



**Marine Mammal  
Commission**

An independent agency of the U.S. Government

# Survey of Federally-Funded Marine Mammal Research and Conservation



**Fiscal Year 2014**

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# Marine Mammal Commission

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## Executive Summary

Title II of the Marine Mammal Protection Act (MMPA) created the Marine Mammal Commission and directed it to undertake a continuing review of “research programs conducted or proposed to be conducted under the authority of the Act.” In 2010 the Commission initiated an online survey to assess funding for marine mammal research and conservation activities conducted or funded by federal agencies in fiscal year 2009. Following the fiscal year 2009 survey the Commission concentrated on revisions to the survey and web-based survey tool.<sup>1</sup> In the spring of 2015, the Commission requested that federal agencies provide data on marine mammal activities from fiscal year 2014 using the new online survey. The survey collected information on the agencies’ marine mammal-related programs, projects, and grants, including the nature of the research, the species and geographic areas studied, the threats and issues addressed, and the funding amounts obligated during that fiscal year. Agencies reported their fiscal data to the survey in two ways: 1) total funding for marine mammals, including direct expenditures for projects and miscellaneous marine mammal activities, as well as the indirect expenditures to support the projects and other activities; 2) direct project expenditures.

Agencies within the Departments of Commerce, Interior, Defense, Homeland Security, Energy, and Health and Human Services, and the National Science Foundation and Marine Mammal Commission reported a combined total of \$134.3 million (M) (Figure 1). Those funds included \$91.7 M in direct expenditures associated with 504 projects, and \$42.7M associated with direct expenditures for other marine mammal activities and support and the indirect costs with the project and other direct expenditures. The Department of Commerce’s NOAA Fisheries, which has lead responsibility for research and management of cetaceans, seals, fur seals, and sea lions, accounted for 49 percent of all federal funding for marine mammals (\$66.M). The Department of the Interior’s U.S. Geological Survey and U.S. Fish and Wildlife Service, which have lead responsibility for research and management (respectively) of the West Indian manatee, polar bear, sea otter, and walrus, provided an additional five percent each (\$6.7M and \$6.5M, respectively). Together, these three agencies, which have lead responsibility for the conservation of all marine mammals, accounted for 59 percent (\$79.4M) of the total funding reported. The Department of Defense (Navy, Army Corps of Engineers), Department of Energy, Department of Interior (Bureaus of Ocean Energy Management, and Safety and Environmental Enforcement), and Department of Homeland Security (U.S. Coast Guard), all of which are responsible for mitigating the impact of their activities and policies affecting marine mammals, accounted for 32 percent (\$42.6M) for research and mitigation efforts. Other sources of funds included NOAA’s National Ocean Service (3 percent, \$4.2M), the Marine Mammal Commission (2 percent, \$3.3M), the Department of Defense’s Environmental Research Programs (2 percent, \$2.1M), the National Science Foundation (1 percent, \$1.1M), NOAA Research (<1 percent, \$0.8M), the National Institutes of Health (<1 percent, \$0.6M), and the National Park Service (<1 percent, <\$0.1M).

Funding differed substantially by region. NOAA Fisheries allocated 43 percent (\$24.3M) of its region-specific funding to the Alaska Region, 18 percent (\$10.1M) to the West Coast Region, 16 percent (\$9.2M) to the Greater Atlantic Region, 12 percent (\$6.5M) to the Pacific Islands Region, and 11 percent (\$6.2M) to the Southeast Region. The U.S. Fish and Wildlife Service and the U.S. Geological Survey distributed their funds

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<sup>1</sup> A survey was run in 2012 for fiscal years 2010 and 2011, but due to personnel and budgetary shortages the survey was not published.

largely in proportion to the marine mammal species they manage and study: 57 percent (\$7.4M) went to the Alaska Region for the polar bear, walrus, and northern sea otter; 21 percent (\$2.9M) to the Southeast Region for the West Indian manatee; and eight percent (\$1.0M) to the West Coast Region for the southern sea otter. Although regional boundaries used by NOAA Fisheries and the U.S. Fish and Wildlife Service / U.S. Geological Survey differ somewhat, and 15 percent of their combined funding (\$11.6M) was provided to programs not tied to specific regions, these agencies allocated approximately 40 percent (\$31.8M) of their combined \$79.4M in funding for work based in Alaska, 14 percent (\$11.1M) in the contiguous Pacific coast states (i.e., Washington, Oregon and California), 12 percent (\$9.3M) in northeastern and mid-Atlantic coastal states, 11 percent (\$9.1M) in the southeastern and Gulf of Mexico states, and eight percent (\$6.5M) in the Pacific Islands Region. The dispersal of funds by the Department of Defense and Bureau of Ocean Energy Management also varied by region, reflecting the distribution of their activities or leasing programs. However, percentages by region were less clear-cut.

