 34657
From: Ricardo Matos <matos.ricardo@gmail.com>
Date: Tue, 12 Jul 2011 04:59:21 -0400 (EDT)
To: ITP.Goldstein@noaa.gov

Good Morning,

Fortunately i can start this "letter" this way... if i was constantly under sounds of 250 decibels or more, probably i wouldn't even be able to write you!

My values, my social behavior and my personal beliefs oblige me to ask you to stop with this criminal acts!

In a time we are all facing the climate changes and its consequences among humans, fauna and flora, your main concern is still money and profit, no matter what it takes!

I really want to trust you still haven't lost all your sense... so, PLEASE, stop destroying OUR Planet!

If you don't care about you or a entire world population, think about you children, your grandchildren, your family...

With my best regards,

Ricardo Matos from Portugal.

Ricardo Matos
Rua da Macinhata, N°5
Santa Comba Dão, ot 3440-005
PT

Subject: Federal Register Volume 76, Number 114
From: Theresa Bobko <allamess2002@yahoo.com>
Date: Tue, 12 Jul 2011 07:50:37 -0700 (PDT)
To: "ITP.Goldstein@noaa.gov" <ITP.Goldstein@noaa.gov>

Oil and gas companies using seismic surveys to find underwater sources, involving blasts of high-powered air guns, which can exceed 250 decibels, naturally impact all ocean life, but of specific concern is the hearing loss in marine mammals. Remember, these magnificent creatures rely on sound for food, mating, and survival. I perceive these actions as harrasment and being in violation of the Marine Mammal Protection Act. This is my public comment to stop this. Thank you for your attention.

Theresa Bobko
Camden, Delaware

Subject: Fwd: Comments on ITR, 76 Fed. Reg. 34657
From: NMFS.PR1Comments@noaa.gov
Date: Tue, 12 Jul 2011 13:50:10 -0400
To: Howard.Goldstein@noaa.gov

FYI from the PR1 Comments Line

Comments on ITR, 76 Fed. Reg. 34657.eml

Subject: Comments on ITR, 76 Fed. Reg. 34657
From: Ravi <ravigloom@rediffmail.com>
Date: Tue, 12 Jul 2011 15:52:13 +0000
To: "NMFS.Pr1Comments@noaa.gov" <NMFS.PR1Comments@noaa.gov>

The Fisheries Service should limit seismic exploration in the Gulf of Mexico and execute the strictest mitigation measures possible to protect marine mammals in the Gulf of Mexico from harm caused by seismic exploration..

Areas that need extra protection include Mississippi Canyon, DeSoto Canyon, as well as coastal areas.

In addition to protecting sensitive habitats, the Fisheries Service should implement measures that will reduce the total amount of noise being introduced into the marine environment as much as possible. In particular, the Service should ensure that duplicative surveys are eliminated and develop a cumulative noise budget.

Thank you,
Ravi Grover
POB 802103
Chicago IL 60680-2103

=?utf-8?B?Q29tbWVudHMgb24gSVRSLCA3NiBGZWQuIFJlZy4gMzQ2NTc=?=.eml

Subject: Comments on ITR, 76 Fed. Reg. 34657
From: Cathrynn Healy <cathrynn.healy@hotail.com>
Date: Tue, 12 Jul 2011 23:12:18 -0400 (EDT)
To: ITP.Goldstein@noaa.gov

To Whom ever this may concern,

I understand that oil is necessary for the continuing advancements in this modern era, however, I urge that we must not forget that we are sharing this planet with other species, other lives.

We are a self centered species and we tend to not realize how much we have changed in order for us to become a materialized society and it is sad that other animals should suffer because of our fatal flaw.

The sea is a balanced system; as are rain forests, other ecosystems and our own social hierarchy. To pose a threat to one aspect, poses threats to the rest that rely on that one aspect and this chain of events should be considered since it may ultimately effect us in the future.
For example; if the marine mammals and other aquatic species in that one area were to be destroyed, their predators would die out, their prey would suddenly overpopulate and then they themselves die out because their prey died from over predation. In the end, that one area could become barren and lifeless which could spread like a disease through the rest of the surrounding area instead of just affecting one small place in an otherwise huge expanse. What would happen to the fishing in those areas affected? What are the other negative effects that should not be overlooked? I am asking these question and I am also seeing no answers or any evidence that the aspects surrounding the effects on the ecosystem have been considered.

I protest strongly to the high-intensity pulses for both the negative effects on the marine life and also to the long-term effects that may become problematic to ourselves. as well as to a larger area surrounding the initial dilemmas.

Thank you for reading this e-mail and I hope that the matter will be reconsidered without an overlook on the long-terms effects as well as an over look on the value of life for all species, not just our own.

Cathrynn Healy
greenleaf view
singapore, ot 279250
SG

Subject: Comments on ITR, 76 Fed. Reg. 34657
From: Kate Cleland-Sipfle <sipfle@aol.com>
Date: Fri, 15 Jul 2011 00:39:25 -0400 (EDT)
To: ITP.Goldstein@noaa.gov

After the great oil spill of 2010, a major setback for marine species and habitat, I cannot imagine widespread public support for seismic exploration in the Gulf of Mexico, due to the harm it can inflict on whales and dolphins.

Consider the species rich Mississippi Canyon and DeSoto Canyon, which provide sperm whale habitat, as well as the coastal areas where bottlenose dolphins and manatees live. These areas should be protected from seismic exploration at all cost.

Kate Cleland-Sipfle
811 Palmer Rd.
Ashland, OR 97520
US

Subject: FW: Request for comments
From: "Sokolowski, Roy T CIV COMPACFLT, N01CE1RS" <roy.sokolowski@navy.mil>
Date: Wed, 06 Jul 2011 14:57:09 -1000
To: ITP.Goldstein@noaa.gov

-----Original Message-----
From: Sokolowski, Roy T CIV COMPACFLT, N01CE1RS
Sent: Wednesday, July 06, 2011 14:54
To: IPT.Goldstein@NOAA.gov
Subject: FW: Request for comments

-----Original Message-----
From: Sokolowski, Roy T CIV COMPACFLT, N01CE1RS
Sent: Wednesday, July 06, 2011 14:53
To: ITP.Goldstien@noaa.gov
Subject: Request for comments

Comment #1. Why are the level A and Level B take criteria different for various applications? The U.S. Navy training and testing harassment and injury criteria is different from the criteria used for other agencies and in this request. Having differing harassment and injury criteria for different agencies or applicants is arbitrary and capricious. NMFS/NOAA should have standard criteria for harassment and injury for impulsive and non-impulsive sound sources that are applicable equally for all applicants. This criteria should be published by NMFS/NOAA so that when an applicant is modeling for acoustic (non-impulsive) and explosive (impulsive) effects for an activity that the most up to date NMFS/NOAA accepted criteria is readily available in order to conduct the effects analysis.

Comment #2. Why are sea turtles not included in the analysis?

Comment #3. Why are manatees not included in the analysis?

Thank you.

Roy Sokolowski
Waialua, Hawaii

7/11/2011

P. Michael Payne, Chief
Permits, Conservation, and Education Division
Office of Protected Resources, NMFS
1315 East-West Highway
Silver Spring, MD 20910-3225

Dear Mr. Payne,

I am interested in the situation presented by the Oceanic Preservation Society with regard to the seismic surveys performed in the Gulf of Mexico. It is my understanding that this activity causes harm, in the form of hearing loss, to the marine creatures residing offshore in this direct area. I would like to believe that once this practice is shown to be injurious and inhumane, we will cease all activity of this nature. Please direct me to the person(s) to whom I should direct my concerns.

With Hope,

Andrejia Brunett-Libecap
937-694-4867
andrejia@hotmail.com

Hilton
Waikoloa Village

RECEIVED
07-14-11
PRI

4986 Field ST
San Diego
Ca 92110

Dear P. Michael Payne, Chief.

I was shocked to learn that the government is violating the MMPA (Marine Mammal Protection act) if you continue to allow oil & gas companies use seismic surveys to find undersea ater sources - such this process involves blasts of high-powered air guns, which can exceed 250 decibels. (a vacuum cleaner measures around

USA

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80 dB, from 100 ft in a rock concert can be 110 dB, a jet at takeoff averages 120-140 dB) so this impacts all ocean life, but of specific concern is for hearing loss in marine mammals.

Remember, these magnificent creatures rely on sound to find food, mating and survival.

So please no seismic surveys!

I would be most grateful and would appreciate a kind reply.

Sincerely

Paula A. Richards
16830 Ventura Blvd. Suite 400
Encino, CA 91436

July 11, 2011

P. Michael Payne, Chief
Permits, Conservation, and Education Division
Office of Protected Resources, NMFS
1315 East-West Highway
Silver Spring, MD 20910-3225

Dear Chief Payne,

I am a follower of Oceanic and the work and information they provide about out oceans and events. I am writing you this letter today as I am concerned about the seismic surveys in the Gulf of Mexico.

This issue is near and dear to us all as it involves whales and dolphins.

As I understand it oil and gas companies use seismic surveys to find underwater sources, but the process involves blasts of high-powered air guns, which can exceed 250 decibels. (A vacuum cleaner measures around 80 dB, front row at a rock concert can be 110 dB and a jet at takeoff averages 120-140 dB).

Naturally this impacts all ocean life, but of specific concern is the hearing loss in marine mammals. These magnificent creatures rely on sound for food, mating, and their survival.

So, I am respectfully writing this letter to you today in hopes that you will consider the consequences and the ramifications this may have on the marine life in the Gulf of Mexico, and possibly further.

Thank you

Sincerely,

Paula A. Richards

P. Michael Payne, Chief
Permits, Conservation, and Education Division
Office of Protected Resources, NMFS
1315 East-West Highway
Silver Spring, MD 20910-3225

June 30, 2011

Dear Mr. Payne:

I would like to strongly urge the Fisheries Service to adopt the strictest mitigation measures possible to protect marine mammals in the Gulf of Mexico from potential harm caused by seismic exploration. I hope that the Fisheries Service would limit seismic exploration in the Gulf of Mexico, which can cause potentially serious injuries to whales and dolphins.

Specifically, the Fisheries Service could prohibit seismic surveys in areas of high biological importance. Such areas include Mississippi Canyon, which is important habitat for the Gulf's small, biologically distinct population of sperm whales, and DeSoto Canyon, which also provides sperm whale habitat and is the area where Bryde's whales are most commonly seen in the Gulf. Seismic surveys in coastal areas should be restricted to help protect bottlenose dolphins and manatees.

In addition to protecting sensitive habitats, the Fisheries Service should implement measures that will reduce the total amount of noise being introduced into the marine environment as much as possible. In particular, the Service should ensure that duplicative surveys are eliminated and develop a cumulative noise budget.

I would like to express my thanks for this opportunity to share my thoughts regarding this issue.

Good Health – Long Life,

David Lee Marshall

David Lee Marshall
343 Faculty Road
Duncannon, PA 17020

Subject -
Comments on ITR -
76-Fed-34637

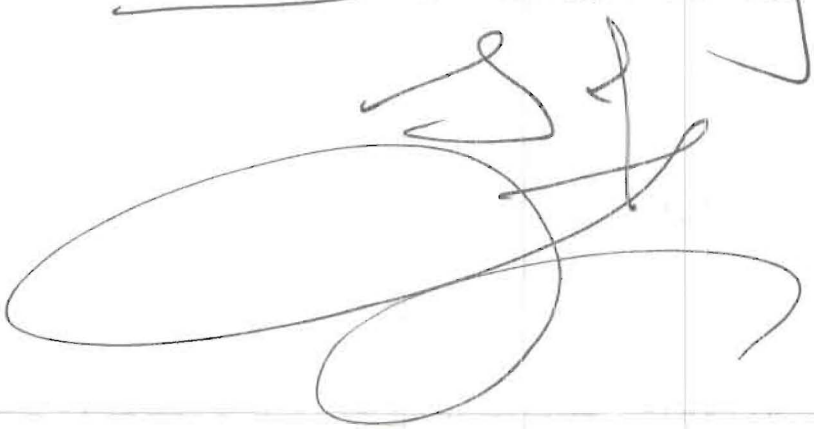
Ms. Irene Lopez
4986 Field ST
San Diego
Ca 92110

Dear P. Michael Payne - Chief.

I urge the Fisheries Service to adopt the strictest mitigation measures possible to protect marine mammals in the Gulf of Mexico from harm caused by seismic exploration - the Fisheries Service should limit seismic exploration in the Gulf of Mexico, which can and does hunt and whales and dolphens - In particular the Fisheries Service should prohibit seismic surveys in areas of high biological importance - I would be most grateful

and would appreciate a kind reply.

Sincerely



manatt
manatt | phelps | phillips

Craig A. Moyer
Manatt, Phelps & Phillips, LLP
Direct Dial: (310) 312-4353
E-mail: cmoyer@manatt.com

July 14, 2011

BY E-MAIL ITP.GOLDSTEIN@NOAA.GOV

P. Michael Payne
Chief, Permits, Conservation, and Education Division, Office of Protected Resources
National Marine Fisheries Service
1315 East-West Highway
Silver Spring, MD 20910-3225

Re: Comments on BOEMRE's revised application

Dear Mr. Payne:

Manatt, Phelps & Phillips on behalf of Liquid Robotics, Inc. (Liquid Robotics) provides these comments on the Bureau of Ocean Energy Management, Regulation, and Enforcement (BOEMRE) request for the development and implementation of regulations governing the incidental taking of marine mammals and on BOEMRE's revised application (Request). Liquid Robotics supports the Request insofar as BOEMRE encourages participation in passive acoustic monitoring programs as a means to reduce effects of acoustic surveys on marine mammals and other aquatic life.

Liquid Robotics is the designer and manufacturer of the Wave Glider®, an autonomous, wave-powered unmanned surface vehicle. To the extent that seismic surveys are needed to develop oil and gas reserves in the Outer Continental Shelf, exciting new developments in passive acoustic monitoring may provide opportunities to reduce the adverse impact of these seismic activities and, importantly, to reduce the take of marine mammals. Liquid Robotics can assist in the advancement of passive acoustic monitoring.

Accordingly, Liquid Robotics looks forward to working with all the other stakeholders to make the advances necessary to ensure passive acoustic monitoring is adequately considered as a potentially viable and generally available way of effecting the least practicable adverse impact of seismic activities. Please provide me with notice of all future opportunities to participate in this important rulemaking and related activities of the National Marine Fisheries Service.

Respectfully submitted,

Craig A. Moyer
Manatt, Phelps & Phillips, LLP

Subject: Response from Lamont-Doherty Earth Observatory and National Science Foundation
From: "Smith, Holly E." <hesmith@nsf.gov>
Date: Thu, 14 Jul 2011 16:03:40 -0400
To: ITP.Goldstein@noaa.gov
CC: Maya Tolstoy <tolstoy@ldeo.columbia.edu>, Helene Carton <hcarton@ldeo.columbia.edu>, Sean Higgins <sean@ldeo.columbia.edu>, Meagan Cummings <cummings@ldeo.columbia.edu>, "Houtman, Bauke H." <bhoutman@nsf.gov>, "Lee, Olivia" <olee@nsf.gov>, "Smith, Holly E." <hesmith@nsf.gov>, Howard Goldstein <Howard.Goldstein@noaa.gov>

The Lamont-Doherty Earth Observatory of Columbia University and the National Science Foundation provide the following comments in response to the Federal Register notice regarding the BOEMRE "Request to National Oceanic and Atmospheric Administration (NOAA) for Incidental Take regulations governing Seismic Surveys on the Outer Continental Shelf (OCS) of the Gulf of Mexico (GOM) (A response to Subpart I — MMPA Request Requirements at 50 CFR §216.104)". This document discusses the R/V Langseth and R/V Ewing calibration activities in Appendix A, Subchapter 2.4.6.

The purpose of Tolstoy et al. (2004 and 2009) and Diebold et al. (2010) papers was to present analyses for calibration data of the R/V Ewing and R/V Langseth seismic sources that were collected in 2003, 2007 and 2008 in the Gulf of Mexico in deep, shallow and intermediate water depths. Unfortunately, the BOEMRE document does not reflect the more recent Diebold et al. (2010) publication, which presents in greater detail some aspects of the R/V Langseth calibration efforts (especially for the site with sloped seafloor) and conclusions that include verification of appropriateness of current acoustic modeling efforts; discussion of the importance of seafloor physical and topographic features in influencing acoustic propagation; and, that incorporation of sound velocity profiles may enhance model results. The Diebold et al. (2010) publication may have been released after the majority of the BOEMRE effort was completed. We recommend however that BOEMRE review and consider the Diebold et al. (2010) publication, which provides further insights into the R/V Langseth calibration efforts and conclusions. We also note that the azimuthal variation for the four-string array discussed in Tolstoy et al. (2009) is not very significant, contrary to what was suggested in the BOEMRE document, but does become more significant for the two-string array as discussed in detail in Diebold et al. (2010). We agree with the BOEMRE statement that the approach used in these papers is 'conservative' as we have always maintained that employing this conservative approach may potentially enhance protection of marine mammals. We agree with the BOEMRE document that measured or modeled acoustic levels obtained for one particular source volume and configuration are valid for that particular source only, and that using those available values to derive acoustic levels for other sources may require either simple or more complex adjustments.

The BOEMRE can contact LDEO and NSF for further clarification or discussion on these matters.

Diebold, J. B., M. Tolstoy, L. Doermann, S. L. Nooner, S. C. Webb, and T. J. Crone (2010), R/V Marcus G. Langseth seismic source: Modeling and calibration, Geochem. Geophys.