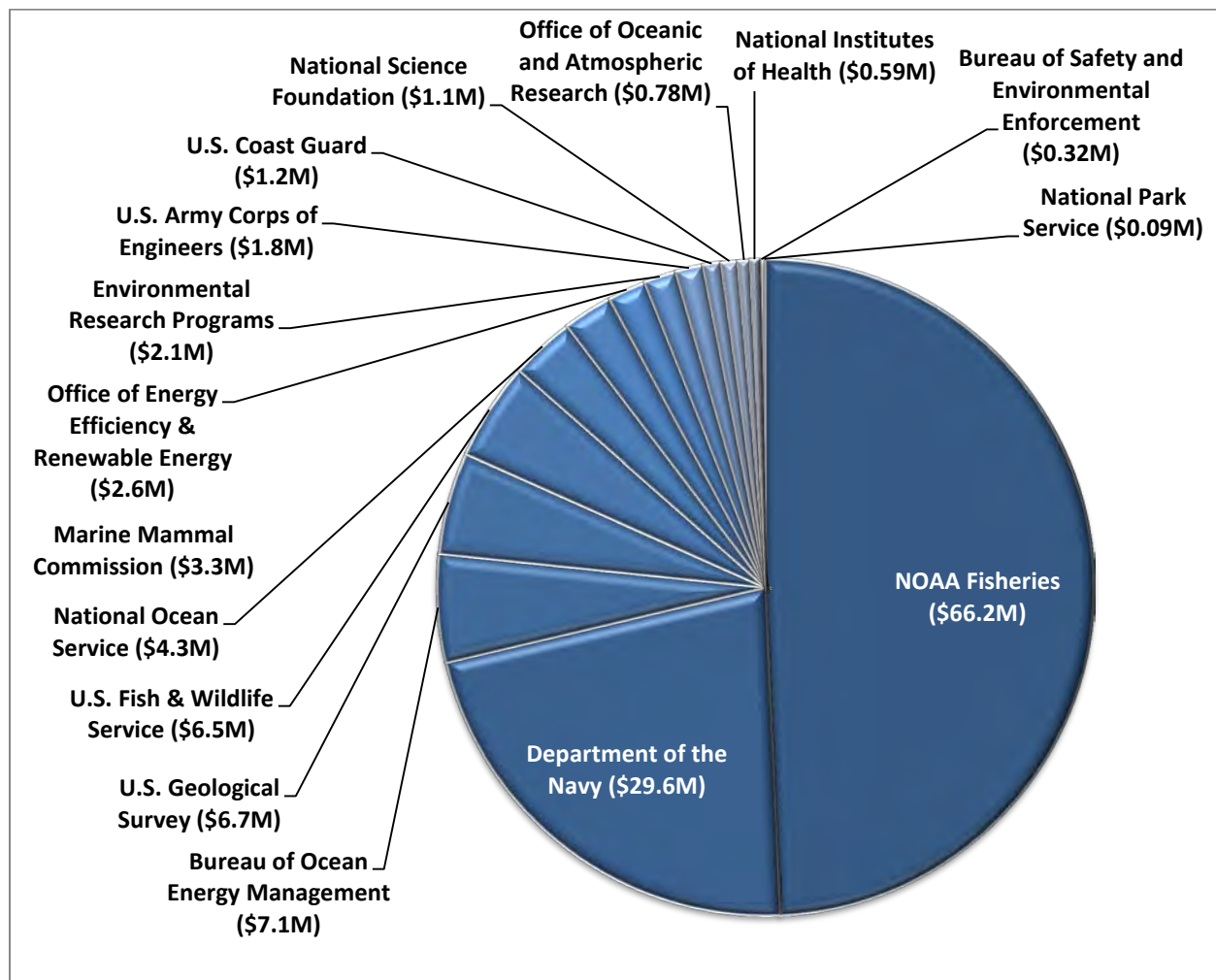


Figure 1. Fiscal year 2014 total funding reported by agencies.



Of the \$92.5M in direct expenditures reported by all agencies combined for 504 projects, 25 percent (\$22.9M) was focused on population dynamics and stock assessment, 25 percent (\$23.1M) on studies of marine mammal biology and ecology, 15 percent (\$13.9M) on conservation and policy, and 13 percent (\$11.6M) on technology development. Federal agencies also directed 11 percent (\$9.9M) of the total direct project expenditures toward projects related to the impact of human activities such as sound, military activities, fishing, pollution, and tourism. They also directed eight percent (\$7.2M) to animal health, and four percent (\$3.9M) to communications, outreach and meetings.

Among the 504 projects (\$92.5M in direct project expenditures), agencies directed approximately \$86.8M in direct expenditures to projects focused on one or more of 110 individual marine mammal species reported in the survey. The remaining \$5.8M in direct project expenditures were of general benefit to all marine mammals (e.g., technology development, or general conferences). Nearly 44% of the \$86.8M, (\$38.1M) was spent on nine species (humpback whale, Steller sea lion, North Atlantic right whale, walrus, Hawaiian monk seal, Atlantic bottlenose dolphin, polar bear, fin whale, and bowhead whale), which received amounts varying from approximately \$6.7M to \$3.3M each. Expenditures for an additional 20 species that exceeded \$1.0M accounted for another 37 percent (\$32.3M) of the \$86.8M.

When the projects are broken down according to broad taxonomic or ecological groups, 11 species of pinnipeds<sup>2</sup> received \$500 thousand (K) or more in direct expenditures (Steller and California sea lions; northern fur seals; Hawaiian monk, harbor, bearded, northern elephant, ribbon, ringed, and spotted seals; and walrus) for a total of 29 percent (\$24.8M) of the \$86.8M. Using the same funding cut-off, nine species of large whales (humpback, North Atlantic right, fin, bowhead, blue, gray, minke, sperm and sei) accounted for 30 percent (\$26.1M) of the expenditures. Direct expenditures for more than 16 species of toothed cetaceans<sup>3</sup> (Cuvier's, Baird's and Blainville's beaked whales, Northern bottlenose whales, Atlantic bottlenose dolphins; killer, beluga, sperm whales<sup>4</sup>; pilot whales,<sup>5</sup> several species of small ocean dolphins, and harbor porpoise) exceeded the cut-off and accounted for another 22 percent (\$19.1M).

Of the direct project expenditures associated with particular species (\$86.8M), agencies directed 66 percent (\$57.3M) toward 30 species listed as endangered or threatened under the Endangered Species Act (ESA), or designated as depleted or categorized strategic under the MMPA. Of the \$57.3M, agencies directed 67 percent (\$38.6M) toward 20 endangered species, 16 percent (\$9.3M) toward seven threatened species, 11 percent (\$7.7M) toward two strategic species,<sup>6</sup> and 2 percent (\$1.8M) toward the single species designated as depleted.<sup>7</sup> Of the 27 species listed as endangered or threatened, expenditures averaged \$1.8M (range: \$893K to \$6.7M) for the 18 species with the highest expenditures, all of which occur in U.S. waters. Expenditures for the other nine species averaged \$65K (range: \$460K - \$242K). Just two of the nine species, North Pacific right whale (\$228K) and Guadalupe fur seal (\$65K), occur in U.S. waters.

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<sup>2</sup> Seals, sea lions, fur seals, and walrus are all pinnipeds

<sup>3</sup> Toothed whales, dolphins and porpoises – the odontocetes

<sup>4</sup> Sperm whale, pygmy sperm whale and dwarf sperm whale

<sup>5</sup> Long-finned and short-finned pilot whales

<sup>6</sup> Designated strategic under the MMPA, but not listed under the ESA

<sup>7</sup> Designated as depleted under the MMPA, but not listed under the ESA or designated as strategic under the MMPA

Survey respondents identified the geographic regions (coastal Large Marine Ecosystems (LMEs) and large open ocean areas) within which each project operated or was relevant to the project. The U.S. Arctic LMEs<sup>8</sup> and adjacent areas accounted for 31 percent (\$25.4M) of the total direct project expenditures associated with one or more particular regions (\$83.3M). Expenditures in the Pacific Ocean LMEs<sup>9</sup> made up 43% of the total. Expenditures in the Northeast U.S. Continental Shelf LME and its adjacent open ocean area accounted for another 15 percent (\$12.8M). The Southeast U.S. Continental Shelf, Gulf of Mexico and Caribbean LMEs combined accounted for 11 percent (\$9.2M) of the direct project expenditures.

The Marine Mammal Commission gratefully appreciates the time and effort contributed by respondents from all federal agencies participating in the survey. The Commission acknowledges comments from respondents, which have improved the survey and its usefulness substantially. Additional comments on this report are welcome and should be submitted to the Commission at [surveyffr@mmc.gov](mailto:surveyffr@mmc.gov).

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<sup>8</sup> Chukchi Sea, Beaufort Sea, East Bering Sea and West Bering Sea LMEs

<sup>9</sup> Northeast and northwest Pacific Ocean, California Current, Gulf of Alaska, and Insular Pacific – Hawaiian LMEs

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## Introduction

Title II of the Marine Mammal Protection Act of 1972 (MMPA) directs the Marine Mammal Commission to conduct a continuing review of “...research programs conducted or proposed to be conducted under the authority of the Act....” From 1974 to 2000, the Commission fulfilled that duty, in part, by conducting an annual “Survey of Federally Funded Marine Mammal Research and Studies.”<sup>10</sup> The Commission discontinued the survey in 2000 because of uncertainties as to whether the results were being used. In 2010 the Commission re-initiated the survey – now entitled the “Survey of Federally Funded Marine Mammal Research and Conservation” – to analyze data for fiscal year 2009.<sup>11</sup>

Following the fiscal year 2009 survey the Commission undertook a large-scale revision of the survey and the web-based survey tool.<sup>12</sup> The redesign has enabled the collection of high quality data, and the new web-based survey tool has allowed participating agencies to enter their data quickly and efficiently. The Commission considers the survey an important source of information to inform decision-makers charged with evaluating and prioritizing resources needed to meet marine mammal research and conservation obligations.

The survey was designed to gather funding information from federal agencies<sup>13</sup> regarding their marine mammal research and conservation activities. Research may occur in the field, in a laboratory, or at a captive facility and may involve the surveying of wild populations, collection of biological samples, data analyses, computer simulations, or integration of traditional Native American knowledge. Topics may include anatomy, morphology, physiology, nutrition, metabolism, energetics, genetics, neurology, hearing, sound production, echolocation, dive physiology, cognition, parasitology, disease/health, and individual animal condition. Research may focus on species’ natural history traits such as breeding systems, foraging patterns and diet, diving patterns, movements and home range, or time budgets and seasonality of various behavioral activities. At the population level, it may focus on such things as distribution, stock structure and genetic exchange, abundance, trends, status, social structure, migration, demographics including vital rates (growth, birth, and death rates), life history traits, evolution, or taxonomy. At the ecosystem level it may focus on such things as prey abundance, distribution, and availability; competition; predator avoidance, and habitat selection or use. For conservation purposes, it often focuses on marine mammal/human conflicts such as fishery interactions, ship strikes, disturbance, entanglement in marine debris, direct taking, and habitat degradation. Finally, research can involve the development, testing, and deployment of a wide range of scientific methods and technologies, such as line-transect, mark-recapture,

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<sup>10</sup> Scanned versions of those reports are available on the Commission web site ([www.mmc.gov](http://www.mmc.gov)).

<sup>11</sup> The report on the fiscal year 2009 survey also is available on the Commission web site.