Geosyst., 11, Q12012, doi:10.1029/2010GC003216.
Tolstoy, M., J. Diebold, L. Doermann, S. Nooner, S. C. Webb, D. R. Bohnenstiehl, T. J. Crone, and R. C. Holmes (2009), Broadband calibration of the R/V Marcus G. Langseth four-string seismic sources, Geochem. Geophys. Geosyst., 10, Q08011, doi:10.1029/2009GC002451.
Tolstoy, M., J. B. Diebold, S. C. Webb, D. R. Bohnenstiehl, E. Chapp, R. C. Holmes, and M. Rawson (2004), Broadband calibration of R/V Ewing seismic sources, Geophys. Res. Lett., 31, L14310, doi:10.1029/2004GL020234.

NRDC
THE EARTH'S BEST DEFENSE

NATURAL RESOURCES DEFENSE COUNCIL

By Electronic and Priority Mail

July 14, 2011

Mr. P. Michael Payne
Chief, Permits, Conservation, and Education Division
Office of Protected Resources
National Marine Fisheries Service
1315 East-West Highway
Silver Spring, MD 20910-3225
ITP.Goldstein@noaa.gov

Re: *Receipt of MMPA Incidental Take Application for Oil and Gas Geological and Geophysical Activities in the Gulf of Mexico*

Dear Mr. Payne:

On behalf of the Center for Biological Diversity, Earthjustice, Gulf Restoration Network, Natural Resources Defense Council, and the Sierra Club, and of our millions of members nationwide, I am writing to submit comments on NMFS' receipt of an incidental take application covering geological and geophysical exploration activities in the Gulf of Mexico. 76 Fed. Reg. 34656, 34656-34658 (June 14, 2011).

As you know, we are profoundly concerned about the impact of industry's high-intensity seismic exploration activity on the Gulf's marine mammals. Increasingly, the available science indicates that seismic airguns disrupt baleen whale behavior and impair their communication on a vast scale; that they harm a diverse range of other marine mammals in multiple ways; and that they significantly impact fish and fisheries, with unknown but potentially substantial effects on both coastal communities and marine mammal populations. The amount of seismic activity under consideration in this rulemaking is enormous, comprising dozens of surveys each year in what is the most intensively prospected body of water in the world. To make matters worse, all of these surveys are taking place in a context of chronic industrial noise: noise from the industry's support vessels, from its construction of offshore facilities, from its routine operations, and from its platform decommissioning. Moreover, many of the marine mammal populations that seismic operators are affecting—Bryde's whales, sperm whales, and bottlenose dolphins, among others—may already be seriously compromised by the *Deepwater Horizon* spill.

Given the sheer extent of activity in the Gulf, the substantial scientific concern about both seismic surveys and cumulative acoustic stressors, and the acute vulnerability of

Gulf populations, particularly in the wake of the *Deepwater* spill, it is vitally important that NMFS approach this rulemaking, and its associated environmental impact statement ("EIS"), carefully and conservatively. As you know, both NMFS and the federal courts have already recognized the spill as a significant event. For its part, the agency has re-initiated consultation under the Endangered Species Act in order to evaluate the effects of the spill on the Gulf shrimp fishery. Similarly, a federal judge recently found that NMFS violated the ESA when it failed to re-initiate consultation to determine the effect of the spill on a reef fish fishery that kills sea turtles. *Sea Turtle Conservancy et al. v. Locke*, No. 1:09-cv-00259 (N.D. Fla., July 5, 2011).

Unfortunately, BOEMRE's application, while benefiting from a more rigorous modeling effort than was attempted in the past, contains a number of major flaws that require NMFS' redress. The application adopts a single flat threshold for all species that assumes, insupportably, that take will not occur below 160 dB (RMS); it fails to account for cumulative impacts in any way; and it does not suggest any mitigation beyond the plainly inadequate safety zone monitoring and ramp-up that BOEMRE currently prescribes in the Gulf. NMFS must drastically improve this impact analysis, and, if a rule is to issue, must prescribe mitigation that reduces takes below the "small numbers" and "negligible impact" threshold, as the MMPA demands.[1] 16 U.S.C. § 1371(a)(5)(A)(i). Simply put, *current levels of seismic exploration in the northern Gulf of Mexico are not compatible with the MMPA.*

Our groups urge NMFS to take the following actions (discussed in further detail below), which we believe are required for compliance with applicable laws:

Recommendations for Impact Assessment

(1) Thoroughly revise the thresholds that BOEMRE uses in its application to estimate sublethal behavioral take from airgun surveys, using species-specific thresholds for sperm whales, beaked whales, and certain other species; including masking effects in thresholds, especially for Bryde's whales; ensuring that the thresholds used address take at received levels well below 160 dB (RMS); treating airguns as a mixed acoustic source behaving as both a multi-pulse source and a continuous noise source, depending on distance; and soliciting expert opinion in an open and transparent manner.

(2) Properly model for both temporary *and* permanent threshold shift and other debilitating injuries, taking into account recent data that indicates higher risk of hearing loss in marine mammals than previously suggested.

(3) Closely scrutinize BOEMRE's assumption of 230 dB (RMS) as a "typical" source level for airgun surveys, obtaining data indicating the source levels of

[1] The MMPA also requires NMFS to prescribe mitigation that achieves "the least practicable impact" on marine mammals, but this is a separate mandate. 16 U.S.C. § 1371(a)(5)(A)(i)(II)(aa). The "small numbers" and "negligible impact" standards must be met for the rule to issue at all, and therefore are not limited by considerations of practicability.

seismic arrays used over a representative period in the Gulf and determining if the use of this source level results in an undercount of take.

(4) Meaningfully analyze the cumulative impacts of sublethal takes, adopting the conservative assumption that any substantial decrements in the communication range of Bryde's whales or the foraging success of sperm whales caused by seismic surveys will result in adverse, population-level impacts.

(5) Consider the impacts of other activities and events in NMFS' impacts analysis, determining in particular whether the *Deepwater Horizon* spill establishes new baselines for population abundance and prey availability and for the capacity of certain species to withstand additional stressors.

(6) Conduct additional research to determine the stock delineation of Gulf Bryde's whales, and proceed on the assumption that Bryde's whales constitute a distinct stock if tissue samples needed to make such a determination are not available.

Recommendations for Mitigation

(1) Adopt area closures and restrictions for high-value habitat, including the Mississippi Canyon, DeSoto Canyon, coastal waters landward of the 20-meter isobath, and sperm whale habitat west of the Tortugas, and consider other areas based on the findings of the NOAA Working Group on Marine Mammal Hotspots.

(2) Establish activity caps, by (1) considering multiple alternatives for reducing cumulative exposures (well below 160 dB) in each planning region to levels that satisfy both the "small numbers" and "lowest practicable level" requirements; and (2) by assigning seasonal or year-round caps that significantly reduce exposures for Bryde's and sperm whales, to address the clear potential for greater than negligible impacts on these species.

(3) Require BOEMRE to eliminate unnecessary duplication of survey effort throughout the Gulf, by rejecting permit applications or requiring modification of permit applications that duplicate, in whole or in part, other surveys occurring in the same locations for the same or similar purposes; and consider requiring operators of 3D surveys to acquire, process, provide data in such a way as to obviate the need for high-resolution site surveys.

(4) Require separation of seismic vessels to reduce the potential impacts of overlapping sound fields.

(5) Consider actionable alternatives to accelerate the development and use of technological alternatives to existing airgun technology, as recommended by two recent workshop reports, such as by creating an adaptive management process by which such technologies or modifications can be required as they become available, deferring surveys in particular areas or for particular purposes, and providing regulatory incentives.

(6) Require BOEMRE to (a) ensure that operators reduce the effective source levels of their surveys to the lowest practicable level, and provide an objective, transparent standard and oversight mechanism to ensure compliance; and (b) require operators to calibrate their airgun arrays before beginning a survey in order to minimize horizontal propagation of the noise signal, and report field-checked source levels to the agencies for purposes of transparency and compliance.

(7) Expand the application of BOEMRE's existing marine mammal safety zone in the Gulf of Mexico, and recalculate safety zone distances in light of several recent studies on threshold shift and acoustic propagation.

I. IMPACTS OF AIRGUN SURVEYS AND OTHER G&G ACTIVITIES

The ocean is an acoustic world. Unlike light, sound travels extremely efficiently in seawater; and marine mammals and many fish depend on sound for finding mates, foraging, avoiding predators, navigating, and communicating – in short, for virtually every vital life function. When loud sounds are introduced into the ocean, it degrades this essential part of the environment. Some biologists have analogized the increasing levels of noise from human activities as a rising tide of "smog" that has industrialized major portions of the marine environment off our coasts. This acoustic smog is already shrinking the sensory range of marine animals by orders of magnitude from pre-industrial levels.[2]

For offshore exploration, the oil and gas industry typically rely on arrays of airguns, which are towed behind ships and release intense impulses of compressed air into the water about once every 10-12 seconds.[3] A large seismic airgun array can produce effective peak pressures of sound higher than those of virtually any other man-made source save explosives;[4] and although airguns are vertically oriented within the water column, horizontal propagation is so significant as to make them, even under present use, one of the leading contributors to low-frequency ambient noise thousands of miles from any given survey.[5] It is well established that the high-intensity pulses produced by airguns can cause a range of impacts on marine mammals, fish, and other marine life, including broad habitat displacement, disruption of vital behaviors essential to foraging

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[2] Bode, M., Clark, C.W., Cooke, J., Crowder, L.B., Deak, T., Green, J.E., Greig, L., Hildebrand, J., Kappel, C., Kroeker, K.J., Loseto, L.L., Mangel, M., Ramasco, J.J., Reeves, R.R., Suydam, R., Weilgart, L., Statement to President Barack Obama of Participants of the Workshop on Assessing the Cumulative Impacts of Underwater Noise with Other Anthropogenic Stressors on Marine Mammals (2009).

[3] Deep seismic surveys are not used for renewable energy projects.

[4] National Research Council, *Ocean Noise and Marine Mammals* (2003).

[5] Nieukirk, S.L., Stafford, K.M., Mellinger, D.K., Dziak, R.P., and Fox, C.G., Low-frequency whale and seismic airgun sounds recorded in the mid-Atlantic Ocean, *Journal of the Acoustical Society of America* 115: 1832-1843 (2004).

and breeding, loss of biological diversity, and, in some circumstances, injuries and mortalities.[6]

The impacts of airgun surveys are felt on an extraordinarily wide geographic scale – especially on endangered baleen whales, whose vocalizations and acoustic sensitivities overlap with the enormous low-frequency energy that airguns put in the water. For example, a single seismic survey has been shown to cause endangered fin and humpback whales to stop vocalizing – a behavior essential to breeding and foraging – over an area at least 100,000 square nautical miles in size, and can cause baleen whales to abandon habitat over the same scale.[7] Similarly, airgun noise can also mask the calls of vocalizing baleen whales over vast distances, substantially compromising their ability to communicate, feed, find mates, and engage in other vital behavior.[8] The intermittency of airgun pulses hardly mitigates this effect since their acoustic energy spreads over time and can sound virtually continuous at distances from the array.[9] According to recent modeling from Cornell and NOAA, the highly endangered North Atlantic right whale is particularly vulnerable to masking effects from airguns and other sources given the acoustic and behavioral characteristics of its calls.[10] Repeated insult from airgun surveys, over months and seasons, would come on top of already urbanized levels of background noise and, cumulatively and individually, would pose a significant threat to populations of marine mammals.

Airguns are also known to affect a broad range of other marine mammal species beyond the endangered great whales. For example, sperm whale foraging appears to decline significantly on exposure to even moderate levels of airgun noise, with potentially

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[6] *See*, *e.g.*, Hildebrand, J.A., Impacts of anthropogenic sound, *in* Reynolds, J.E. III, Perrin, W.F., Reeves, R.R., Montgomery, S., and Ragen, T.J. (eds), *Marine Mammal Research: Conservation beyond Crisis* (2006); Weilgart, L., The impacts of anthropogenic ocean noise on cetaceans and implications for management. *Canadian Journal of Zoology* 85: 1091-1116 (2007).

[7] Clark, C.W., and Gagnon, G.C., Considering the temporal and spatial scales of noise exposures from seismic surveys on baleen whales (2006) (IWC Sci. Comm. Doc. IWC/SC/58/E9); Clark, C.W., pers. comm. with M. Jasny, NRDC (Apr. 2010); *see also* MacLeod, K., Simmonds, M.P., and Murray, E., Abundance of fin (*Balaenoptera physalus*) and sei whales (*B. Borealis*) amid oil exploration and development off northwest Scotland, *Journal of Cetacean Research and Management* 8: 247-254 (2006).

[8] Clark, C.W., Ellison, W.T., Southall, B.L., Hatch, L., van Parijs, S., Frankel, A., and Ponirakis, D., Acoustic masking in marine ecosystems as a function of anthropogenic sound sources (2009) (IWC Sci. Comm. Doc. SC/61/E10).

[9] *Id.*; Weilgart, L. (ed.), Report of the workshop on alternative technologies to seismic airgun surveys for oil and gas exploration and their potential for reducing impacts on marine mammals, 31 Aug. – 1 Sept., 2009, Monterey, Calif. (2010) (available at www.okeanos-stiftung.org/okeanos/download.php?id=19).

[10] Clark et al., Acoustic masking in marine ecosystems as a function of anthropogenic sound sources; Clark, C.W., Ellison, W.T., Southall, B.L., Hatch, L., Van Parijs, S.M., Frankel, A., and Ponirakis, D., Acoustic masking in marine ecosystems: Intuitions, analysis, and implication, *Marine Ecology Progress Series* 395: 201-222 (2009).

serious long-term consequences;[11] and harbor porpoises have been seen to engage in strong avoidance responses fifty miles from an array.[12] Seismic surveys have been implicated in the long-term loss of marine mammal biodiversity off the coast of Brazil.[13]

Airgun surveys are also known to significant affect the distribution of some prey species, which could in turn displace marine mammals or have significant impacts on their foraging. For example, airguns have been shown to dramatically depress catch rates of some commercial fish species, by 40 to 80% depending on catch method, over thousands of square kilometers around a single array,[14] leading fishermen in some parts of the world to seek industry compensation for their losses. Other impacts on commercially harvested fish include habitat abandonment – one hypothesized explanation for the fallen catch rates – reduced reproductive performance, and hearing loss;[15] and recent data suggest that loud, low-frequency sound also disrupts chorusing in black drum fish, a behavior essential to breeding in this commercial species.[16]

In short, the G&G activities under review, and particularly the airgun surveys that presently represent the dominant means of offshore exploration, are likely to significantly impact commercial fisheries and the habitat of endangered whales and other marine mammals.

II. COMPLIANCE WITH THE MMPA

The Marine Mammal Protection Act was adopted more than thirty years ago to ameliorate the consequences of human impacts on marine mammals. Its goal is to

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[11] Miller, P.J.O., Johnson, M.P., Madsen, P.T., Biassoni, N., Quero, M., and Tyack, P.L., Using at-sea experiments to study the effects of airguns on the foraging behavior of sperm whales in the Gulf of Mexico, *Deep-Sea Research I* 56: 1168-1181 (2009).

[12] Bain, D.E., and Williams, R., Long-range effects of airgun noise on marine mammals: responses as a function of received sound level and distance (2006) (IWC Sci. Comm. Doc. IWC/SC/58/E35).

[13] Parente, C.L., Pauline de Araújo, J., and Elisabeth de Araújo, M., Diversity of cetaceans as tool in monitoring environmental impacts of seismic surveys, *Biota Neotropica* 7(1) (2007).

[14] Engås, A., Løkkeborg, S., Ona, E., and Soldal, A.V., Effects of seismic shooting on local abundance and catch rates of cod (*Gadus morhua*) and haddock (*Melanogrammus aeglefinus*), *Canadian Journal of Fisheries and Aquatic Sciences* 53: 2238-2249 (1996); *see also* Skalski, J.R., Pearson, W.H., and Malme, C.I., Effects of sounds from a geophysical survey device on catch-per-unit-effort in a hook-and-line fishery for rockfish (*Sebastes ssp.*), *Canadian Journal of Fisheries and Aquatic Sciences* 49: 1357-1365 (1992).

[15] McCauley, R.D., Fewtrell, J., Duncan, A.J., Jenner, C., Jenner, M.-N., Penrose, J.D., Prince, R.I.T., Adhitya, A., Murdoch, J. and McCabe, K., Marine seismic surveys: analysis and propagation of air-gun signals, and effects of air-gun exposure on humpback whales, sea turtles, fishes, and squid (2000) (report by Curtin U. of Technology); McCauley, R., Fewtrell, J., and Popper, A.N., High intensity anthropogenic sound damages fish ears, *Journal of the Acoustical Society of America* 113: 638-642 (2003); Scholik, A.R., and Yan, H.Y., Effects of boat engine noise on the auditory sensitivity of the fathead minnow, *Pimephales promelas*, *Environmental Biology of Fishes* 63: 203-209 (2002).

[16] Clark, C.W., pers. comm. with M. Jasny, NRDC (Apr. 2010).

protect and promote the growth of marine mammal populations "to the greatest extent feasible commensurate with sound policies of resource management" and to "maintain the health and stability of the marine ecosystem." 16 U.S.C. § 1361(6). A careful approach to management was necessary given the vulnerable status of many of these populations as well as the difficulty of measuring the impacts of human activities on marine mammals in the wild. 16 U.S.C. § 1361(l), (3). "[I]t seems elementary common sense," the House Committee on Merchant Marine and Fisheries observed in sending the bill to the floor, "that legislation should be adopted to require that we act conservatively—that no steps should be taken regarding these animals that might prove to be adverse or even irreversible in their effects until more is known. As far as could be done, we have endeavored to build such a conservative bias into the [Marine Mammal Protection Act]." Report of the House Committee on Merchant Marines and Fisheries, *reprinted in* 1972 U.S. Code Cong. & Admin. News 4148.