<sup>12</sup> Following the fiscal year 2009 survey the Commission revised the survey to capture more information, and in 2012 the Commission requested data from fiscal years 2010 and 2011. Following that survey the loss of the survey program manager and severe financial constraints associated with sequestration significantly delayed the processing and analysis of the data. At the same time, in response to strong feedback received from agencies on the FY2010-11 and FY2009 surveys, the Commission decided to redesign the survey and develop a new online survey app. The changes in the survey design mean that the FY2010-11 data could not be compared with data collected with the new survey. Because of this limitation and because the FY2010-11 data were by then out of date, the Commission decided not to report on those data, but instead to focus on the new application and collection of higher quality data from this point forward.

<sup>13</sup> In this report, the term “agency” refers generically to federal departments, administrations, bureaus, services, offices, programs, institutions, commissions, etc.

and photo-identification methods, the development and refinement of various types of tags, tracking devices, acoustic devices, tissue-sampling devices, analytical software, assessment models, and simulation software, and social science and economic studies of human interactions with marine mammals and their importance to society.

Conservation activities are primarily aimed at risks to marine mammals arising from human-related activities. They may involve the development of conservation regulations, policies, permits to mitigate activities that may take<sup>14</sup> marine mammals incidentally, development of mitigation and monitoring measures, enforcement, education and outreach, status reviews and listing decisions, recovery planning, section-7 consultations under the Endangered Species Act (ESA), co-management of subsistence hunting, stranding and entanglement response, rehabilitation, the application of new technologies/equipment (e.g., fishing gear), and evaluation of management. Supporting activities such as administration, infrastructure development and maintenance, capital investment, information/database development and maintenance, and communications (e.g. workshops, conferences) also are essential for marine mammal conservation.

This report describes the results of a survey of such activities by federal agencies for fiscal year 2014. It does not include related marine mammal studies funded by state agencies or funds dispersed from the Deepwater Horizon settlement funds. The results include funding levels and associated information reported by agencies and basic analyses of that information, such as funding by agency, region, project objective, taxonomic family, and conservation status of the focal species. A companion document, “Survey of Federally Funded Marine Mammal Research and Conservation – Fiscal Year 2014 – Project Details,”<sup>15</sup> contains detailed information<sup>16</sup> on each of the 504 projects submitted to the survey.

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<sup>14</sup> “Take” means to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal (MMPA Sec. 3 (13)).

<sup>15</sup> The companion document is available on request from the Marine Mammal Commission (SurveyFFR@mmc.gov).

<sup>16</sup> Sponsoring Department, Agency and Office; Project Title; Performing Organization; Type of Organization, Direct Expenditures, Data Disposition, Project Objectives; Focal Species; and Project Locations (LMEs)

## Methods

In the spring of 2015, the Commission made an online data-entry application available to federal agencies to survey fiscal year 2014 data on their marine mammal activities. Federal agencies known to have funded, or that might have funded, research or conservation efforts for marine mammals in fiscal year 2014 were asked to participate.

The Commission identified all of the administrative ‘units’ within federal departments that were known to, or thought to, conduct or fund marine mammal activities. These ‘units’ were part of agencies –

- with lead responsibility for marine mammal research and management (NOAA Fisheries, US Fish and Wildlife Service, and US Geological Survey);
- conducting or managing activities that affect marine mammals (e.g., the Department of Navy, and the Bureau of Ocean Energy Management);
- with missions explicitly related to marine mammal conservation (e.g., NOAA Fisheries, NOAA’s National Ocean Service, and the US Fish and Wildlife Service); or
- that conduct/fund research involving marine mammals (e.g., National Institutes of Health, and the National Science Foundation).

Table 1. Project fields in the fiscal year 2014 online survey.

Project fields
<ul style="list-style-type: none"> <li>• Title and description</li> <li>• Fiscal year</li> <li>• Principal investigator(s) name(s)</li> <li>• Sponsoring agency</li> <li>• Performing organization name/type</li> <li>• Direct expenditures</li> <li>• Objective(s) and allocation</li> <li>• Species/stock(s) and allocation</li> <li>• Location(s) (LMEs)<sup>17</sup> and allocation</li> <li>• Data disposition and products</li> </ul>

The Commission recognized three sources of expenditures toward marine mammals: 1) discrete projects, 2) miscellaneous activities, and 3) support. Information on projects with the associated direct expenditures were collected and linked to the ‘unit’ within which the project operated, or received support or funding. For each ‘unit’ that conducted or funded projects or miscellaneous activities, the survey asked for an estimate of the total marine mammal funding for that unit, which included the direct expenditures for projects and miscellaneous activities and the associated support costs.

<sup>17</sup> Large marine ecosystems

For each project, the survey requested data that would indicate the effort and resources (i.e., number of projects and amount of funding) dedicated to marine mammal research and conservation relative to factors of interest (e.g., agency, objectives, region, species, and species conservation status; data fields are listed in Table 1). The survey asked respondents to specify 1) the objectives of each project (Table 2), 2) the species that were the focus of each project (for the full list of species that were reported on in the survey see Appendix B), and 3) locations in which the projects operated or where the work would be relevant. Locations were specified quite broadly as large marine ecosystems or open ocean areas (Appendix C). In addition, the survey asked that the respondent specify if the data/information generated by the project would be archived in a public database, and, if so, which types of data would be archived and which database(s) would be the recipient(s).

The Commission processed the survey data entered, and worked with respondents to resolve any discrepancies revealed during a quality assurance/control process. The Commission then completed a report that summarized the survey data, submitted the report in draft form to the agencies for their review, modified the draft as appropriate based on agency feedback, and finalized the report.

Table 2. The project objectives field in the fiscal year 2014 online survey.

Project Objectives		
<p>1) Biology</p> <ul style="list-style-type: none"> <li>a) Anatomy / Morphology</li> <li>b) Behavior – social / reproductive</li> <li>c) Behavior – diving / foraging / feeding</li> <li>d) Behavior – kinematics / activity/energy budgets</li> <li>e) Bioacoustics – sound production</li> <li>f) Bioacoustics – sound reception</li> <li>g) Genetics/taxonomy</li> <li>h) Paleontological studies</li> <li>i) Physiology /endocrinology / neurology / biochemistry</li> <li>j) Reproduction / growth / aging</li> </ul> <p>2) Ecology</p> <ul style="list-style-type: none"> <li>a) Habitat characterization</li> <li>b) Habitat use</li> <li>c) Trophic interactions / diet / foraging ecology</li> <li>d) Behavioral ecology</li> <li>e) Population ecology</li> <li>f) Ecosystem / environmental studies</li> <li>g) Traditional ecological knowledge</li> </ul> <p>3) Population Dynamics</p> <ul style="list-style-type: none"> <li>a) Vital rates</li> <li>b) Age structure / sex ratio</li> <li>c) Size / abundance</li> <li>d) Distribution / movements</li> <li>e) Population dynamics</li> <li>f) Population genetics / stock delineation</li> <li>g) Stock assessment</li> </ul> <p>4) Animal Health</p> <ul style="list-style-type: none"> <li>a) Stranding response</li> <li>b) Care / rehabilitation</li> <li>c) Necropsy</li> <li>d) Sample collection</li> <li>e) Diagnostics</li> <li>f) Monitoring / assessment</li> <li>g) Contaminants</li> <li>h) Biotoxins</li> <li>i) Disease</li> <li>j) Body condition</li> </ul>	<p>5) Fishery Interactions</p> <ul style="list-style-type: none"> <li>a) Bycatch – gill net / pot gear entanglement</li> <li>b) Bycatch – other gear</li> <li>c) Bycatch – mitigation</li> <li>d) Entanglement response</li> <li>e) Depredation</li> <li>f) Indirect / Competitive interactions</li> </ul> <p>6) Anthropogenic Sound Impacts</p> <ul style="list-style-type: none"> <li>a) Characterization / analysis of sound budges / soundscapes</li> <li>b) Military activities – sonar</li> <li>c) Military activities - explosions</li> <li>d) Energy development – seismic surveys</li> <li>e) Energy development – high-res geophysical surveys</li> <li>f) Energy development – drilling</li> <li>g) Energy development – platform removal</li> <li>d) Industrial activities - shipping</li> <li>e) Industrial activities - pile driving</li> </ul> <p>7) Pollution Impacts</p> <ul style="list-style-type: none"> <li>a) Hydrocarbon spills / leaks</li> <li>b) Persistent toxins</li> <li>c) Nutrient runoff / HABs</li> <li>d) Marine debris - plastics</li> <li>e) Marine debris – derelict fishing gear</li> </ul> <p>8) Other Anthropogenic Impacts</p> <ul style="list-style-type: none"> <li>a) Vessel strikes</li> <li>b) Tourism - observing</li> <li>c) Tourism – swim-with / feeding</li> <li>d) Disturbance</li> <li>e) Coastal development / dredging</li> </ul> <p>9) Human Dimensions</p> <ul style="list-style-type: none"> <li>a) Whaling / subsistence harvesting</li> <li>b) Marine mammals and coastal communities</li> <li>c) Social science</li> <li>d) Economics</li> </ul>	<p>10) Conservation, Management and Policy</p> <ul style="list-style-type: none"> <li>a) Conservation</li> <li>b) Population protection / recovery</li> <li>c) Monitoring</li> <li>d) Surveillance / enforcement</li> <li>e) Regulatory compliance</li> </ul> <p>11) Communication, Outreach, and Meetings</p> <ul style="list-style-type: none"> <li>a) Publications</li> <li>b) Outreach</li> <li>c) Education</li> <li>d) Meetings / workshops, symposia / conferences</li> </ul> <p>12) Technology development</p> <ul style="list-style-type: none"> <li>a) Photo ID</li> <li>b) Tag / telemetry devices</li> <li>c) Acoustic devices</li> <li>d) Biological sampling devices</li> <li>e) Oceanographic sampling devices</li> <li>f) Sampling platforms</li> <li>g) Cameras</li> <li>h) Imaging / image analysis</li> <li>i) GIS</li> <li>j) Acoustic detection, classification and localization algorithms / models / software</li> <li>k) Acoustic density estimation models / software</li> <li>l) Line transect methodology</li> <li>m) Habitat mapping / modeling</li> <li>n) Mathematical / statistical / simulation models</li> <li>o) Database design / development / maintenance / archiving</li> </ul>



## Results

### Funding by Federal Departments, Agencies and Offices

This section describes patterns in total funding by departments, agencies and offices, where total funding includes 1) direct project expenditures, 2) direct expenditures for miscellaneous marine mammal activities, and 3) the indirect or support costs associated with the two categories of direct expenditures.

#### Departments

Respondents from five federal departments (Commerce, Defense, Interior, Energy, Homeland Security, and Health and Human Services), and two independent agencies (National Science Foundation, and Marine Mammal Commission) provided data through the survey. Just over \$134M in total funding for marine mammal activities in fiscal year 2014 was reported across the federal government (Table 3). The bulk of that funding (94 percent) was accounted for by the Departments of Commerce, Defense and Interior.