The heart of the MMPA is its so-called "take" provision, a moratorium on the harassing, hunting, or killing of marine mammals. 16 U.S.C. § 1362(13). Under the law, NMFS may grant exceptions to the take prohibition, provided it determines, *inter alia*, that such take would (a) take only small numbers of marine mammals and (b) have only a negligible impact on marine mammal species and stocks. It should be noted that the "small numbers" and "negligible impact" determinations are legally separate and distinct requirements of the MMPA and may not be conflated. 279 *NRDC v. Evans*, F.Supp.2d 1129, 1150-53. Finally, in authorizing take under the Act, NMFS must prescribe "methods" and "means of effecting the least practicable impact" on protected species as well as "requirements pertaining to the monitoring and reporting of such taking." 16 U.S.C. §§ 1371(a)(5)(A)(ii), (D)(vi).

A. Impact Analysis

We ask that NMFS take note of the following key points in conducting its impact assessment under the MMPA.

(1) *Threshold used to estimate sublethal behavioral take.*— In its 2011 application, BOEMRE uses a single sound pressure level (here, 160 dB (RMS)) as a threshold for behavioral, sublethal take in all marine mammal species. This approach simply does not reflect the best available science, and the choice of threshold is flawed and non-conservative in several important respects:

- The method represents a step backward from recent programmatic authorizations. For Navy sonar activity, NMFS has used a combination of specific bright-line thresholds (for harbor porpoises) and linear risk functions that endeavor to take account of risk and individual variability and to reflect the potential for take at relatively low levels. *E.g.*, 74 Fed. Reg. 4844, 4844-4885 (Jan. 27, 2009). In the wake of these past authorizations for acoustic impacts on marine mammals, BOEMRE's reversion to a single, non-conservative, bright-line threshold for all species is simply not tenable.

- The 160 dB threshold is non-conservative, since the scientific literature establishes that behavioral disruption can occur at substantially lower received levels for some species. *See supra* at Section I; *see also Ocean Mammal Institute v. Gates*, 546 F. Supp.2d 960, 973-75 (D.Hawaii 2008) (citing evidence of impacts below behavioral harassment threshold to find threshold arbitrary and capricious).
- The use of a multi-pulse standard for behavior harassment is non-conservative, since it does not take into account the spreading of seismic pulses over time beyond a certain distance from the array.[17]
- The threshold's basis in RMS, rather than peak pressure, is non-conservative. Madsen (2005) criticized the use of RMS for seismic because of the degree to which pulsed sounds must be "stretched," which indeed BOEMRE recognizes in its application (2011 App. at A-2).[18]

NMFS must revise the thresholds and methodology used to estimate take. Specifically, we urge the following:

(a) NMFS should employ a combination of specific thresholds for which sufficient species-specific data are available and generalized thresholds for all other species.[19] These thresholds should be expressed as linear risk functions where appropriate.

(b) Species-specific thresholds for sperm whales should be based primarily on Miller et al. (2007), and such thresholds for beaked whales should be based primarily on Tyack et al. (2011); masking thresholds for baleen whales, including Bryde's whales, should be derived from Clark et al. (2009).[20] Data on species for which specific thresholds are developed should be included in deriving generalized thresholds for species for which less data are available.

(c) In deriving its take thresholds, NMFS should treat airgun arrays as a mixed acoustic type, behaving as a multi-pulse source closer to the array

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[17] *See* Brower, H., Clark, C.W., Ferguson, M., Gedamke, J., Southall, B., and Suydam, R., Expert panel review of monitoring protocols in applications for incidental harassment authorizations related to oil and gas exploration in the Chukchi and Beaufort Seas, 2011: Statoil and ION Geophysical (2011).

[18] Madsen, P.T., Marine mammals and noise: Problems with root-mean-squared sound pressure level for transients, *Journal of the Acoustical Society of America* 117:3952-57 (2005).

[19] By "thresholds," we mean either bright-line thresholds or linear risk functions.

[20] Miller *et al.*, Using at-sea experiments to study the effects of airguns on the foraging behavior of sperm whales; Tyack, P.L., Zimmer, W.M.X., Moretti, D., Southall, B.L., Claridge, D.E., Durban, J.W., Clark, C.W., D'Amico, A., DiMarzio, N., Jarvis, S., McCarthy, E., Morrissey, R., Ward, J., and Boyd, I.L., Beaked whales respond to stimulated and actual Navy sonar, *PLoS ONE* 6(3):e17009. Dot10.1371/journalpone.0017009 (2011); Clark *et al.*, Acoustic masking in marine ecosystems: Intuitions, analysis, and implication. *See also* Clark *et al.*, Acoustic masking in marine ecosystems as a function of anthropogenic sound sources.

and, in effect, as a continuous noise source further from the array, per the findings of the 2011 Open Water Panel cited above. Take thresholds for the multi-pulse component should be based on peak pressure rather than on RMS.

(d) Finally, we recommend that NMFS solicit expert opinion on behavioral take thresholds in an open and transparent manner.

(2) *Potential for hearing loss and other debilitating injury.*— In its application, BOEMRE runs take numbers for two thresholds of "Level A" injury, the threshold "traditionally" used by NMFS for seismic surveys (180 dB (RMS)) and the threshold suggested by Southall et al. (2007) for multi-pulse sources (which it characterizes as 230 dB (flat)), but argues that the higher level should apply. We do not agree with BOEMRE's rationale for adopting the higher level; even if a higher level were adopted for death and permanent injury, however, NMFS should retain a threshold no higher than 180 dB (peak) (assuming the agency uses a pressure level rather than energy level standard) in order to address temporary threshold shift, which, for several reasons, has received separate take analysis in prior noise authorizations. *E.g.*, 74 Fed. Reg. 4844, 4874 (Jan. 27, 2009). Furthermore, in determining thresholds for temporary and permanent threshold shift, NMFS must take account of a number of recent papers that suggest current thresholds are not sufficiently conservative. See *infra* at II(B)(7)(b).

(3) *Source level used to calculate take.*— In its application, BOEMRE posits 230 dB (RMS) as a "typical" source level for purposes of modeling takes from airgun surveys (2011 App. at 24), but more information and analysis are needed to determine whether this critical value is appropriate. *First*, BOEMRE does not submit, in its take application, any data supporting this approach. NMFS should require BOEMRE to provide data indicating the source levels and sizes of seismic arrays used over a suitable period in the Gulf of Mexico, and should make that information publicly available in the DEIS and proposed rulemaking.

Second, it is not self-evident that using a single "typical" or "average" source level is a reasonable and sufficiently conservative approach to NMFS' take analysis. As BOEMRE recognizes, the effective source levels of industry arrays may run considerably higher or lower than the one used in BOEMRE's modeling (2011 App. at 24). Given that impact areas grow exponentially with increases in source levels, the undercount that would result from excluding surveys with higher source levels could vastly exceed the overcount that would result from excluding surveys with lower source levels. For this reason, NMFS should conduct a sensitivity analysis to ensure that any representative level, or levels, chosen for modeling do not negatively bias the analysis towards an undercount of take. If there is negative bias, NMFS should modify the source level, or levels, and require BOEMRE to rerun the model or use a conservative corrective factor to estimate take.

(4) *Cumulative acoustic impacts from G&G and other offshore oil and gas activity.* — Given the extent of seismic and other industry activity in the northern Gulf, it is plain that NMFS must carefully consider cumulative impacts in making its negligible impact determination under the MMPA. Unfortunately, BOEMRE's application does not make any attempt at cumulative effects analysis. Optimally, NMFS would translate sublethal takes into impacts on vital rates of individuals and ultimately on populations of Gulf marine mammals. Such an approach is consistent with the 2005 National Research Council report, "Marine Mammal Populations and Ocean Noise," and the means of accomplishing part of the NRC's analysis are now becoming available.[21]

With respect to airguns, the data already show that industry noise can disrupt the biologically significant behavior and shrink the communication range of baleen whales on a region-wide scale. As Dr. Chris Clark (Cornell) postulated in the report of the International Whaling Commission's Scientific Committee, such repeated and persistent acoustic insults over the large areas affected by airgun surveys should be considered enough to cause population-level impacts in at least some species of marine mammals.[22]

We recognize, however, that a complete quantitative analysis, encompassing each of the steps of the NRC's cumulative impacts model, may not yet be possible and that NMFS may need to rely on a more limited analysis based on the best available science. In conducting that analysis, NMFS should conservatively assume that any substantial decrements in the communication range of Bryde's whales caused by seismic surveys will result in adverse impacts on the stock. A conservative approach is justified given the available data and modeling on other baleen whale species, the potentially extreme vulnerability of the Bryde's whale stock, and the difficulty of obtaining empirical data on population-level impacts on wild marine animals.[23] The impacts of seismic exploration would occur in an already compromised acoustic environment, which should also be taken into account. NMFS should take a similar approach with respect to sperm whales, and likewise consider that any substantial decrement in foraging on that stock will result in adverse population impacts.

(5) *Non-acoustic cumulative impacts from other activities.*— In determining whether the proposed activities will have a greater than negligible impact on Gulf species and stocks, NMFS must consider the impacts of other activities and

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[21] National Research Council (NRC), *Marine Mammal Populations and Ocean Noise: Determining When Noise Causes Biologically Significant Effects* (2005).

[22] IWC Scientific Committee, Report of the 2004 Scientific Committee of the International Whaling Commission, Annex K: Report of the Standing Working Group on Environmental Concerns (2004).

[23] *See*, *e.g.*, Taylor, B.L., Martinez, M., Gerrodette, T., and Barlow, J., Lessons from monitoring trends in abundance of marine mammals, *Marine Mammal Science* 23: 157-175 (2007).

events into its environmental analysis, including non-acoustic impacts from ship-strikes, bycatch and entanglements, the *Deepwater Horizon* oil spill, and other stressors on the same species and populations affected by offshore exploration activities. Most pressingly, NMFS should consider whether the *Deepwater Horizon* spill establishes new baselines for population abundance and prey availability and for the capacity of certain species to withstand additional stressors.

(6) *Population status of Bryde's whales.*— It is imperative that NMFS determine the population structure of Gulf Bryde's whales before finalizing its authorization.

NMFS' December 2009 stock assessment puts the number of Bryde's whales left in the Gulf at fewer than 50 individuals –[24] a number that would leave it highly vulnerable, particularly if it constitutes a resident population as several studies have suggested.[25] The stock assessment notes that additional genetic, morphological, and/or behavioral data are needed to provide further information on stock delineation from Atlantic Bryde's whales. This information is critical not only because of the extremely small size of the stock, but because of the whales' reliable occurrence in the DeSoto Canyon, an area of interest for oil and gas exploration and production.

It is our understanding that NMFS' Southeast Regional Science Center is presently analyzing DNA samples of Gulf Bryde's and, to a lesser extent, of Atlantic Bryde's whales, and will produce a paper on the Gulf stock's genetics within several months. Investigators believe that samples from the Gulf are probably sufficient in number and data quality to make findings about delineation, but that more samples from Atlantic Bryde's whales must be analyzed before conclusions can be drawn. The next step for genetic research therefore requires expanding the available dataset on Atlantic Bryde's whales, by locating samples in archives in the U.S. and abroad (since the whales are not known to occur in high densities in the northwest Atlantic), and either obtaining those samples or working with other researchers to run the genetics.

Both the MMPA and NEPA require NMFS to obtain these genetic data. Under the MMPA, the agency must affirmatively find that BOEMRE's activities will have no more than a negligible impact of a species or stock. 16 U.S.C. §§ 1371(a)(5)(A)(i), (D)(i)(I). Clearly information on Bryde's whale stock

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[24] Waring, G.T., Josephson, E., Maze-Foley, K., and Rosel, P.E. eds., U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments – 2010, at 489-92 (2010).

[25] Mead, J.G., Records of sei and Bryde's whales from the Atlantic coast of the United States, the Gulf of Mexico, and the Caribbean, *Reports of the International Whaling Commission Special Issue* 1:113-116 (1977); Schmidly, D.J., Marine mammals of the southeastern United States and the Gulf of Mexico, (1981) (Report No. FWS/OBS-80/41); Jefferson, T.A., and Schiro, A.J., Distribution of cetaceans in the offshore Gulf of Mexico, *Mammal Review* 27:27-50 (1997).

structure is essential to NMFS' analysis, since its ability to make a negligible impact finding depends significantly on whether the whales constitute a small, demographically discrete population of animals. Under NEPA, which NMFS must satisfy in issuing an MMPA authorization, the agency must obtain and disclose any information necessary to its analysis of environmental impacts or alternatives, unless the costs of doing so are exorbitant. 40 C.F.R. § 1502.22(a).

We therefore urge NMFS to conduct the comparative genetics, or else determine that the Atlantic population samples available in U.S. and foreign archives are not sufficient for any meaningful analysis. If the issue remains unresolved, NMFS must follow the delineation indicated in the most recent stock assessment, and proceed on the assumption that Bryde's whales constitute a distinct stock.[26] This will require NMFS, in issuing an authorization, to adopt whatever mitigation is necessary to reduce impacts on the Gulf's small Bryde's stock below the allowable threshold.

B. Mitigation Analysis

(1) Area Closures and Restrictions

There is general consensus that time and place restrictions designed to protect high-value habitat are one of the most effective means to reduce the potential impacts of noise and disturbance, including noise from oil and gas exploration.[27] In the Gulf of Mexico, areas of biological significance for marine mammals include:

(a) Mississippi Canyon.— It is well established, on the basis of historic whaling records, mark-recapture data, and extensive surveys including by GulfCet II and the Sperm Whale Seismic Study, that this area constitutes important habitat for the Gulf's small, biologically distinct population of sperm whales,[28] most likely due to the input of a nutrient-

[26] Waring *et al.*, U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments at 489.

[27] Agardy, T., Aguilar Soto, N., Cañadas, A., Engel, M., Frantzis, A., Hatch, L., Hoyt, E., Kaschner, K., LaBrecque, E., Martin, V., Notarbartolo di Sciara, G., Pavan, G., Servidio, A., Smith, B., Wang, J., Weilgart, L., Wintle, B., and Wright, A, A global scientific workshop on spatio-temporal management of noise, Report of workshop held in Puerto Calero, Lanzarote, June 4-6, 2007 (2007); Dolman, S., Aguilar Soto, N., Notabartolo di Sciara, G., Andre, M., Evans, P., Frisch, H., Gannier, A., Gordon, J., Jasny, M., Johnson, M., Papanicolopulu, I., Panigada, S., Tyack, P., and Wright, A., Technical report on effective mitigation for active sonar and beaked whales (2009) (working group convened by European Cetacean Society); OSPAR Commission, Assessment of the environmental impact of underwater noise (2009) (report issued as part of OSPAR Biodiversity Series, London, UK); Memorandum from Dr. Jane Lubchenco, NOAA Administrator, to Ms. Nancy Sutley, CEQ Chair (Jan. 19, 2010).

[28] *E.g.*, Townsend, C.H., The distribution of certain whales as shown by logbook records of American whaleships, *Zoologica: Scientific Contributions of the New York Zoological Society* 19:3-50 (1935); Biggs, D.C., Leben, R.R., and Ortega-Ortiz, J.G., Ship and satellite studies of mesoscale circulation and sperm whale habitats in the northeast Gulf of Mexico during GulfCet II, *Gulf of Mexico Science* 18:15-22 (2000); Weller, D.W., Würsig, B., Lynn, S.K., and Schiro, A.J., Preliminary findings on the

rich, freshwater plume from the Mississippi Delta.[29] Nearly all sightings of females and mother-calf groups have occurred there, strongly suggesting it functions as a nursery ground.[30]

(b) *DeSoto Canyon.*— The DeSoto Canyon represents important habitat for Bryde's whales, the most commonly occurring baleen whale in the Gulf of Mexico, as well as habitat for sperm whale and other cetaceans. Nearly all known sightings of Bryde's whales have occurred in the canyon.[31] The stock size is estimated as well under 50 animals, leaving it highly vulnerable particularly if it constitutes a resident population as several studies have suggested.[32] It should be noted that BOEMRE's AIM Modeling projects Bryde's whale densities over a much larger area (2011 App. at A-44 to A-46), probably resulting in much lower levels of take than would be presumed to occur for surveys sited directly in the DeSoto Canyon.

(c) *Coastal waters landward of the 20m isobath.*— The coastal ecotype of bottlenose dolphin comprises more than 30 identified stocks across the Northern Gulf, many of which have best population estimates well below 100 individual animals;[33] and manatees are an ESA-listed species whose habitat choices are highly correlated to the absence of predominantly low-frequency sound.[34] These waters provide habitat for both species. The primary calving season for coastal bottlenose dolphins runs from

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occurrence and site fidelity of photo-identified sperm whales (*Physeter macrocephalus*) in the northern Gulf of Mexico, Gulf of Mexico Science 18:35-39 (2000); Baumgartner, M.F., Mullin, K.D., May, L.N., and Leming, T.D., Cetacean habitats in the northern Gulf of Mexico, *Fishery Bulletin, U.S.* 99:219-239 (2001); Jochens, A., Biggs, D., Engelhaupt, D., Gordon, J., Jaquet, N., Johnson, M., Leben, R., Mate, B., Miller, P., Ortega-Ortiz, J., Thode, A., Tyack, P., Wormuth, J., Wűrsig, B., Sperm whale seismic study in the Gulf of Mexico: Summary report, 2002-2004 (2006) (OCS Study MMS 2006-034).

[29] Davis, R.W., Ortega-Ortiz, J.G., Ribic, C.A., Evans, W.E., Biggs, D.C., Ressler, P.H., Cady, R.B., Leben, R.R., Mullin, K.D., and Wűrsig, B., Cetacean habitat in the northern oceanic Gulf of Mexico, *Deep-Sea Research* 49:121-142 (2002).

[30] *E.g.*, Weller *et al.*, Preliminary findings; Jochens *et al.*, Sperm whale seismic study.

[31] Maze-Foley, K., and Mullin, K.D., Cetaceans of the oceanic northern Gulf of Mexico: Distributions, group sizes, and interspecific associations, *Journal of Cetacean Research and Management* 8(2):203-213 (2006).

[32] Mead, Records of sei and Bryde's whales; Schmidly, Marine mammals of the southeastern United States and the Gulf of Mexico; Jefferson and Schiro, Distribution of cetaceans in the offshore Gulf of Mexico.