Within each department, one or more agencies or offices responded to the survey; the number of projects and total funding they reported is provided in Appendix A. The National Ocean Service's Offices of Coastal Management and Response & Restoration, and the Department of Defense's Defense Advanced Research Projects Agency all indicated that they did not conduct or fund any marine mammal activities in fiscal year 2014. The Air Force, National Aeronautics and Space Administration, and the Smithsonian Institution did not provide data to the survey. The Department of State did not respond to the Commission's request for data.

Table 3. Fiscal year 2014 total funding reported by federal departments.

Department	Funding (millions)	Percent of total
Commerce	71.3	53
Defense	33.6	25
Interior	20.8	16
Independent agencies	4.4	3
Energy	2.6	2
Homeland Security	1.2	1
Health and Human Services	0.59	<1
<b>Total</b>	<b>134.3</b>	<b>100</b>

## Agencies

Responding agencies reported 504 marine mammal projects, miscellaneous activities and support costs totaling \$134.3M (Figure 1, Table 4).<sup>18</sup> The following is a summary of funding by agency, in order of each agency's total funding for marine mammal research and conservation in fiscal year 2014.

Table 4. Fiscal year 2014 total funding reported by federal agencies.		
Agency	Funding (millions)	Percent of total
NOAA Fisheries (Commerce)	66.2	49
Department of the Navy (Defense)	29.6	22
Bureau of Ocean Energy Management (Interior)	7.1	5
U.S. Geological Survey (Interior)	6.7	5
U.S. Fish & Wildlife Service (Interior)	6.5	5
National Ocean Service (Commerce)	4.3	3
Marine Mammal Commission (Independent)	3.3	2
Office of Energy Efficiency & Renewable Energy (Energy)	2.6	2
Environmental Research Programs (Defense)	2.1	2
U.S. Army Corps of Engineers (Defense)	1.8	1
U.S. Coast Guard (Homeland Security)	1.2	1
National Science Foundation (Independent)	1.1	1
NOAA Research (Commerce)	0.78	1
National Institutes of Health (Health & Human Services)	0.59	<1
Bureau of Safety and Environmental Enforcement (Interior)	0.32	<1
National Park Service (Interior)	0.09	<1
<b>Total</b>	<b>134.3</b>	<b>100</b>

## Department of Commerce

The National Oceanic and Atmospheric Administration (NOAA), with its mission of “Science, Service, and Stewardship,” is responsible for researching, monitoring and managing our ocean. Marine mammal activities take place within three of its ‘line offices’ – NOAA Fisheries,<sup>19</sup> the National Ocean Service and NOAA Research.<sup>20</sup>

<sup>18</sup> The project details are provided in a “Project Details” companion document.

<sup>19</sup> Also known as the National Marine Fisheries Service

<sup>20</sup> Also known as the Office of Ocean and Atmospheric Research

## ***NOAA Fisheries***

In U.S. waters, NOAA Fisheries, also known as the National Marine Fisheries Service, is the primary agency responsible for research and conservation of most marine living resources, including the majority of marine mammal species. NOAA Fisheries' research and conservation efforts focus generally on stock identification and assessment, management of human interactions with marine mammals (e.g., fisheries), health and stranding, and planning and implementation of recovery measures for species listed as endangered or threatened under the ESA or designated as depleted or categorized as strategic under the MMPA. The research activities of each regional science center focus on the marine mammals in that region and are intended to support the management needs of the corresponding regional office. Within each regional office, the Protected Resources Division assumes primary responsibility for marine mammal management, protection, and conservation activities.

At NOAA Fisheries headquarters, the Office of Science and Technology and the Office of Protected Resources play important roles in marine mammal research and conservation. The Office of Science and Technology provides broad oversight of scientific activities, including many of those aimed at marine mammals and the ecosystems of which they are a part. The Office of Protected Resources develops policies and regulations to implement provisions of the MMPA and ESA. It issues permits and authorizations for activities that take marine mammals, and it manages the Marine Mammal Health and Stranding Response Program and the John H. Prescott Marine Mammal Rescue Assistance Grant Program. The Office also is responsible for, or oversees, listing decisions and recovery activities such as developing recovery plans, designating critical habitat, managing a grants program under section 6 of the ESA, and conducting consultations under section 7 of the ESA.

In fiscal year 2014, NOAA Fisheries allocated \$66.2M (49 percent of the total federal funding reported; Table 5, Figure 2) to 129 marine mammal research and conservation projects, and other marine mammal activities. Within NOAA Fisheries funding was split between regional offices (\$23.2M, 35 percent of the \$68.8M), regional science centers (\$33.1M, 50 percent), and national programs (\$9.9M, 15 percent) (Figure 2, Table 5). On a regional basis, there were in effect three tiers of funding by NOAA Fisheries for marine mammal research and conservation (Table 5). The Alaska region reported 43 percent (\$24.3M) of the combined funding reported by all regional offices and science centers (\$56.3M). In the next tier, the West Coast and Greater Atlantic Regions reported significantly less funding: 18 percent (\$10.1M) and 16 percent (\$9.2M), respectively. And, in the third tier, the Pacific Islands and Southeast Regions reported even less: 11 percent each (\$6.5M and \$6.2M, respectively). Most of the funding expended by national programs (92 percent; \$9.1M) was reported by the Office of Protected Resources at NOAA Fisheries' headquarters in Silver Spring, Maryland.