[33] Waring *et al.*, U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments.

[34] Miksis-Olds, J.L., and Miller, J.H., Transmission loss in manatee habitats, *Journal of the Acoustical Society of America* 120:2320:2327 (2006); Miksis-Olds, J.L., Donaghay, P.L., Miller, J.H., Tyack, P.T., Nystuen, J.A., Noise level correlates with manatee use of foraging habitats, *Journal of the Acoustical Society of America* 121:3011-3020 (2007).

February through May, peaking in March and April, with a secondary calving season occurring in December.[35]

(d) West of the Florida Keys and Tortugas.— This area, which lies along the continental slope west of the islands, constitutes an area of consistent sperm whale concentration in the Eastern Gulf.[36]

(2) Activity Caps

NMFS must place meaningful caps on offshore activities that disrupt marine mammal behavior. As NOAA has found, "[t]here is currently a great deal of concern that a variety of human sources of marine sound (e.g., vessel traffic, seismic activity, sonar, and construction activities) are acting in a cumulative way to degrade the environment in which sound-sensitive animals communicate."[37] Airguns in particular can cause low-frequency background noise to rise significantly over very large areas of ocean,[38] and the best available evidence indicates that such noise can interfere with foraging in some species at moderate levels of exposure,[39] and substantially interfere with the communication abilities of marine mammals, particularly baleen whales, at very considerable distances.[40] These effects cannot be eliminated through the use of area closures alone, especially given the long distances at which they may occur – well beyond the 160 dB isopleth proposed by BOEMRE as the threshold for Level B take.

(a) Interim analysis.— In the short term (i.e., for the present programmatic rulemaking), NMFS should (1) consider multiple alternatives and activity caps for reducing cumulative exposures (well below 160 dB) in each planning region to the lowest practicable level; and (2) conservatively assume that any substantial decrement in the communication space of baleen whales (particularly Bryde's whales) or foraging ability of sperm whales (per Miller et al. 2009) will result in greater than negligible impacts on the species or population, and assign

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[35] Pers. comm., Dr. Tom Jefferson, with M. Jasny, NRDC (Jan. 2011).

[36] Mullin, K.D., and Fulling, G.L., Abundance of cetaceans in the oceanic northern Gulf of Mexico, 1996-2001, *Marine Mammal Science* 20:787-807 (2004).

[37] Memorandum from Dr. J. Lubchenco to Ms. N. Sutley.

[38] Nieukirk, S.L., Stafford, K.M., Mellinger, D.K., Dziak, R.P., and Fox, C.G., Low-frequency whale and seismic airgun sounds recorded in the mid-Atlantic Ocean, *Journal of the Acoustical Society of America* 115: 1832-1843 (2004).

[39] Miller *et al.*, Using at-sea experiments to study the effects of airguns on the foraging behavior of sperm whales.

[40] Clark and Gagnon, Considering the temporal and spatial scales of noise exposures; Clark *et al.*, Acoustic masking in marine ecosystems as a function of anthropogenic sound sources; Clark *et al.*, Acoustic masking in marine ecosystems: Intuitions, analysis, and implication.

seasonal or year-round caps that significantly reduce exposures for those whales. This analysis should integrate the product of the NOAA working group on mapping cumulative sound exposures in the U.S. OCS.

(b) *Complete quantitative analysis.*— NMFS should include, in any proposed rule, an adaptive management provision that allows it to prescribe activity caps based on a quantitative analysis of cumulative exposures from multiple anthropogenic noise sources; and should further require BOEMRE, through a monitoring program, to obtain the necessary data and sponsor the analysis of cumulative exposures, *e.g.*, through the use of a passive acoustic network.[41] Activity caps should reflect a conservative analysis of the cumulative sublethal effects of industry activities on whale communication ranges and other biologically important factors.

(3) Eliminating Unnecessary Survey Effort

NMFS should require BOEMRE to eliminate unnecessary duplication of survey effort throughout the Gulf, by rejecting permit applications or requiring modification of permit applications that duplicate, in whole or in part, other surveys occurring in the same locations for the same or similar purposes. This measure is consistent with the findings of the 2010 and 2011 Open Water Panels, which recommended requiring use of a common surveyor to eliminate redundancy in the Arctic.[42] In the Gulf where multi-buyer spec surveys are common, it may be more appropriate for BOEMRE to review applications for duplication, provided that standards and transparency and reporting requirements are set to ensure independent and rigorous review. We urge NMFS to ask BOEMRE to propose robust, transparent standards well in advance of the rulemaking, so that they can be tested and modified before being adopted by regulation.

Additionally, NMFS should consider requiring operators of 3D surveys to acquire or process data in such a way as to obviate the need for high-resolution

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[41] Hatch, L., Clark, C., Merrick, R., Van Parijs, S., Ponirakis, D., Schwehr, K., Thompson, M., and Wiley, D., Characterizing the relative contributions of large vessels to total ocean noise fields: A case study using the Garry E. Studds Stellwagen Bank National Marine Sanctuary, *Environmental Management* 42:735-752 (2008). *See also* Clark and Gagnon, Considering the temporal and spatial scales of noise exposures; Clark *et al.*, Acoustic masking in marine ecosystems as a function of anthropogenic sound sources; Clark *et al.*, Acoustic masking in marine ecosystems: Intuitions, analysis, and implication.

[42] Burns, J., Clark, C., Ferguson, M., Moore, S., Ragen, T., Southall, B., and Suydam, R. (2010). Expert panel review of monitoring and mitigation protocols in applications for incidental take authorizations related to oil and gas exploration, including seismic surveys, in the Chukchi and Beaufort Seas; Brower *et al.*, Expert panel review of monitoring protocols in applications for incidental harassment authorizations.

site surveys. As BOEMRE notes in its 2011 application, data processing of 3D seismic data is increasingly capable of yielding useful near-surface information, eliminating "many of the needs previously met" by high-resolution surveys (2011 App. at 2). NMFS, in consultation with BOEMRE, should consider a measure ensuring that 3D surveys are conducted, and their data provided, in a manner consistent with this purpose, provided that such a measure does not have countervailing environmental costs; and the agencies should consider mandating relevant research on signal processing in their EIS.

(4) Mitigating Effects of Overlapping Surveys

NMFS should require separation of seismic vessels to reduce the potential impacts of overlapping sound fields. As NMFS has noted, "the zone of seismic exclusion or influence could be quite large [if seismic operations overlap in time], depending on the number, and the relative proximity of the surveys."[43] It has been observed that the industry usually maintains an established distance between source vessels in order to avoid contaminating their own data. NMFS should prescribe vessel separation out to a conservative distance, requiring BOEMRE to review operating plans on a weekly or biweekly basis to ensure conformity with this requirement.

(5) Alternative Technologies

New technology represents a promising means of reducing the environmental footprint of seismic exploration. Industry experts and biologists participating in a September 2009 workshop reached the following conclusions: that airguns produce a great deal of "waste" sound and generate peak levels substantially higher than needed for offshore exploration; that a number of quieter technologies are either available now for commercial use or can be made available within the next five years; and that governments should accelerate development and use of these technologies through both research and development funding and regulatory engagement (Weilgart 2010; see also Spence 2007).[44]

NMFS and BOEMRE should thoroughly analyze source-based alternatives in their programmatic EIS. At the 2011 Arctic Open Water meeting, NMFS

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[43] NMFS, Biological Opinion: Oil and gas leasing and exploration activities in the U.S. Beaufort and Chukchi Seas, Alaska; and Authorization of Small Takes under the Marine Mammal Protection Act (2008).

[44] Weilgart, L. ed., Report of the workshop on alternative technologies to seismic airgun surveys for oil and gas exploration and their potential for reducing impacts on marine mammals, 31 Aug. – 1 Sept., 2009, Monterey, Calif. (2010) (available at www.okeanos-stiftung.org/okeanos/download.php?id=19). *See also* Spence, J., Fischer, R., Bahtiarian, M., Boroditsky, L., Jones, N., and Dempsey, R., Review of existing and future potential treatments for reducing underwater sound from oil and gas industry activities (2007) (NCE Report 07-001) (prepared by Noise Control Engineering for Joint Industry Programme on E&P Sound and Marine Life).

indicated that the agencies are already intending to identify such technologies, determine when they are likely to become available, and assess the extent of their potential application and mitigative effect. But it is critical that they also consider a range of actionable alternatives needed to bring that technology into commercial use, such as: (1) mandating the use of identified measures under appropriate conditions; (2) creating an adaptive process by which such measures can be required as such measures become available; (3) deferring the permitting of surveys in particular areas or for particular applications where effective mitigative technologies could reasonably be expected to become available within the life of the EIS; and (4) providing regulatory incentives for use of these technologies as was done for passive acoustic monitoring systems in NTL 2007-G02. NMFS' rulemaking, with its "least practicable impact" and "small numbers" and "negligible impact" requirements, and with its adaptive framework, is an appropriate vehicle for most of these alternatives.

Ultimately, given the long distances that noise travels, alternative technologies may represent the best way to reduce cumulative exposures and impacts from airgun surveys in the Gulf of Mexico. But, as Weilgart et al. (2010) suggests, such a goal will not be achieved within any reasonable timeframe without significant regulatory engagement.

(6) Other Source-Based Mitigation

NMFS should require BOEMRE to (a) ensure that operators reduce the effective source levels of their surveys to the lowest practicable level, and provide an objective, transparent standard and oversight mechanism to ensure compliance; and (b) require operators to calibrate their airgun arrays before beginning a survey in order to minimize horizontal propagation of the noise signal, and report field-checked source levels to the agencies for purposes of transparency and compliance. As with the Arctic, NMFS should prescribe a protocol for taking measurements in the field, both for minimizing horizontal propagation and for verifying source level estimates.

(7) Improving Safety Zones

(a) Application in Gulf of Mexico.— NMFS should expand the application of BOEMRE's existing marine mammal safety zone in the Gulf of Mexico. As it stands under NTL 2007-G02,[45] the safety zone for Gulf seismic surveys applies only to "whales," a category that definitionally excludes delphinids and manatees – a policy that is inconsistent with every past NMFS authorization of seismic surveys and other types of ocean noise. Additionally, the measure applies west of 88º W. longitude only in waters deeper than 200 meters, an arbitrary exclusion that is likewise inconsistent

[45] MMS Gulf of Mexico Region, Notice to Lessees: Implementation of seismic survey mitigation measures and protected species observer program (2007) (NTL 2007-G02).

with past MMPA authorizations. NMFS should prescribe a safety zone that covers all Gulf marine mammal species in all federal waters.

(b) *Safety zone distances.*— NMFS should conservatively recalculate its safety zone distances in light of recent studies on hearing loss: (1) a controlled exposure experiment demonstrating that harbor porpoises are substantially more susceptible to temporary threshold shift than the two species, bottlenose dolphins and belugas, that have previously been tested;[46] (2) a modeling effort indicating that, when uncertainties and individual variation are accounted for, a significant number of whales could suffer temporary threshold shift beyond 1 km from a seismic source;[47] and (3) studies suggesting that the relationship between temporary and permanent threshold shift may not be as predictable as previously believed.[48]

(c) *Best practices for maintenance and monitoring.*— More generally, NMFS should consider additional "best practices" for safety zone maintenance and monitoring, as set forth in Weir and Dolman (2007) and Parsons et al. (2009).[49]

III. CONCLUSION

As always, we would welcome the opportunity to meet with you, your staff, and other relevant offices at any time to discuss these matters. For further discussion, please contact Michael Jasny of NRDC (mjasny@nrdc.org).

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[46] Lucke, K., Siebert, U., Lepper, P.A., and Blanchet, M.-A., Temporary shift in masked hearing thresholds in a harbor porpoise (*Phocoena phocoena*) after exposure to seismic airgun stimuli, *Journal of the Acoustical Society of America* 125: 4060-4070 (2009).

[47] Gedamke, J., Gales, N., and Frydman, S., Assessing risk of baleen whale hearing loss from seismic surveys: The effect of uncertainty and individual variation, *Journal of the Acoustical Society of America* 129:496-506 (2011).

[48] Kastak, D., Mulsow, J., Ghoul, A., Reichmuth, C., Noise-induced permanent threshold shift in a harbor seal [abstract], *Journal of the Acoustical Society of America* 123: 2986 (2008) (sudden, non-linear induction of permanent threshold shift in harbor seal during TTS experiment); Kujawa, S.G., and Liberman, M.C., Adding insult to injury: Cochlear nerve degeneration after "temporary" noise-induced hearing loss, *Journal of Neuroscience* 29: 14077-14085 (2009) (mechanism linking temporary to permanent threshold shift).

[49] Weir, C.R., and Dolman, S.J., Comparative review of the regional marine mammal mitigation guidelines implemented during industrial seismic surveys, and guidance towards a worldwide standard, *Journal of International Wildlife Law and Policy* 10: 1-27 (2007); Parsons, E.C.M., Dolman, S.J., Jasny, M., Rose, N.A., Simmonds, M.P., and Wright, A.J., A critique of the UK's JNCC seismic survey guidelines for minimising acoustic disturbance to marine mammals: Best practice? *Marine Pollution Bulletin* 58: 643-651 (2009).

Very truly yours,

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Reference: RIN 0648-XA397. Taking and Importing Marine Mammals; Geological and Geophysical Exploration of Mineral and Energy Resources on the Outer Continental Shelf in the Gulf of Mexico.

The American Petroleum Institute (API), the International Association of Geophysical Contractors (IAGC), the Independent Petroleum Association of America (IPAA), the National Ocean Industries Association (NOIA) and the US Oil & Gas Association (USOGA) (hereinafter referred to as "the Associations") are pleased to provide the following comments in response to the June 14, 2011 National Marine Fisheries Service Federal Register Notice of Receipt of revised Application from the Bureau of Ocean Energy Management, Regulation, and Enforcement (BOEMRE) for Letters of Authorization (LOA) to "take" marine mammals incidental to seismic surveys for purposes of geological and geophysical exploration (G&G) on the Outer Continental Shelf (OCS) in the Gulf of Mexico (GOM).

The Associations represent hundreds of companies engaged in the exploration for and development of offshore oil and gas resources. The exploration activity covers a wide range of activities, which includes seismic as well as low impact, passive acquisition technologies like gravity, magnetic and micro seismic techniques. All seismic exploration techniques help reduce the safety and environmental exposure of future exploration activities. Some member companies offer seismic survey services, support them or acquire those services as a necessary and critical activity in the search for future supplies to fuel the nation's economy. As

is well documented, future oil discoveries are extremely difficult - if not nearly impossible without modern seismic-acoustic imaging techniques.

This action and future associated rulemaking has significant ramifications on domestic offshore oil and gas production and therefore should be handled with the care afforded major rulemaking with economic impacts greater than $100 million.

At present, there are no commercially available and viable alternatives to current geophysical imaging technologies, which have been employed but continuously refined over the last six decades to be more efficient and emit less sound energy. Improvements in seismic technologies have offered improved precision in subsurface imaging resulting in environmental benefits including the need for fewer facilities and improved drilling success and safety.

Future Implications

The Bureau of Ocean Energy Management Regulation and Enforcement (BOEMRE) request to revise the petition for an incidental taking of marine mammals in the Gulf of Mexico is an initiating event that will trigger future agency action necessary for development of a 5-year rule necessary for the National Marine Fisheries Service to issue Letters of Authorization under the Marine Mammal Protection Act (MMPA) to industry applicants.

We applaud BOEMRE and NMFS for moving forward with the process of developing Incidental take regulations for seismic surveys on the GOM OCS.

History of the Rulemaking

The NMFS June 14, 2011 Federal Register Notice notes some but not all of the history necessary to understand that this effort has been long underway:

- July 2002 – NMFS issues Biological Opinion for Gulf of Mexico Lease Sale 184 that addresses marine mammal acoustics take issues. There were two other related biological opinions, the Multi-Sales Biological Opinion and the Eastern Gulf of Mexico Biological Opinion.
- December 2002 – MMS petitions NMFS for incidental take rulemaking
- March-April 2003 – NMFS publishes notice of receipt of MMS incidental take authorization petition; seeks and extends the comment period to April 16, 2003
- November 2004 – NMFS publishes notice of intent to prepare an EIS and to hold public meetings in December 2004.
- April 18, 2011 – BOEMRE (MMS's successor agency) submits revised incidental take petition.
- June 14, 2011 – NMFS publishes notice of receipt of revised petition from BOEMRE and request for public comment.

Industry Engagement

Regulatory Process

The Associations support the BOEMRE, on behalf of industry, petitioning the NMFS for incidental takes authorization of marine mammals under the Marine Mammal Protection Act (MMPA).

Development of Scientific Knowledge

The Associations and their members support the use of the best available science-based information in the development of regulations. Over the years, industry has spent millions of dollars to assist in gaining new knowledge about marine sound in the environments where we operate. The industry via consortiums and company initiatives has been active in contributing to the development of new, independent peer-reviewed science on the topic. Industry scientists and engineers have collaborated with academics and government agencies in the U.S. and around the world. As a result, the industry is especially well situated to offer comment on scientific and technical details that are central to the BOEMRE petition and ultimately to NMFS's own work on promulgation of a five-year rulemaking. In addition to providing funding, industry also engages in scientific forums in search of practical solutions. Below are a few examples where Industry participates:

Industry Research Funders Collation (IRFC): In 2002, a group of major U.S. oil companies and the International Association of Geophysical Contractors (IAGC) provided funding in support of the MMS Gulf of Mexico Sperm Whale Seismic Study (SWSS). It was during this time that the industry also started funding the development of a passive acoustic monitoring interface software called "PAMGuard". PAMGuard now provides a valuable tool to those within the marine mammal community who use this free software for marine mammal detection and surveillance. It has also been used successfully as the PAM software on many seismic surveys that utilized a PAM system.

OGP E&P Sound & Marine Life Joint Industry Program (JIP): Since 2005, the JIP has, and still is, contributing to the search for new scientific knowledge with respect to sound and marine life. The JIP is comprised of E&P companies and IAGC and is administered by the International Association of Oil and Gas Producers (OGP). Spending in excess of $25M since 2005, the JIP has contributed to new science in the following areas (a) Sound Source Characterization and Propagation, (b) Physical, Physiological, and Hearing Effects, (c) Behavioral Reactions and Biologically Significant Effects, (d) Mitigation and Monitoring, and (e) Research Tools. Currently, a multi-million dollar/multi-year JIP project is being conducted offshore Australia, which seeks to better understand the potential impacts of seismic surveys on humpback whale behavior. This project is being co-funded by BOEMRE.

National Oceanographic Partnership Program (NOPP): For the last several years, industry has participated in various NOPP projects. For example, individual oil companies and the Sound & Marine Life JIP have funded projects in the areas of:
(a) determination of animal density using passive acoustic monitoring; (b) providing support to Stellwagen Bank passive acoustic studies for the protection of right whales; (c) new satellite tag development, and (d) next generation passive acoustic monitoring systems (funded by API members).

Industry Principles & Position

The industry encourages proper rulemaking in accordance with federal regulations. During these past years, industry has supported and encouraged both MMS/BOEMRE and NMFS to

complete their work. The basis for the rule making should be premised upon best available science and considered alternative actions. To achieve this, the regulatory activity should:

- Accurately portray the nature and scope of industry activities.
- Accurately characterize acoustics and marine biology.
- Accurately portray the environmental effects of industry actions and consider these in the broader context of other acoustic sources and risks to marine life recognizing the effectiveness of mitigation measures, recognizing that exposure to sound does not necessarily equal a "take".
- Assess the potential impact of industry operations using standard and accepted risk assessment approaches.
- Address uncertainty in a transparent, documented, reasonable and balanced manner.
- Progress the regulatory rulemaking.

Summary Assessment of BOEMRE Revised Petition

We have evaluated the BOEMRE revised Petition, employing the principles and positions outlined above. The industry appreciates BOEMRE's efforts to revise the petition. The inclusion of new research results and information is positive, but incomplete. There are significant research results that were omitted on important topics such as stapedial reflex that indicates that some marine mammal species, including dolphins common to the Gulf of Mexico, have the ability to selectively reduce their hearing sensitivity. In addition, the fact that dolphin hearing sensitivity is predominately in the mid-frequency range while seismic sources are predominately a low-frequency sound source is not addressed.

Industry comments below will go into considerable detail as required to highlight specific technical issues. However, it is important to not lose sight of the overarching question: "Does the revised petition accurately characterize risks/impacts and ultimately provide a reasonable estimate of incidental takes?" We believe that while well intended, the BOEMRE application greatly exaggerates the estimated number of takes. Furthermore, BOEMRE presents a model-driven estimate of incidental takes that used conservative assumptions and limited data in a fashion that incorrectly implies a level of knowledge and precision that neither the science nor the model support. In so doing, BOEMRE in essence makes the "model" the "decision maker" removing common sense, context, agency discretion and ignoring widely accepted methods for characterizing risk and uncertainty. The Associations do not believe that "exposure equals incident takes." Nor do the Associations take the position that BOEMRE must remedy all weaknesses in the AIM Model nor close every data gap before proceeding with the Application. The Associations do believe, however, that BOEMRE should explicitly and transparently acknowledge these uncertainties and apply reasonable discretion in its risk assessments recognizing that estimates of "takes" at present are imprecise and likely greatly overstated.

A common approach of validating impact assessments is to compare predictions with field observations. Yet, BOEMRE's petition does not explicitly consider the government's own stranding and Marine Mammal Observer (MMO) data and fails to explain the historical absence of observable physical or significant behavioral impacts from seismic activity on marine mammals. Given the level of scrutiny of the marine sound issue, the level of scientific inquiry/expense but absence of demonstrable impacts to animals over the last decade, it seems prudent to at least ask "What is the problem that demands so many resources?" Although technology has become increasingly sophisticated and better able to predict impacts,

no such impacts have been verified. The lack of a measured impact is a significant analytical gap and suggests the risk assessment conducted by BOEMRE has not been based on solid scientific analysis.

To understand how the risk assessment was overstated by what appears to be several orders of magnitude, one must examine the individual components: the data inputs, the layers of "uncertainty factor" that were added and finally the misuse of the various model components.

The industry comments provide (a) a high-level summary of issues that need attention, and (b) detailed recommended actions on acoustics, biology, acoustic thresholds, and use of the AIM model.

Summary Review of Application

- In our opinion, the Application does not properly consider past agency deliberations and scientific insights into differentiating diminimous sound exposure; short-term individual behavior effects; and finally population level effects as discussed in NRC 2005.
- Inaccurately characterized some industry activities and their acoustics emissions.
- Failed to characterize the important role seismic technologies bring in reducing drilling and other E&P risks.
- Omitted marine mammal observer and stranding data.
- In some cases, did not incorporate best available information on topics that have significant impact on the incidental take numbers including species population and density data; acoustic measurements, acoustic impact thresholds and new research on the hearing ranges of several species that would reduce the assessments of potential acoustic injury.
- Extrapolated marine mammal and acoustics data beyond acceptable limits.
- Inconsistent use and interpretation of marine mammal acoustic take thresholds, in particular, the treatment of recommendations made by an expert panel assembled by NMFS (Southall, et al. 2007) and, as a result fails to differentiate among various levels of impact by not adequately considering the variations in and differences among sound emission levels, received levels, individual animal hearing frequency ranges, short-term effects and behavioral effects that are biologically significant.
- Employed 'conservative factors' that have not been adequately disclosed, documented or linked to a scientific basis resulting in substantially inflated incidental take numbers.

Detailed Industry Comments

Industry Operations & Acoustics Characterizations:

- Section 1, page 1, according to industry experience, boomers, sparkers and chirpers are rarely used as sources in the GOM

- Section 1, page 2, 3-D line separations typically range from 300-600m, not 25-30 m as stated in the application. There seems to be confusion between receiver (streamer) line spacing and sail line spacing (which is the line on which the ship sails and thus is representative of the separation of the line in which seismic source arrays are towed). Array sizes used by oil and natural gas exploration and production industry also vary. In the GOM, seismic surveys have been

conducted with array sizes up to 8,000 in^3. "The streamer array might consist of 6 to 8 parallel cables, each 3,000 to 12,000 m long, spaced 25 to 100 m apart. An 8-streamer array used for deep water surveys is typically 700 m wide." (Section 1, page 2) Industry suggests that this is reworded to read "In current configurations, the streamer array may consist of up to 12 cables, each 3,000 to 12,000 m long, spaced from 25 to 150 m apart, depending on the sub-surface sampling required. A typical 10-streamer array used for deep water surveys can be up to 1,100m wide"

- Section 1, page 3 frequencies of acoustic transmitters used in OBS and node surveys are more typically 18-36 kHz range than the stated 9-13 kHz. In shallow water 35-55 kHz are more likely to be used. Some of the older systems, now being phased out, are 7.5-110 kHz.

- Section 2, page 4, BOEMRE's application states that surveys can last from days to weeks to months. It should be noted that wide azimuth surveys with vessels towing long streamers, especially wide azimuth with multiple vessels which must be properly aligned, will have many hours during line turns where the source arrays are either silent or are activating the smallest source element as a mitigation device. The seismic sources are not continually activated during these surveys. In addition, the vessels are moving several kilometers per day so any localized disturbance is limited to a very short time period in any given geographic area

- Section 2, Table 2-5, page 9, the title should be expanded to include 3D high resolution in addition to 2D

- The acoustic modeling methodology described in Section 6 and Appendix A, used to estimate the number of marine mammals potentially 'taken' incidental to seismic surveys, is subject to both limitations inherent in the environmental modeling, acoustic modeling and quality of available data. This leads to an overestimation of the number of anticipated takes due to acknowledged computational limits and gaps in data for both the physical environment and marine mammals

- Section 7, page 29, "Seismic sounds are predominately low frequency (<200 Hz), though airgun arrays also produce energy at higher frequencies that may negatively impact some delphinid species". The energy at higher frequencies is at a much lower source level and higher frequencies do not travel as far as low frequencies; therefore it is unlikely that any high frequencies produced by seismic arrays would result in physical harm or significant biological impact to delphinids (Richardson et al. 2011).

- Alternative technologies are mentioned in the revised petition as possible methods to minimize or reduce the amount of sound introduced to the water during seismic surveys (Section 11, page 31). The geophysical industry is currently researching and developing the methods described in Section 11 but as

mentioned previously, none of these methods are ready for widespread use on commercial seismic operations. It is difficult to predict future developments as there are several possible methods of reducing the impact of marine seismic sources on aquatic fauna. A few of these methods are described below:

- Further development of the seismic source element to reduce its high-frequency output;
- Reduction of the high frequency output of the whole array by staggering the activation times of the seismic source elements in the array so that the higher frequencies are removed by destructive interference;
- Utilization of smaller sources where this can be accomplished without compromising the image beyond usefulness;
- Utilization of vibratory sources instead of impulsive seismic sources that spread the emitted energy over a longer time and may be beneficial. They can also potentially be designed to emit fewer higher frequencies.

However, at present, none of these methods are a comparable, commercially available alternative to a tuned seismic source.

- While BOEMRE, in Section 1, briefly describes the benefits of the various categories of seismic surveys, it fails to adequately characterize the important role they play in reducing safety and environmental risks in the E&P operations, particularly in drilling operations. For example, in Section 1, Page 2, second paragraph, the Application notes "maximizing the success rate of exploration wells and minimizing the number of wells required to develop a field". In fact, the improvement of subsurface imaging as a result of technological advances in seismic data acquisition and processing have reduced historic industry practice of exploring with the drill bit, both in exploring for prospects and for the boundaries of a reservoir once it is discovered. And high-resolution surveys play a significant role in reducing risks associated with shallow hazards that, in the absence of such surveys, could lead to safety or environmental incidents.

Marine Biology Data Quality Issues

- BOEMRE did not utilize the most recent NMFS marine mammal stock assessment report (Waring et al., 2010). While this has no effect on the list of species present, it could change the best available information for numbers, seasonality, and geographic preference (depth and OCS region) impacting the incident take numbers. While use of the 2009 Stock Assessment Report (SAR) for individual species accounts (Section 4, Page 12) is an improvement on 2004 information, we suggest use of the 2010 SAR.

- Another potential concern is while BOEMRE is using NMFS sources for the species present (3) and more detailed accounts of those species (4), the model effort as detailed in Appendix A, states the U.S. Navy OPAREA Density Estimates (DoN, 2007b) are the best marine mammal density efforts available. The Navy effort was based on NMFS data - "NMFS was routinely consulted and provided much of the data..." - but a connection between the base LOA application account of species distributions and what was used for modeling is

missing. It is unclear whether the Navy density estimates are consistent with the most recent NMFS information?

- Some data on individual species biology data appear to be incorrect or obsolete. In some cases this information deals with the habitat, range or seasonal presence and therefore has important implications for misstating exposure to industry sound sources.

  - Baleen whales
    Wursig et al (2000), in their book on Gulf of Mexico marine mammals, established that few baleen whales are seen here and only one species (Byrde's) is considered a resident. The essential lack of baleen whales (low-frequency specialists) in the Gulf is significant for species at potential acoustic risk. It would be useful to verify this situation with more recent citations or perhaps personal communications with a NMFS expert.

  - Killer Whales
    Contradictory wording exists for distribution (at Page 12). While Reeves et al (2002) may state killer whales [across all clans] are not limited by such features as water depth, killer whale sightings in the GOM are all in deeper water. This needs to be better explained. In general, the use of Reeves et al. (2002) for generic statements on world distributions of marine mammals, while exceptional information for 2002, is often dated for 2011.

  - Short-finned Pilot Whale
    The short-finned pilot whale (Page 15-16) is an example where more recent population declines are a concern, although not specific to the GoM. Nevertheless this species has particular concerns that dated references fail to address.

  - Sperm Whale
    Recognizing both their iconic and ESA-listed status in the GoM, both regulators and industry have collaborated in research to better understand potential effects if any of seismic operations, on sperm whales.

    MMS, with significant cooperation from NMFS, NSF, and industry conducted a series of controlled exposure experiments (CEEs) using seismic source arrays and tagged sperm whales in the Gulf of Mexico (MMS 2008). The initial account of CEE results and context of this effort within the broader Sperm Whale Seismic Study (SWSS) are found in this MMS Final Report. Subject to external peer review, the published CEE results are found in Miller et al. (2009) and as part of a review of CEE methodology in Tyack (2009).

    SWSS refuted earlier speculation (Mate, 2004) that seismic surveys would disrupt sperm whale vocalization and displace whales over large-scale

areas of the GOM (MMS 2008; Richardson et al. 2011). The CEE effort focused on the behavior of individual sperm whales before, during, and after exposure to a seismic source. Over two seasons of effort, 8 sperm whales were tagged and exposed to seismic sources at distances calculated not to exceed 160 dB re: 1 µPa (rms). The most pronounced response was one tagged whale, already resting at the surface, delayed diving until minutes after the seismic source ceased operation.

The response by the sperm whales was mixed, limited, and short-term. While not discussed in these papers, there were observations of sperm whales' behavior disturbances due to tagging activity itself. Several dive cycles were allowed for the tagged whale to return "to normal" before exposures, in terms of the experimental design. That sperm whales often completely abandoned normal dive patterns after tag attachment or breach provides indications of what more pronounced disturbance responses can be and put the effects of exposure to seismic surveys in context.

The BOEMRE as the lead-agency for cooperative research on GOM sperm whales should update the revised petition to provide more recent information for sperm whale distribution obtained through results from SWAMP and SWSS studies. The 2004 citations concerning sperm whale concentrations off the Mississippi River delta and speculation on up-wellings has been very significantly updated by SWSS results and need to be better and more accurately addressed. Use of new density data will likely show the highest density would be in waters approximately 1000 meters and deeper.

- Bottlenose dolphins
  These are the only species of marine mammal expected in shallow waters (< 200 meters depth). One is less likely to see Atlantic spotted dolphins in shallow waters. The species accounts (Section 4, Page 19) state both are common in shallow water, contrary to the far greater expectation to see only bottlenose dolphins in coastal waters. For shallow-water operations, only one cetacean species would typically be subject to seismic sound exposure and any potential risk.

Hearing Sensitivity

The primary sense for cetaceans (whales and dolphins) is hearing. Cetaceans have evolved to both use sound underwater and also to protect their hearing mechanisms. Sperm whales click the majority of their lives. The typical sperm whale deep-dive navigational click has an estimated near-source sound intensity up to 236 dB dB re: 1 µPa (rms) and at least 210 dB dB re: 1 µPa (rms) with a click frequency that centers around 15 kHz (Mohl et. al 2003). Therefore, the source level of sperm whale clicks is above the current NMFS Level A noise exposure criteria of 180 dB re 1 µPa (rms).

Recent research by Supin et al. (2008) has revealed methods to measure the hearing of whales and dolphins while they echolocate. The researchers found that the false killer whale has a very active hearing control process – stapedial reflex. The false killer whale changes its overall hearing by 20 dB depending on whether it is searching, or has found, a target (Supin et al., 2008). Furthermore, the whale actively controls what it hears of its own loud outgoing signal, the return echo and its overall ambient hearing during echolocation (Supin et al., 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010). Of the 85 species of whales and dolphins it seems possible that the 73 echo-locators (including Sperm Whales) have the capability to control their hearing using stapedial reflex.

Sound Exposure & Acoustic Thresholds

The BOEMRE revised petition request would be improved by a fuller discussion of the history and underlying difficulties in establishing acoustic criteria and thresholds. If the petition had done so, industry believes that the state of knowledge, level of precision in knowledge, and levels of uncertainty could have been more explicit and the agency's judgments to address uncertainty made more transparent. This would have led to an improved, more transparent approach than the potential overuse of an imperfect predictive model that cannot replace judgment and context in decision-making.

Background

The Marine Mammal Protect Act (MMPA) was created to protect marine mammal populations from depletion or extinction. Then and now the largest known risk to marine mammal populations is the annual loss of cetaceans due to fisheries bycatch that has been estimated to approach 300-400 thousand animals per year (Moore et al. 2009; Read et al. 2006).

When the MMPA and ESA were initially crafted, acoustic takes were not a consideration. The decision to apply the MMPA and ESA for acoustic impacts and the various interpretations required for implementation of that decision resulted in considerable uncertainty due to technical data gaps and regulatory policy. Central to that decision was the notion that "exposure to sound equals harm whether or not there is harm. **The Associations then and now strongly oppose a regulatory approach premised on this notion that exposure equals an incidental take**.

Nonetheless, the regime of Level A "physical injury" incidental takes and Level B "behavioral" takes was applied. Physical injury -- Level A – was judged to occur if either mortality or a permanent threshold shift (PTS) occurred.

In 1995, NMFS established for Level A takes an underwater "do not exceed" criteria of 190 dB re: 1 µPa (rms) for most toothed whales (dolphins) and 180 dB re: 1 µPa (rms) for baleen whales, sperm whales, and pygmy/dwarf sperm whales (*Kogia* spp.).

In June 1997, a panel of experts, the High Energy Seismic Survey (HESS) team retained the 180 dB re: 1 µPa (rms) limit as the threshold for potential injury (Level A). At the same time NMFS modified the 180 dB re: 1 µPa (rms) exposure criterion to apply to all cetaceans while 190 dB re: 1 µPa (rms) was to be used for seals. At that time and since, there was greater confidence in the levels set for Level A (physical injury) due to the fact that the

threshold for physical injury was determined to be Temporary Threshold Shift (TTS) and was measurable. Sound exposure levels established for disturbance or harassment (Level B) was highly debated because of the difficulty in knowing when an observed behavior resulted from exposure to sound or was merely a natural response or a response to some other factor in the environment.