Table 5. Fiscal year 2014 total funding reported by various headquarters programs, regional offices, and science centers, and by region, within NOAA Fisheries. <sup>21</sup>			
NOAA Fisheries	Funding (millions)	Percent of sub-total	Percent of agency total
<b>Regional offices</b>			
Alaska	11.1	48	17
Greater Atlantic	3.6	16	5
West Coast	3.3	14	5
Southeast	3.1	13	5
Pacific Islands	2.2	9	3
<b>Sub-total</b>	<b>23.2</b>	<b>100</b>	<b>35</b>
<b>Fisheries science centers</b>			
Alaska	13.2	40	20
Southwest	5.6	17	8
Northeast	5.3	16	8
Pacific Islands	4.3	13	7
Southeast	3.1	9	5
Northwest	1.6	5	2
<b>Sub-total</b>	<b>33.1</b>	<b>100</b>	<b>50</b>
<b>Programs</b>			
Office of Protected Resources	9.1	92	14
Office of International Affairs	0.51	5	<1
Office of Science and Technology	0.35	3	<1
<b>Sub-total</b>	<b>9.9</b>	<b>100</b>	<b>15</b>
<b>Total</b>	<b>66.2</b>		<b>100</b>
<b>By regions (regional offices and science centers combined)</b>			
Alaska	24.3		43
Greater Atlantic <sup>22</sup>	10.1		18
West Coast <sup>23</sup>	9.2		16
Pacific Islands	6.5		12
Southeast	6.2		11
<b>Total</b>	<b>56.3</b>		<b>100</b>

<sup>21</sup> For regional totals (offices and science centers combined), the far right column lists the percent of the combined funding directed toward the regions (\$58.8M).

<sup>22</sup> Includes the Northeast Regional Office and Northeast Fisheries Science Center

<sup>23</sup> Includes the West Coast Regional Office, and the Northwest and Southwest Fisheries Science Centers

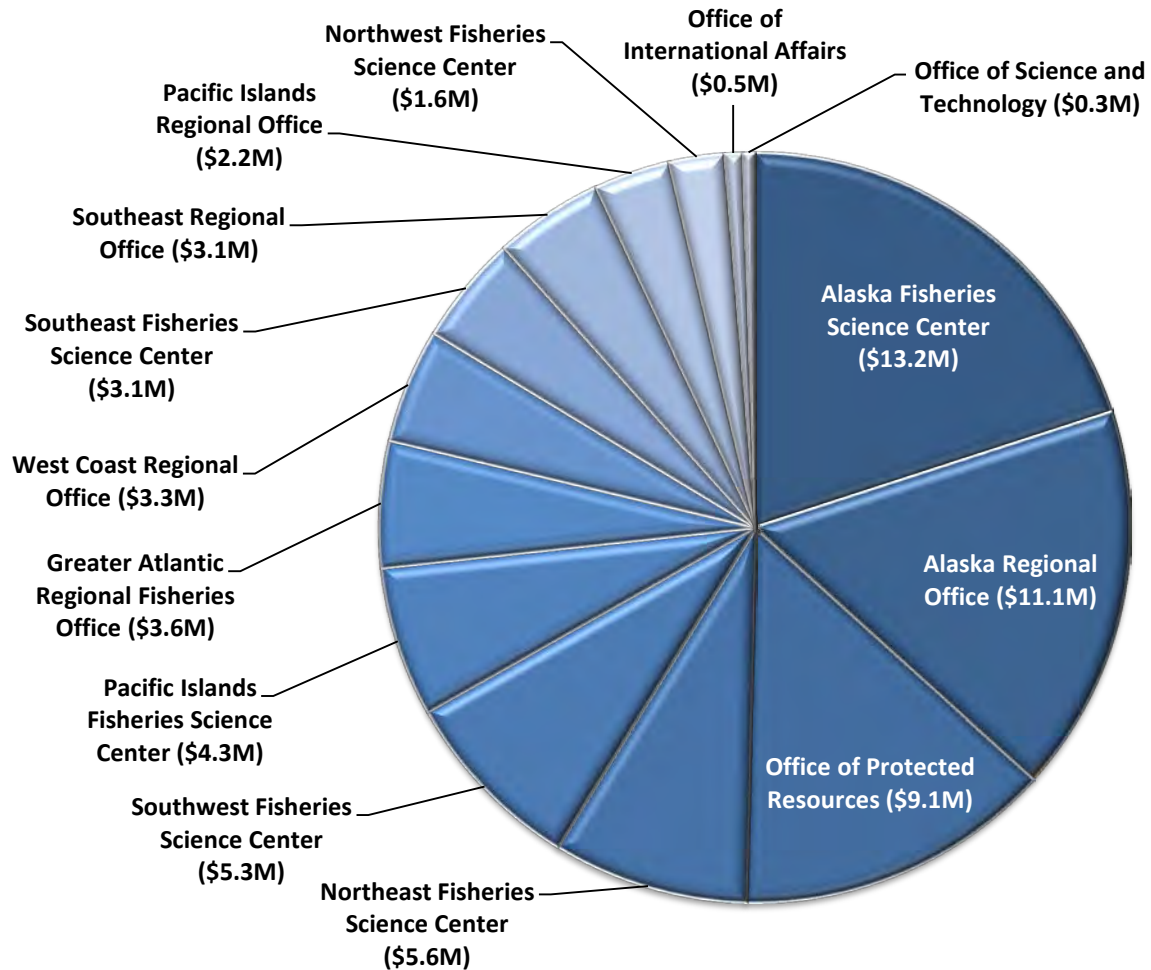


Figure 2. Fiscal year 2014 total funding reported by NOAA Fisheries offices, regional offices, and science centers.