After increasing public attention to the potential impact of marine sound, the Marine Mammal Noise Exposure Criteria Work Group (the Southall Work Group) (Southall et al. 2007) was formed in the early 2000's to review the body of scientific evidence and recommend thresholds that regulators could employ. The Southall Work Group examined the prior Hess work and determined that those levels were "precautionary estimates" below which physical injury was considered unlikely (Southall et al. 2007). After reviewing all the available research, the Southall Work Group proposed a threshold for Level A injury of 230 dB re: 1 µPa (peak) (flat) (or 198 dB re 1 μPa^2-s, sound exposure level). The Southall Work Group also repeatedly stated that precaution factors had also been applied in creating its own new proposed criteria.

Estimates of Potential Level A and B "Takes"

As noted, it is not clear from reading the Application what thresholds are will be used. It is important for the Application therefore to clearly define what constitutes a take and why and what thresholds will be utilized in the rulemaking.

Level A

The growing scientific consensus is that seismic sources pose little risk of Level A takes (Southall, 2010; Richardson et al. 2011). Southall and Richardson recommended BOEMRE a Level A threshold, 230 dB re: 1 μ Pa (peak) (flat) (or 198 dB re 1 μPa^2-s, sound exposure level) The NRC's expert panel assessment (NRC 2005) and further review as discussed by Richardson et al (2011) also supports the Associations' position.

Level B

With respect to the establishment of thresholds for the Application, the Associations note that while some aspects of the MMS 2004 PEA could be updated with new information, the basic premise of the 2004 effort has remained true (see Richardson et al. 2011 for 2004-2011 updates:

A key point is that almost all impacts of seismic surveys have been inferred or assumed by implication rather than observed. There have been no documented instances of deaths, physical injuries, or auditory (physiological) effects on marine mammals from seismic surveys. Behavioral responses have been observed in many instances, primarily in mysticetes [baleen whales]. However, the biological importance of such behavioral responses (i.e., to the individual animals and populations) has not been determined. (page III-9, MMS, 2004).

The level of sound exposure that will induce behavioral responses may not directly equate to biologically significant disturbance; therefore additional consideration must be directed at response and significance (NRC 2005; Richardson et al. 2011). To further complicate a determination of an acoustic Level B take, the animals' surroundings and/or the activity

(feeding, migrating, etc.) being conducted at the time they receive the sound rather than solely intensity may be as important for behavioral responses (Richardson et al 2011).

The Southall Work Group also questioned the relevance of the 160 dB re: 1 µPa disturbance criterion noting that thresholds for odontocetes and pinnipeds exposed to pulsed sounds is not at all well-established …" (Southall et al. 2007, Page 417).

Further, the Marine Mammal Noise Exposure Criteria Work Group recognized that a difference existed between "a significant behavioral response from an insignificant, momentary alteration in behavior." (See also Richardson et al. 2011). The work group went on to propose that "Consequently, upon exposure to a single pulse, the onset of significant behavioral disturbance is proposed to occur at the lowest level of noise exposure that has a measurable transient effect on hearing (i.e., TTS-onset). We recognize that this is not a behavioral effect per se, but we use this auditory effect as a de facto behavioral threshold until better measures are identified.

Factors Impacting Thresholds

Other considerations should be recognized by BOEMRE in establishing thresholds:

- The biological significance of sound may also depend more so on how long the sound persists (Richardson et al. 2011). BOEMRE fails to allow for the fact that 3D seismic surveys (most common) are typically acquired in a racetrack pattern resulting in lower chances of an individual animal being exposed to loud sounds for extended periods of time. In other words, given that the seismic vessel is moving in and out of a localized area and the fact that animals are believed to avoid vessel traffic and seismic sounds, cumulative sound exposure is again likely being overestimated. Seismic operations are most often in timescales of weeks and reduce the possibility of significant displacement since they do not persist in an area for an extended period of time. However, little indication of area-wide displacement exists.

- The revised petition does not consider the fact that many animals avoid vessels regardless of whether they are emitting loud sounds and may increase that avoidance distance during seismic operations (Richardson et al. 2011). Therefore, it should be a reasonable assumption that natural avoidance serves to provide another level of protection to the animals.

- As previously noted, the Application is unclear about what constitutes an incidental taking. Given the MMPA defines Level B takes in the context of behavioral change, not in the context of sound level exposures, or RMS Sound Pressure Levels. It is debatable whether behavioral changes are dose-responses or context-responses. There are also indications that some animals change their behavior in the presence of RMS Sound Pressure Levels of 160 dB or lower; in other cases of exposure to sounds of 160 dB (and higher) there is no evidence of behavioral change. It is neither logical nor reasonable to assume that

every exposure to 160 dB or higher results in a behavioral change of biologically significant impact and that change would represent a Level B take.

- There is also mounting scientific evidence that behavioral reactions are species dependent (Stone and Tasker, 2006) and can vary due to biological and environmental context (Wartzok et al. (2004), Frost et al. (1984) vs Finley et al. (1990), (Richardson et al., 2011; Miller et al., 2005), (Richardson et al., 1999). Most behavioral studies conducted to date have not recorded the received sound pressure levels nor is it clear that sound pressure level (rms) is the best measurement to use for behavioral studies (Southall et al. 2007). In other words, there is not enough scientific evidence to provide a convincing argument that 160 dB should be used as a behavioral "take" criteria. In the base case, it is highly likely, just as the case where 180dB was previously used, that 160dB is overly cautious and results in an exceedingly high number of "takes". Further, as acknowledged by BOEMRE in Section 6, page 24, "Those animals within calculated isopleths of sound above 160 dB re: 1 µPA (rms) are considered a take." This basic rationale (independent of uncertainties in numbers) also likely overestimates actual take numbers (exposure of an animal to a sound is not necessarily equivalent to the animal being taken).

- With reference to BOEMRE's application (Section 5, page 23), "Since it remains unclear that the pulsed, low-frequency sound source resulting from airguns has actually caused injury to marine mammals in open water" (NRC, 2003) or that "marine mammals would not deflect away from sound intensities that could result in injury (MMS, 2004), the potential for injury is considered unlikely, but exposure to 180 dB re: 1 µPA rms or greater is possible." In the paragraph beginning at the end of page 22, the Associations suggest that BOEMRE's revised petition would benefit from similar acknowledgment for Level B that significant behavior effects are also unlikely.

  Industry does not believe 180 dB is the correct threshold for potential injury from multi-pulsed seismic sources. The potential for injury is close to nonexistent at this level. We believe a similar disclaimer of "significant behavioral changes resulting from exposure to sound levels of 160 dB re 1 µPa (rms, unweighted)" should be inserted in the application text in this section.

- Section 6, page 23, states, "This guideline [referring to the 160 dB guideline] does not consider the frequency component and nature of the sound source nor the hearing sensitivities of different cetacean species." Industry recognizes, as does BOEMRE and NMFS, guidelines cannot address every specific detail and factor short of specific guidelines for every specific action. Southall et al (2007) went to great effort to define functional groups in terms of sound sources and marine mammal hearing specialists. Industry is concerned with the use of the antiquated 160 dB guideline for Level B take estimation and, to a great deal, the inability to define a more reasoned criterion rests with an inability to document and quantify marine mammal responses to known sound levels and, more so, what response constitutes a biologically significant effect (NRC 2005). The

Associations strongly encourage NMFS and BOEMRE to consider the frequency component, nature of the sound source, cetacean hearing sensitivities, and biological significance when determining what constitutes a Level B take.

- The 198 dB SEL criterion is mentioned and apparently applied in Appendix A, so it is likely that the Level A takes estimated in Appendix A and quoted in BOEMRE's Table 6.2 (p. 27, left side) were in fact calculated appropriately. However, certain column headings and Tables are unclear. Specifically, the column headings of Table 6.2 and the corresponding Table in Appendix A (Table A-21, p. 77) both refer to an SEL criterion of 215 dB, not 198 dB. Southall et al. proposed a 215 dB SEL criterion as an injury criterion for exposure of cetaceans to non-impulse sounds, and that is not appropriate for seismic surveys with pulsed seismic sources. For those, the appropriate injury criterion is 198 dB SEL. It is likely that Appendix A and the AIM modeling summarized in the left half of Table 6.2 actually did use the appropriate 198 dB SEL criterion, as stated on p. 60 of Appendix A (Table A-19), but the 215 dB SEL value listed in the column headings of the Table A-21 and Table 6.2 is confusing. In the unlikely event that the calculations in Appendix A (and summarized in the left side of Tables A-19 and 6.2) did use the 215 dB SEL criterion as stated in the column heading, then the Level A ("injury") estimates on the left side of Tables 6.2 and A-21 would have been significantly underestimated, and corrected predictions of "Level A takes" would be even more problematic than the values shown.

- The above statements, made in the application, in conjunction with the previously described limitations of the acoustic modeling make it clear that the estimates of potential Level A and B 'takes' in Tables 6-1 and 6-2 are large overestimates. NMFS will need to address this fact of overestimated take numbers in its DPEIS and Draft MMPA Rulemaking. The overestimated take numbers should not be accepted '**as is**.' As mentioned earlier, all of the assumptions in the model and the problems with the current NMFS guidelines for Level A and B takes need to be clearly explained and addressed.

- The BOEMRE request (p. 24, bullet #2) does not adequately describe Southall et al.'s proposed cumulative energy criterion. Southall et al. indicate that, for impulse sounds, any cetacean exposed to either a peak pressure ≥230 dB re 1 µPa or a cumulative sound exposure level (energy) of 198 dB re 1 µPa2 -sec might incur auditory injury. BOEMRE's request (on p. 24) does not mention the second of these dual criteria, which is the one that will almost always (if not always) be the determining factor.

- The BOEMRE request does not make clear whether "M-weighting", as proposed by Southall et al. (2007), was applied in calculating the estimated "takes". Appendix A indicates (p. 60, Table A-19) that the Level A take estimates using the 198 dB (?) SEL criterion did incorporate M-weighting. The phrase "use standard/traditional value" in Table A-19 might mean that M-weighting was not applied when working with those old rms criteria. M-weighting may be justified, as explained by Southall et al. (2007) and to some degree in Appendix A, and

would in fact still be precautionary for both Level A and Level B calculations. That point could have been emphasized in BOEMRE's request, as a further reason why the existing take estimates are overestimates (particularly if no M-weighting was applied). It is important to advance these arguments because, as we understand it, NMFS has not yet publically accepted that M- (or similar) weighting should be applied when estimating takes during seismic surveys. Even if M-weighting was not applied when calculating the numbers of cetaceans that might be exposed to 160 and 180 dB re 1 µPa (rms), it was applied when Level A takes were re-calculated based on the 198 dB (?) SEL energy-based criterion, and the appropriateness of M-weighting need to be emphasized to justify acceptance of those estimates rather than the much larger 180 dB (rms) estimates.

Uncertainty & Layering Precaution / Conservative Factors

Having injected precaution during the noise criteria development stage and once again at the AIM modeling stage coupled with acknowledged gaps in input data about marine mammal populations, distribution, abundance and behavior, it is highly likely that the number of "takes" have has been significantly overestimated.

Therefore, the Associations urge BOEMRE to examine this process and make publically available all scientific uncertainty, assumptions, and precautionary factors applied that are associated with each step of this process such as: 1) estimates of seismic activity, 2) source sizes and characterizations, 3) underwater sound propagation, 4) population estimates and densities of marine mammals, and noise exposure criteria, and 5) marine mammal behavior. The reality is that the model does not reduce but rather expands the rate of error. The greatest risk is that models are not used to provide insight to aid managers in risk assessment decisions but rather are themselves cast as risk assessors. The Associations strongly object to this approach given the lack of precision in the data and the model.

The layering of precaution on top of precaution in every step of the process results in a large overestimate of the numbers of 'takes.'

In Section 6, page 24, the application states, "this basic rationale (independent of uncertainties in numbers) probably overestimates actual take numbers (exposure of an animal to sound is not necessarily equivalent to the animal being taken)." The word "probably" should be deleted. The take estimates in this document are largely overestimated, for several different reasons. For example, the document purports to equate exposure to certain sound levels with a take and uses conservative assumptions within the acoustic modeling.

The above statement regarding the overestimate of take numbers should be highlighted in the application text and on Tables 6-1 and 6-2. Also footnoted on Tables 6-1 and 6-2 should be all the assumptions and data gaps in the model as described in Appendix A. We strongly urge NMFS to address the use of conservative assumptions in the model and how that affects the 'take' estimates. It is imperative that if this model is used, it is clearly explained that it will result in overestimates of takes and therefore, that current mitigation

and monitoring requirements are most likely more than adequate to minimize any 'takes." (See page 24, "Required mitigation and monitoring measures…are therefore considered conservative.")

Modeling Issues:
Industry has identified problems with the (a) acoustic modeling and (b) the AIM Model

Acoustic Modeling

- Selected input parameters/variables could affect the results:
  - The 4,550 cubic inch array used in the acoustic modeling could be considered an average for 2D and perhaps narrow azimuth 3D surveys. In recent years and especially with deep-water WAZ surveys, array sizes have increased. Generally, they now fall between 5000 to 8000 cubic inches.
  - Typical source modeling packages in the industry are only calibrated and therefore only accurate in the seismic band that is below ~200 Hz. This is true of the 'Nucleus' package, which is an industry standard. In BOEMRE's application, modeling of up to 1000 Hz was used so there will likely be significant uncertainty in this extended band. Of equal or greater importance is that much of the useful seismic bandwidth (<50Hz) was not included due to model limitations.
  - The OBS model was run using atypical (one of the most dense) OBS acquisition methods. Source effort was set at a 12.5 meter source activation interval and 6-second record length. In order to maintain proper recharging of source elements with this short source interval would require smaller source arrays than used in the modeling.
  - On standard 3D surveys, AIM's model estimate of survey duration was almost 45% longer compared to a similar survey modeled by a geophysical company (an IAGC member). We can only assume that the model is utilizing a lower capacity 3D vessel; however, if a modern high capacity vessel was used, the exposure time in the survey area would be substantially decreased thus resulting in fewer 'takes.'
- Not only does the model have limitations because of the uncertainty in so many of the input variables and parameters, but in almost all instances the modelers decided to use conservative estimates/assumptions. Once again the layering of precaution on top of precaution in every step of the process results in a large overestimate of the numbers of 'takes.' Below are just a few examples from the acoustic modeling section (Appendix A) which illustrate the use of conservative inputs to the model:
  - "A conservative (precautionary) estimate of this offset between TTS and PTS thresholds, when sound exposure is measured on a sound exposure

level (SEL) basis (received energy levels), is to add 15 dB to the TTS value for impulsive sounds" (page 8, Appendix A)

- "…but also tended to err on the conservative side by using those parameters which resulted in a lesser values of transmission loss (i.e., a higher received level at the modeled animals)" (page 23 Appendix A)
- "Therefore, a conservative value of 0.1 s is used for the signal duration for this analysis..." (Page 10, Appendix A)
- "These seasonal wave height data were applied conservatively (i.e., producing the least TL) for the acoustic propagation modeling." (Page 31, Appendix A)
- "This is a conservative assumption, given that the marine animals that were simulated during the AIM portion of the modeling probably have some directivity for any frequency of sound that they can perceive…" (Page 32, Appendix A)
- "In most cases, this represents a higher density of animats in the simulation (0.1 animats/km2) than occurs in the real environment…This approach should be considered moderately conservative in terms of allowing for more prolonged exposures than would be expected from species with a lower residency factor." (Page 55, Appendix A)
- Additional overestimating occurs within Appendix A such as the assumption of perfect omni-directional receivers (page 32) and the use of winter SVPs to calculate transmission loss (page 33)

AIM "Model" Issues

Use of the AIM model is integral to the BOEMRE assessment of seismic operational impacts on marine life and the mechanism used to develop the number of incidental takes in the revised petition. Unfortunately, the revised petition neither disclosed nor it appears corrected weaknesses identified during the 2006 NOAA contracted external review of the AIM Model conducted by the University of Miami Independent for Peer Review (Miami Peer Review):

- AIM is incorrectly portrayed in the Application as a model. The Miami Peer Review correctly judged that AIM is not a model but rather a "software package" that integrates various sub-models, i.e. acoustic and environmental models. (At page 1)

- AIM does not meet the criteria of the U.S. agencies own minimum standards for models, (At page 1). The Miami Peer Review panel agreed that the use of AIM might lead to models that will meet the Council for Regulatory Monitoring (CREM) guidelines. However, such models, at this stage, would need to be evaluated on a case-by-case basis. There has been no such case-by-case evaluation including use by BOEMRE in its attempt to use AIM to calculate seismic incidental takings for this action.

  The Miami Peer Review assembled by NOAA itself noted that it could not agree that AIM met CREM's requirements (CREM Guidelines at Page 1).

This is not surprising as there were identified problems with both validation and verification. On validation, the review panel noted that AIM had not been validated against marine mammal behavior. On validation, the review panel suggested that AIM should be validated against other government models including the Effect of Sound on The Marine Environment (ESME), a software workbench developed by the Naval Research Laboratory. On verification, issues were identified with the manner in which the AIM builders had verified and documented the accuracy of its code.

- AIM results are neither precise nor 100% accurate.
  AIM at best is an effort to create a mechanized approximate answer. We believe no one knows its accuracy. If AIM's accuracy is known, then a standard error (+/-) should be reported for each of the estimated 'take' numbers. The panel noted the absence of uncertainty tests (At Page 1).

  "The reliability of AIM to assess the exposure hazard of marine mammals to anthropogenic sound is more limited by the realism of the animate engine module of AIM than the sound propagation modules … animal behavior is far more complicated than behavior of physical systems." (Getz 2006).

  "The core weakness in assessing impacts of sound is the lack of knowledge of marine mammal populations. This will improve in the coming decades but policy makers must be aware of the great uncertainty in this area." (At Page 8).

  "… the animal animats are unlikely to behave anything like the real systems because ecological and sociological components of the behavior of individuals are ignored" (Getz 2006). (At Page 11)

- AIM alone is not appropriate for regulatory decision-making.
  The Associations believe it is a misuse of AIM to create and publish what seems to be highly precise incidental take numbers given the acknowledged limitations in both the mechanics of the model and the data that feeds it. If BOEMRE and NMFS proceed with the use of AIM to create take numbers as presented in the petition, then all of the limitations, assumptions and potential for error/uncertainty (as noted above) need to be clearly explained and addressed in the text of the application in the same section where the take numbers are presented. How these limitations, assumptions and uncertainties affected the 'take' estimates (large overestimate) need to be explained. NMFS needs to consider all of these factors in its analysis of the modeling approach and estimated take numbers in the DPEIS and Draft MMPA Rulemaking.

  "There was general agreement that the best available data and models have been incorporated into AIM. However, it was again noted, that the "best available" is not very good in a number of areas." (At Page 9). "The behaviors of real animals … are, for the most part, not well enough

empirically established to have a theoretical basis for implementation" (Getz 2006) (At Page 9). "These adaptations are largely limited by the lack of detailed behavioral data on free-ranging marine mammals." (Thomas 2006).

- Adequate sensitivity and uncertainty analyses were not performed.
  Two panelists (modeling specialists) familiar with statistical modeling in broad biological applications succinctly stated that adequate sensitivity and uncertainty analyses were not performed (Getz 2006). The acoustic expert noted, with regard to providing error bounds on estimates, "that the acoustic modeling community has historically not graduated to this stage either …" There are few restrictions within AIM which would prevent suitable analyses being performed. However, it is abundantly clear that these analyses have not been performed in applications to date. (At Page 11-12)

- Critical improvements were recommended (At Page 12-14):
  Further testing and validation was strongly encouraged. BOEMRE should ensure that AIM performance is compared with a software platform such as ESME over a set of exercises that covers the full range for which AIM is designed to provide assessments (Getz 2006). (At Page 13)

  If the model is to be used for particularly important policy decisions, an investment is needed to benchmark the code and provide transparent documentation that demonstrates better benchmarking has been done. (Porter 2006 at Page 13)

  Additional work was recommended in 2006 but it is not clear as a proprietary sourced model/code whether these steps were taken. Sensitivity studies were recommended to provide error bars on model predictions. Getz (2006).

  The Associations agree and note given this comment that the single species incidental takes numbers should be revised to ranges that reflect the quality of the data, quality of the model and a statistically sound uncertainty analysis. Further, it was recommended by the review panel that critical output should be reported minimally in terms of both averages and confidence intervals. (At Page 13). Finally, the sensitivity of key measures, such as Level A and B takes, to the most uncertain or speculative parameters in the model should be reported. (At Page 13)

<u>Other AIM Issues</u>

There are other issues associated with the way the AIM Model is configured and used:

- It appears that the AIM calculations did not allow for active mitigation measures when the cetaceans were sighted within 500 meters (or some other mitigation distance). It is not clear whether there was any provision for any species of cetaceans. In some other applications of AIM to seismic surveys, allowance for shutdowns has been incorporated, and that reduces the number of predicted Level A takes.

- It would be helpful if the modeling report included specific information about the predicted received levels (both “rms over pulse duration” and SEL) as a function of distance, depth and aspect. Appendix A includes considerable discussion of the Tolstoy et al. (2004, 2009) studies that measured such values for two airgun array designs operating at various water depths in the GoM. However, we did not find specific predictions of the predicted received levels and SEL values for the assumed standard industry airgun array. That information must have been used in the process of estimating the “takes” summarized in Tables A-20 and A-21. That information is critical in developing or assessing any proposed mitigation strategy.

- Appendix A (p. 50) indicates (on p. 50, paragraph 1, 2nd last sentence) that the AIM runs did not allow for avoidance responses by cetaceans approached by the operating seismic sources. It is well established that many (not all) cetaceans exhibit some avoidance upon close approach by an operating seismic source. It would be difficult to allow quantitatively for this, given the lack of specific information about avoidance behavior (and the proportions of cetaceans exhibiting avoidance) in relation to distance from seismic sources, received sound levels, and other circumstances. However, not including any such allowance means that numbers of cetaceans exposed to high-level sounds (e.g., ≥180 dB re 1 µPa rms or especially ≥198 dB re 1 $\mu Pa^2 \cdot$ sec) will be overestimated.

- The Level A takes estimated based on the Southall et al. criterion (presumably ≥198 dB SEL) are based on accumulating SEL over the full duration of each "exercise" [simulation], according to p. 58 (bottom). Those assumed "exercise" durations varied from 3,528 to 16,632 sec (2.45 to 11.55 days), but most often were 10,400 sec = 7.2 days (Table A-13, p. 51). Southall et al. can be read as suggesting that the accumulation should be limited to 24 hours, assuming that (with typical variability in exposure over time during a seismic project) the accumulation should reset to zero after no more than 24 hr because of auditory recovery. If that is appropriate, the SEL exposure estimates in Appendix A are higher than would occur if the “24-hr rule” were applied. However, when seismic operations are confined to a small area and received levels for an animal in that area never diminishes to low or zero values during the operation, the “24-hr rule” may not be appropriate. In that case, received levels might not diminish (during the operation) to low enough values for long enough for auditory recovery to occur. In any case, the approach in Appendix A would appear to be precautionary in this regard.

  The simulation durations in Appendix A for some survey types are somewhat arbitrary and do not correspond to the full duration of the survey as described. For example, for the assumed 3-D survey, the AIM model was run for a 100 × 4.8 km area rather than the 100 × 24 km area that was assumed to be typical of a 3-D survey. Correspondingly, the model was run for a 7.2 d period rather than the 36.7 d period said to be necessary for the full survey.

This would be precautionary if the SEL exposure can be assumed to reset to zero each day, or at least at intervals <7.2 days, which is reasonable. However, it would be non-precautionary if exposure really should be accumulated over the full duration of the survey. The implications of the assumed survey durations do not appear to be addressed in the Appendix or in the main BOEMRE application.

- The assumed survey patterns for each of the five categories of seismic surveys (p. 52–54 of Appendix A) give no information as to the assumed sequence of lines (racetrack vs. sequential), or on the assumed source condition during line changes (silent, mitigation gun, full array). These uncertainties in assumptions probably do not matter much if one accepts the validity of accumulating SEL across the full duration of the simulation, but might matter if the accumulation were limited to 24-hour (or similar) periods.

- Table A-19 makes clear that M-weighting was applied when estimating SEL exposures, but it is unclear as to whether M-weighting was applied when calculating estimated numbers that would be exposed to ≥180 and ≥160 dB re 1 µPa (rms over pulse duration).

- Appendix A does not explicitly stated which species of cetaceans were assumed (when applying M-weighting) to be low frequency, mid-frequency, and high frequency species. In particular, it would be helpful to understand whether pygmy and dwarf sperm whales (*Kogia* spp.) were treated as high-frequency species. In some early pre-publication presentations of the then-proposed Southall et al. approach, *Kogia* spp. were considered to be mid-frequency species, but in the final Southall et al. (2007) paper, they are considered high-frequency species.

Recommendations:

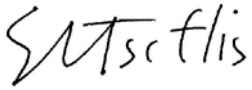
- BOEMRE clearly define what constitutes a take and why and what thresholds will be utilized in the rulemaking
- BOEMRE adopt as its Level A threshold the Southall recommendation of 198 dB re 1 µPa2-s, sound exposure level)
- BOEMRE should for consistency strongly consider adoption of the Southall guidance regarding the distinction between a momentary behavioral reaction and a significant behavioral reaction in establishing its Level B threshold.
- BOEMRE should recognize that sound exposure does not necessarily equal takes. "The basic rationale (independent of uncertainties in numbers) probably overestimates actual take numbers (exposure of an animal to a sound is not necessarily equivalent to the animal being taken)." (Page 24 of application)
- If NMFS accepts BOEMRE's application as is, with the current estimated take numbers, NMFS needs to provide a comprehensive, detailed explanation of all the limitations, assumptions and uncertainty contained in the AIM model which therefore result in an overestimate of incidental takes.

- In the BOEMRE application it should be clearly stated and explained that the approach currently used to estimate takes grossly overestimates takes; therefore, because of this large overestimate which will not be realized in actuality, any recommended mitigation measures should be designed to minimize the actual potential 'takes' and not the overestimate.

We appreciate the opportunity to provide you with these comments.

Sincerely,

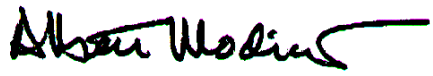
Andy Radford, API



Sarah L. Tsoflias, IAGC

Dan Naatz, IPAA

Michael Kearns, NOIA



Albert Modiano, USOGA

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THE CENTER FOR REGULATORY EFFECTIVENESS' COMMENTS ON BOEMRE'S REVISED APPLICATION FOR TAKE AUTHORIZATIONS FOR OIL AND GAS SESIMIC SURVEYS IN THE GULF OF MEXICO, http://www.nmfs.noaa.gov/pr/pdfs/fr/fr76-34656.pdf , SUBMITTED ON JULY 13, 2011, BY E-MAIL AT ITP.Goldstein@noaa.gov. , AND BY FIRST-CLASS MAIL TO P. MICHAEL PAYNE, CHIEF, PERMITS, CONSERVATION, AND EDUCATION DIVISION, OFFICE OF PROTECTED RESOURCES, NATIONAL MARINE FISHERIES SERVICE, 1315 EAST-WEST HIGHWAY, SILVER SPRING, MD 20910–3225

I. EXECUTIVE SUMMARY

The Center for Regulatory Effectiveness ("CRE") appreciates the opportunity to comment on BOEMRE's Revised Application for Take Authorizations for Oil and Gas Seismic Surveys in the Gulf of Mexico ("2011 Application"). As discussed in more detail below:

Seismic surveys conducted in accordance with long-standing mitigation and monitoring requirements have not harmed marine mammals in the Gulf of Mexico ("GoM").

NMFS' external Peer Review Report for the Acoustic Integration Model ("AIM") recommends that there be additional review each time that Aim is applied. AIM has not yet been peer reviewed for its application in estimating seismic Takes in the GoM.

NMFS' Peer Review Report states that the AIM input data on behavioral effects are inadequate.

BOEMRE's 2011 Application also repeatedly states that adequate input data do not exist for most of the GoM marine mammals that AIM models.

Under these circumstances, CRE requests that NMFS and/or BOEMRE conduct external peer review of AIM's modeling of GoM marine mammal Takes in order to determine whether AIM can be accurately and reliably used by the agencies. This peer review should address, among other issues, whether the behavioral effects data input into the AIM model are adequate for the model to be used to estimate Takes of marine mammals in the GoM.

This peer review should comply with OMB's *Final Information Quality Bulletin for Peer Review*, available online at http://www.whitehouse.gov/sites/default/files/omb/memoranda/fy2005/m05-03.pdf .

The peer reviewers should be advised of the Information Quality Act Guidelines applicable to BOEMRE and NMFS.[1] They should also be advised of EPA's CREM Guidance for models. [2]

NMFS/BOEMRE should also identify in the public record each and every AIM peer review that they believe has occurred.

In the interim, NMFS should issue GoM Take regulations based on BOEMRE's (then MMS) 2004 Take Application to NMFS, available online at http://www.nmfs.noaa.gov/pr/pdfs/permits/mms_gom_seismic_application2004.pdf ("2004 Application"), except that the *Southall Criteria* should be used for Level A Takes because these criteria are more accurate. [3]

That Application is supported by a record which shows no harm to marine mammals from seismic in the GoM.

II. NMFS SHOULD GRANT BOEMRE'S 2004 TAKE APPLICATION

Offshore oil and gas seismic is safe when conducted in accordance with long standing and well known mitigation requirements:

> "In over three decades of world-wide seismic surveying, there is no evidence to suggest that sound from E&P seismic activities has resulted in any physical or auditory injury in any marine mammal species. Nor have research studies and operations monitoring programmes designed to assess the potential impacts from seismic surveys indicated any physical injury, or suggested behavioural effects leading to impacts on the viability of any marine mammal population. That being said, recent studies have shown that marine mammal hearing sensitivity may be temporarily jeopardised if exposed at intense levels such as those encountered very close to an operating seismic sound source. For that reason, seismic surveys are conducted with measures in place designed to protect animals from high exposure levels."[4]

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[1] The BOEMRE IQA guidelines are available online at http://www.boemre.gov/qualityinfo/ . The NOAA/NMFS IQA Guidelines are available online at http://www.nmfs.noaa.gov/quality.htm

[2] EPA's CREM Guidance is available online at http://www.epa.gov/crem/cremlib.html

[3] The *Southall Criteria* are available online at http://thecre.com/pdf/Aquatic%20Mammals%2033%204_FINAL1.pdf

[4] "Seismic Surveys and Marine Mammals, Joint OGP/IAGC Position Paper," International Association of Oil and Gas Producers ("OGP") and International Association of Geophysical Contractors ("IAGC"), available online at http://www.ogp.org.uk/pubs/358.pdf .

The "measures in place" to protect GoM marine mammals are those set forth in BOEMRE's 2004 Take Application.

MMS/BOEMRE and the National Research Council have similarly concluded that

> "there have been no known instances of injury, mortality, or population level effects on marine mammals from seismic exposure but that the potential for these types of impacts may exist without appropriate mitigation measures. The MMS-approved seismic surveys include mitigation measures designed to reduce the potential for effects to occur." [5]

The MMS/BOEMRE "mitigation measures" referenced above are those set forth in BOEMRE's 2004 Take Application.

NMFS itself has correctly pointed out that

> "to date, there is no evidence that serious injury, death, or stranding by marine mammals can occur from exposure to airgun pulses, even in the case of large airgun arrays."[6]

In other words, after years and millions of dollar spent on study, there is no evidence of harm caused by GoM seismic conducted in accordance with the requirements of BOEMRE's 2004 Take application.

NMFS has had BOEMRE's 2004 Take Application for seven years. The BOEMRE's mitigation and monitoring measures set forth in the 2004 application adequately protect marine mammals in the GoM. There is no record supporting a contrary conclusion or showing harm from seismic in the GoM. NMFS' failure to grant BOEMRE's 2004 Take Application is inexplicable and inexcusable.

[5] See, *e.g.*, Outer Continental Shelf Oil & Gas Leasing Program,2007-2012 Final Environmental Impact Statement, page V-64 (MMS April 2007), *available online at* http://www.boemre.gov/5-year/2007-2012DEIS/VolumeII/5and6-ConsultationPreparers.pdf

[6] 75 FR 49795-96 (Aug. 13, 2010), *available online at* http://edocket.access.gpo.gov/2010/2010-19962.htm .

III. AIM NEEDS TO BE PEER REVIEWED BEFORE IT IS USED TO ESTIMATE TAKES OF MARINE AMMALS FROM OIL AND GAS SEISMIC IN THE GOM

The primary differences between the 2004 and 2011 Applications are the 2011 Application's use of the *Southall Criteria* and its use of AIM .[7]

AIM is essential to the 2011 Application. The modeling appendix to the 2011 Application explains that:

> "[T]he acoustic modeling effort involved two main steps: (1) physical acoustic modeling to predict the three dimensional (3-D) underwater sound field around airgun sources; and (2) use of a second model to determine and correctly interpret the exposure of marine animals exposed to that sound field. The Acoustic Integration Model (AIM) will be used to complete the second step…."
>
> ***
>
> "The second step requires knowledge of the diving and movement characteristics of the animals residing in the exposed region. Time-based integration models, such as the Acoustic Integration Model (AIM), as used in this modeling effort, are necessary to fully evaluate the exposure." [8]

AIM has not been peer reviewed for the specific application of estimating Takes of marine mammals from oil and gas seismic in the GoM. However, NMFS previously had AIM peer reviewed for its use in general.[9] NMFS' external peer review concluded that the input data for AIM are inadequate and that AIM should be peer reviewed again whenever it is applied in a specific context.

The AIM peer review report states in part as follows:

> "The three terms of reference required that the Panel evaluate whether AIM correctly implements the models and data upon which it is based; whether animal movements are

[7]The *Southall Criteria* for Level A takes should be substituted for the Level A criteria used in BOEMRE's 2004 Take Application because the *Southall* Level A criteria are clearly more accurate and reliable.

[8] 2011 Application, Appendix A, *Acoustic Modeling Approach and Methodology*, pages 22 and 3 (foornote omitted), available online at http://www.nmfs.noaa.gov/pr/pdfs/permits/boemre_appendixa.pdf .

[9] See the AIM peer review report available online at http://www.nmfs.noaa.gov/pr/pdfs/permits/lfa_aim_review.pdf

adequately simulated; and whether AIM meets the Council for Regulatory Monitoring (CREM) guidelines for model development and evaluation.

The Panel agreed that AIM appears to be correctly implemented. However, all panelists had recommendations for further testing to be undertaken. They also agreed that animal movement appears to be appropriately modeled within AIM **given the inadequacies of the available data.**

With regard to whether AIM satisfies the CREM guidelines there was some diversity of opinion. This is understandable given that **the CREM guidelines are not *directly* applicable to AIM since it is not an application model (but a tool for developing such models).**

One of the requirements of the CREM guidelines is for the "model" to have undergone "adequate" peer review. The panelists were split on this question. NMFS clearly thought that an independent peer review was required and hence they initiated this review. The Panel have now reviewed AIM (in what appears to be the first independent peer review), but it is not for them to judge whether their review was an "adequate peer review". The Panel did agree that the principles of credible science had been addressed during the development of AIM. **They agreed that AIM is a useful and credible tool for developing application models.** The need for expertise in the use of AIM was noted (e.g., in the choice of transmission loss model); **as was the absence of appropriate uncertainty and sensitivity tests in the current applications of AIM. It follows, that the Panel agree that the use of AIM can lead to models which will meet the CREM guidelines. However, such models, at this stage, would need to be evaluated on a case-by-case basis (i.e., merely using AIM is not sufficient; it must be used appropriately for the specific application).** [10]

The Peer Review Panel did not conclude that AIM accurately simulates marine mammal behavioral responses to seismic or any other sound. On the contrary, the Panel qualified its report:

"It was generally agreed by the Panel that the animal movement methods used in AIM were appropriate **given the level of available data. The qualifier is important here.** The Panel did not perceive a problem with AIM's animal movement methods. **They do acknowledge a problem with the absence of the type of data needed to realistically simulate animal movement within AIM**." [11]

The woeful inadequacy of AIM's knowledge base is further demonstrated by the discussion of AIM in the 2011 Application. For example,

[10] *Id.* at page 1(emphasis added).

[11] *Id.* at pages 6-7 (emphasis added).

"2.6.6 Animal Behavior Parameters
The specific animal behavioral parameters that were used in this analysis are provided below. Where the "Surfacing/Dive Angle" column is empty, there were no meaningful data available and, as such, 75º was used as a default value…[12]

There were "no meaningful data available," and "75º" was used as AIM's default value, for the vast majority of marine mammals modeled: *i.e.*, beaked whales; dwarf and pygmy sperm whales; blackfish: false killer whale, pygmy killer whale, melon-headed whale, and pilot whale; killer whales: Risso's dolphin; bottlenose dolphin; stenella: spinner, atlantic/pantropical spotted, and striped dolphins; fraser's dolphin; and rough toothed dolphin.

The 2011 application candidly acknowledges many other inadequacies in the data that AIM uses to model behavioral effects on specific marine mammals in the GoM. For example:

"Bryde's W hale
There is a paucity of data for this species. Since they are similar in size, data for both sei and Bryde's whales have been pooled to derive parameters. Note that Sei whales are rare in the Gulf of Mexico, but their similarities to Bryde's whales was used to determine some of their movement parameters.

"Surface Time
No direct data available, fin whale values used.
Dive Depth
No direct data available, fin whale values used." [13]

***

"Beaked W hales
Data on the behavior of beaked whales are sparse. Therefore, all beaked whale species have been pooled into a single animat"[14]

***

"Dwarf and Pygmy Sperm Whales (Kogia spp.)
Data on dwarf and pygmy sperm whales are rare, and these species are very similar, so data for these two species have been combined."[15]

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[12] 2011 Application, Appendix A at page 61, available online at http://www.nmfs.noaa.gov/pr/pdfs/permits/boemre_application2011.pdf

[13] *Id* at page 61.

[14] *Id.* at page 64.

[15] *Id*. at page 65.

***

"Blackfish: False K iller Whale, Pygmy Killer Whale, Melon-headed Whale, Pilot Whale
Studies describing the movements and diving patterns of these animals are rare and sparse. Therefore, they have been combined into a single "blackfish" category. As more data become available, these species will be split into separate animats"[16]

***

"K iller Whale
There is a remarkable paucity of quantitative data available for killer whales, considering their coastal habitat and popular appeal. Nevertheless, most data from "blackfish" were used to model *Orcinus orca*, with the exception of dive depth. The different feeding ecology of these species makes very deep dives apparently unnecessary. When additional data allow, separate animats for "resident" and "transient" killer whales will be developed."[17]

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"Risso's Dolphin
Dive Time
No data on dive times could be found. The values for blackfish, which have a similar ecological niche, were used."[18]

***

"Rough toothed dolphin
Dive Depth
No dive depth data are available; depths are based upon other species."[19]

The *Southall Criteria*, another new aspect of the 2011 application, also emphasize the paucity of data on marine mammal behavioral effects. For example:

"[T]he available data on behavioral responses do not converge on specific exposure conditions resulting in particular reactions, nor do they point to a common behavioral

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[16] *Id* at page 66.

[17] *Id*. at page 68.

[18] *Id* at page 70.

[19] *Id*. at page 74.

mechanism. Even data obtained with substantial controls, precision, and standardized metrics indicate high variance both in behavioral responses and in exposure conditions required to elicit a given response. It is clear that behavioral responses are strongly affected by the context of exposure and by the animal's experience, motivation, and conditioning. This reality, which is generally consistent with patterns of behavior in other mammals (including humans), hampered our efforts to formulate broadly applicable behavioral response criteria for marine mammals based on exposure level alone."

***

"One challenge in developing behavioral criteria is to distinguish a significant behavioral response from an insignificant, momentary alteration in behavior. For example, the startle response to a brief, transient event is unlikely to persist long enough to constitute significant disturbance. Even strong behavioral responses to single pulses, other than those that may secondarily result in injury or death (e.g., stampeding), are expected to dissipate rapidly enough as to have limited long-term consequence."

***

"The inability to identify broadly applicable, quantitative criteria for behavioral disturbance in response to multiple-pulse and nonpulse sounds is an acknowledged limitation."[20]

If *Southall* cannot "identify broadly applicable, quantitative criteria for behavioral disturbance in response to multiple-pulse and nonpulse sounds," then how can AIM model those behavioral disturbances?

IV. REQUESTED ACTIONS

● NMFS should issue regulations under the Marine Mammal Protection Act ("MMPA") establishing Take authorizations for oil and gas seismic surveys in the GoM. These Take authorizations should be issued as soon as possible.

●These Take authorizations should be based on the Take estimates and mitigation provisions in the BOEMRE'S 2004 Application, available online at http://www.nmfs.noaa.gov/pr/pdfs/permits/mms_gom_seismic_application2004.pdf , except that the *Southall Criteria* should be used for Level A Takes because these criteria are more accurate.

[20] *Southall Criteria* at pages 411-414, available online at http://thecre.com/pdf/Aquatic%20Mammals%2033%204_FINAL1.pdf

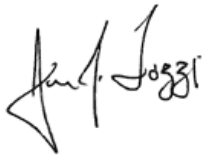
● BOEMRE or NMFS should externally peer review AIM before AIM is used as the basis of any Take authorizations for the GoM. This peer review should comply with OMB's Final Information Quality Bulletin for Peer Review, available online at http://www.whitehouse.gov/sites/default/files/omb/memoranda/fy2005/m05-03.pdf . This peer review should address, among other issues, whether the behavioral effects data input into the AIM model are adequate for the model to be used to estimate Takes of marine mammals in the GoM.

●The peer reviewers should be advised of the Information Quality Act Guidelines applicable to BOEMRE and NMFS.[21] They should also be advised EPA's CREM Guidance for models. [22]

● NMFS/BOEMRE should identify in the public record each and every AIM peer review that they believe has occurred.

We once again thank you for the opportunity to submit these comments, and we look forward to the agencies' responses to them.

Respectfully Submitted,



Jim Tozzi
Member, Board of Advisors

[21] The BOEMRE IQA guidelines are available online at http://www.boemre.gov/qualityinfo/ . The NOAA/NMFS IQA Guidelines are available online at http://www.nmfs.noaa.gov/quality.htm

[22] EPA's CREM Guidance is available online at http://www.epa.gov/crem/cremlib.html

14 July 2011

Mr. P. Michael Payne, Chief
Permits, Conservation and Education Division
Office of Protected Resources
National Marine Fisheries Service
1315 East-West Highway, Room 13635
Silver Spring, MD 20910

Dear Mr. Payne:

The Marine Mammal Commission, in consultation with its Committee of Scientific Advisors on Marine Mammals, has reviewed the National Marine Fisheries Service's 14 June 2011 *Federal Register* notice (76 Fed. Reg. 34656) and the revised application submitted by the Bureau of Ocean Energy Management, Regulation, and Enforcement (the Bureau). The applicant is seeking issuance of regulations under section 101(a)(5)(A) of the Marine Mammal Protection Act to authorize the taking of small numbers of cetaceans incidental to oil and gas industry-sponsored seismic surveys for geological and geophysical exploration on the Outer Continental Shelf in the Gulf of Mexico. The activities would occur during a five-year period. The Service is considering whether to propose regulations that would authorize such taking and is inviting public comment regarding the Bureau's application. The applicant applied for a similar authorization for activities in the Gulf on 3 March 2003, but no regulations were proposed. On 18 April 2011, the Bureau submitted a revised application for authorization to take marine mammals incidental to seismic surveys to be conducted on the Outer Continental Shelf in the Gulf. The Commission commented on the previous request for an incidental take authorization on 3 April 2003, agreeing that the Service's intent to propose regulations to govern incidental taking by seismic surveys was appropriate.

RECOMMENDATIONS

Based on its review of the information provided, the Marine Mammal Commission recommends that, in the proposed rule, the National Marine Fisheries Service—

- provide sufficient justification for its selection of the appropriate threshold for Level A harassment in the proposed rule, regardless of which threshold is adopted;
- verify whether the Bureau is in fact requesting authority to take cetaceans by Level A harassment;
- verify whether geotechnical soil surveys are part of the proposed action and, if so, include in the proposed rule an estimate of the number and types of takes associated with the dynamic positioning system of the survey vessel;
- if the sound sources are considered continuous sources, use the threshold of 120 dB re 1 µPa (rms) rather than 160 dB re 1 µPa (rms) for estimating Level B harassment takes, which is based on Service precedent;
- identify activity-specific Level A and B harassment zones in the proposed rule—those zones should be based on acoustic modeling and/or empirical data and, if based on modeling, should be updated after in-situ measurements have been made and estimated sound pressure

- levels have been verified; and in-situ measurements should be made for all airgun configurations, the sub-bottom profiler, and geotechnical soil surveys at the onset of each activity and adjustments regarding the harassment zones should be made accordingly;
- include in the proposed rule a requirement that the Bureau use the same Level A harassment zone to initiate the shut-down of activities regardless of what species of marine mammal is detected within that zone;
- include power-down requirements in the proposed rule and supplement the mitigation measures proposed by the Bureau to include speed reduction and course alteration requirements and restrictions on the timing or location of activities to avoid disturbing marine mammals during breeding or calving seasons;
- include a requirement in the proposed rule that passive acoustic monitoring be used to collect data on the occurrence, abundance, distribution, and movement of marine mammals during periods before, during, and after all of the proposed activities (i.e., use of airguns and other sound sources and transits and dynamic positioning of vessels), and that the Bureau and/or operators report and analyze those data;
- advise the Bureau of the need to work jointly with industry operators to consider, and potentially fund, the testing of new technologies (i.e., unmanned aerial or underwater vehicles) for use in far-field monitoring; and
- require the Bureau to report immediately all injured and dead marine mammals in the vicinity of the proposed surveys to the Service and to suspend those activities if a marine mammal is seriously injured or killed and the injury or death could have been caused by those activities (e.g., a fresh dead carcass is found).

RATIONALE

Before issuing an incidental take authorization under section 101(a)(5)(A) of the Marine Mammal Protection Act, the Service is required to determine that the taking will have a negligible impact to the species or stocks. Further, the Service is required to determine that the permissible methods of taking and requirements pertaining to the mitigation, monitoring, and reporting of such taking have been structured to effect the least practicable adverse impact on marine mammal species and stocks. The Service has yet to make the required determinations. The Bureau anticipates that the proposed seismic surveys (i.e., 2-D, 3-D, wide azimuth, ocean bottom, and high-resolution surveys) would result in both Level A and B harassment, but would not result in the death of any marine mammal due, in part, to its proposed mitigation and monitoring measures. It is unclear if the Bureau is seeking authority to take marine mammals by Level A harassment or whether it believes implementation of the proposed mitigation and monitoring measures would avoid such takes. The proposed mitigation and monitoring measures (i.e., ramp-up and shut-down procedures based on visual monitoring by trained observers and the optional use of passive acoustic monitoring) are the same as the current mitigation and monitoring measures that have been used by the Bureau in the Gulf since December 2005. Those measures primarily focus on sperm whales, the species of greatest concern when the measures were originally adopted.

Estimation of Takes

The Bureau used the Service's Level A and B harassment thresholds of 180 and 160 dB re 1 μPa (rms), respectively, to estimate the number of takes that would result from the proposed surveys during a five-year period. The Bureau also used the injury threshold of 230 dB re 1 μPa (peak) from Southall et al. 2007 as an alternative basis for estimating the number of takes by Level A harassment. It is unclear which threshold ultimately will be used by the Service to estimate the number of takes by Level A harassment. Regardless of which threshold is adopted, the Marine Mammal Commission recommends that the National Marine Fisheries Service provide sufficient justification for its selection in the proposed rule. The Marine Mammal Commission further recommends that the Service verify whether the Bureau is in fact requesting authority to take cetaceans by Level A harassment.

The application does not clearly indicate whether geotechnical soil surveys are part of the proposed activities that would be conducted in the action area and, if so, whether they would be covered under the requested incidental take authorization. If so, the number of anticipated takes of marine mammals needs to be estimated for those activities that include dynamically positioning the vessel, as was done for industry operators in the Chukchi Sea. The Marine Mammal Commission therefore recommends that the National Marine Fisheries Service verify whether geotechnical soil surveys are part of the proposed action and, if so, include in the proposed rule an estimate of the number and types of takes associated with the dynamic positioning system of the survey vessel. Those sound sources may be considered continuous sources, and if so, based on Service precedent, the threshold for estimating takes by Level B harassment should be120 dB re 1 μPa (rms) rather than 160 dB re 1 μPa (rms).

Mitigation and Monitoring

Until the Service can estimate with confidence the size of appropriate Level A and B harassment zones and the number of associated takes, it lacks a sound basis for making the determinations required under the Marine Mammal Protection Act — i.e., that only small numbers of marine mammals would be taken and that the takes would have a negligible impact on the affected species and stocks. The Level A and B harassment zones were not specified in the Bureau's application. However, it did indicate that it would require that activities be shutdown if a whale (other than a "whale" species in the Delphinidae family) is detected within 500 m of the vessel. The basis for establishing the 500-m safety zone is unclear, as is the basis for requiring shutdown only when whales are present. As such, the Marine Mammal Commission recommends that the National Marine Fisheries Service identify activity-specific Level A and B harassment zones in the proposed rule. Those zones should be based on acoustic modeling and/or empirical data and, if based on modeling, should be updated after in-situ measurements have been made and estimated sound pressure levels have been verified. In-situ measurements should be made for all airgun configurations, the sub-bottom profiler, and geotechnical soil surveys at the onset of each activity and adjustments regarding the harassment zones should be made accordingly. Industry operators have used in-situ measurements to verify and adjust harassment zones in other regions, and this would be appropriate in the Gulf as well. In addition, the Commission recommends that the Service

include in the proposed rule a requirement that the Bureau use the same Level A harassment zone to initiate the shut-down of activities regardless of what species of marine mammal is detected within that zone.

The application does not indicate that power-down would be used as a mitigation measure for the proposed activities. Such procedures are generally included as part of the mitigation measures that the Service adopts for all industry operators. The Bureau has proposed mitigation and monitoring measures that have been used in the Gulf since 2007. Unfortunately, those measures are outdated and not consistent with the measures currently employed by industry operators in other regions. The Marine Mammal Commission recommends that the National Marine Fisheries Service include power-down requirements in the proposed rule and supplement the mitigation measures proposed by the Bureau to include speed reduction and course alteration requirements and restrictions on the timing or location of activities to avoid disturbing marine mammals during breeding or calving seasons.

The Bureau's proposed mitigation and monitoring measures are based exclusively on vessel-based visual monitoring. In addition, it states that it will encourage the use of passive acoustic monitoring on a voluntary basis. Here again, these measures are not consistent with measures currently employed by industry operators in other regions. The Commission supports the use of passive acoustic monitoring and believes that it should be mandatory because it is an effective supplement to visual monitoring when marine mammals vocalize. . Therefore, the Marine Mammal Commission recommends that the National Marine Fisheries Service include a requirement in the proposed rule that passive acoustic monitoring be used to collect data on the occurrence, abundance, distribution, and movement of marine mammals during periods before, during, and after all of the proposed activities (i.e., use of airguns and other sound sources and transits and dynamic positioning of vessels), and that the Bureau and/or operators report and analyze those data.

The use of aerial surveys also could supplement vessel-based visual monitoring, especially for far-field monitoring. However, some operators consider aerial surveys unsafe because some surveys would be conducted too far from land if an emergency occurs. If manned aerial surveys are not practicable, the Bureau and industry should investigate other methods of far-field monitoring (i.e., unmanned aircraft or unmanned underwater vehicles). The Commission believes that those technologies could be feasible for future industry activities, but that the technologies or constraints on using those technologies (e.g., Federal Aviation Administration requirements) have not been fully assessed. As such, the Marine Mammal Commission recommends that the National Marine Fisheries Service advise the Bureau of the need to work jointly with industry operators to consider, and potentially fund, the testing of new technologies (i.e., unmanned aerial or underwater vehicles) for use in far-field monitoring.

Level A Harassment and Mortality

As stated previously, it is unclear if the Bureau is seeking authorization to take marine mammals by Level A harassment. In particular it is not clear if authorization for serious injury is

being sought, inasmuch as the Bureau is not seeking authorization for any mortalities. The application does not specify whether the Bureau intends to report all injured or dead marine mammals in the vicinity of authorized operations to the Service. Again, such a reporting requirement is considered a standard monitoring measure and it is unclear why it was not included in the application. Therefore, the Marine Mammal Commission recommends that the National Marine Fisheries Service require the Bureau to immediately report to the Service all injured and dead marine mammals in the vicinity of the proposed surveys, and to suspend those activities if a marine mammal is seriously injured or killed and the injury or death could have been caused by those activities (e.g., a fresh dead carcass is found). The Service should investigate any such incident to assess the cause and full impact (e.g., the types of injuries, the number of animals involved) and to determine what modifications in survey or other procedures are needed to avoid additional injuries or deaths. Full investigation of such incidents is essential to provide information regarding the potential impact of seismic surveys on marine mammals.

Please contact me if you have questions concerning the Commission's recommendations or comments.

Sincerely,

Timothy J. Ragen, Ph.D.
Executive Director

References

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