### *National Ocean Service*

The National Ocean Service is comprised of nine centers, programs, and offices, five of which have conducted or supported activities relevant to marine mammal research or conservation in the past:

- The National Centers for Coastal Ocean Science (NCCOS) provide local and national coastal managers with the science, information and tools they need to support research, monitoring and assessment and to address coastal issues, especially harmful algal blooms, pollution, climate change, and ecosystem management;

- The Office of National Marine Sanctuaries supports marine mammal research and conservation activities at most of its 13 marine sanctuaries and one marine national monument; the sanctuaries and monument exist to protect, conserve, and enhance the ecological integrity of special marine ecosystems and the organisms that live within them, including marine mammals;
- The Office for Coastal Management (OCM) unifies private sector, nonprofit, scientific and governmental efforts to make coastal communities more resilient; OCM delivers a wide variety of coastal data, tools and training to coastal communities to address environmental challenges such as protecting endangered species, and protecting coastal communities from hurricanes and sea-level rise;
- The Office of Response and Restoration (OR&R) provides scientific information for responding to coastal hazards, such as oil and chemical spills, and restoring affected ecosystems; OR&R provides the science and information needed to support the U.S. Coast Guard during spills and in coordinating with federal, state, and tribal natural resource trustees to restore coastal resources damaged by those spills; and
- The Integrated Ocean Observing System Program (IOOSP); part of the larger interagency Integrated Ocean Observing System, it provides ocean-related information, investigative tools, and forecasts to ocean users, managers, and emergency responders.

For fiscal year 2014, the National Ocean Service reported a total of 22 projects and \$4.3M in funding for those projects and other marine mammal activities. Eight National Marine Sanctuaries<sup>24</sup> reported \$3.5M in funding, and NCCOS reported the remaining \$0.8M. The other offices (OCM and OR&R) and the IOOSP did not have any marine mammal activities to report for fiscal year 2014.

### **NOAA Research**

NOAA Research, also known as the Office of Oceanic and Atmospheric Research, conducts or supports research on environmental phenomena such as ocean currents, El Niño and La Niña events, fisheries productivity, deep sea thermal vents, climate variability, and coastal ecosystem health – all topics indirectly related, but highly relevant, to marine mammals. The Office’s research network includes the following:

- NOAA Research Laboratories collaborate with universities and non-profit organizations to conduct a broad range of ocean research. The Pacific Marine Environmental Laboratory (PMEL) has been involved in research on acoustics, the Arctic, and Arctic climate disruption, much of which is highly relevant to the conservation and management of Arctic marine mammals;
- The Office of Ocean Exploration and Research is dedicated to increasing ocean knowledge through the exploration, research, and the use of undersea technologies. Research activities conducted by, or with the support of, this office promote understanding of the marine environment and often provide insights into the natural history of marine mammals and their use of specific marine environments;

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<sup>24</sup> Channel Islands, Cordell Bank, Gray’s Reef, Greater Farallones, Hawaiian Islands Humpback Whale, Monterey Bay, Papahānaumokuākea, and Stellwagen Bank National Marine Sanctuaries



- The Climate Program Office provides strategic guidance and oversight for NOAA's climate science and services programs. This office funds programs that focus on understanding the climate system, predicting climate variability and change, and improving society's ability to adapt to such change. Studies conducted or supported by this Office also provide insights into the potential effects of climate disruption on marine mammals; and
- The National Sea Grant College Program works with universities and research institutions to support scientific studies of ocean resources. State Sea Grant organizations occasionally fund marine mammal studies. In fiscal year 2014, NOAA Research's National Sea Grant Program reported 11 projects related to marine mammals totaling \$0.78M.

None of the other units reported funding or supporting marine mammal activities, although the PMEL did conduct four marine mammal projects that were funded by and reported to the survey by other federal agencies or offices.

### **Department of Defense**

The Mission of the Department of Defense is "to provide the military forces needed to deter war and to protect the security of our country." Preparations and training to fulfill this mission can have impacts on the environment and marine mammals. Several components of the Department of Defense are focused on understanding, monitoring and mitigating those impacts.

### ***Department of the Navy***

The Navy funds marine mammal research and conservation activities to meet its environmental compliance obligations under the MMPA, ESA, and National Environmental Policy Act (NEPA), and to fulfill its responsibilities as a steward of the marine environment. A review of the research and conservation activities undertaken by the Navy indicates that these activities are aimed largely at three particular needs. The first is to conduct studies related to the abundance, distribution, foraging, reproduction, physiology, hearing and sound production, behavior, and ecology of marine mammals. The second is to understand the potential effects on marine mammals from Navy training and testing activities, particularly from the use of mid-frequency active sonar and underwater detonations, in order to improve impact analysis. The third is to monitor and report on Navy training and testing activities involving the use of active sonar and underwater detonations. Overall, the Navy reported allocating \$29.6M (22 percent of all federal funding reported) for 180 marine mammal research and conservation projects, and other activities, in fiscal year 2014 (Figure 2, Table 4). Within the Navy, research and conservation of marine mammals is funded primarily by the Office of Naval Research (ONR), the Living Marine Resources (LMR) program, the Navy's Atlantic and Pacific Fleets, and its Systems Commands<sup>25</sup> (Figure 3, Table 6).

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<sup>25</sup> Naval Air Systems Command and Naval Sea Systems Command

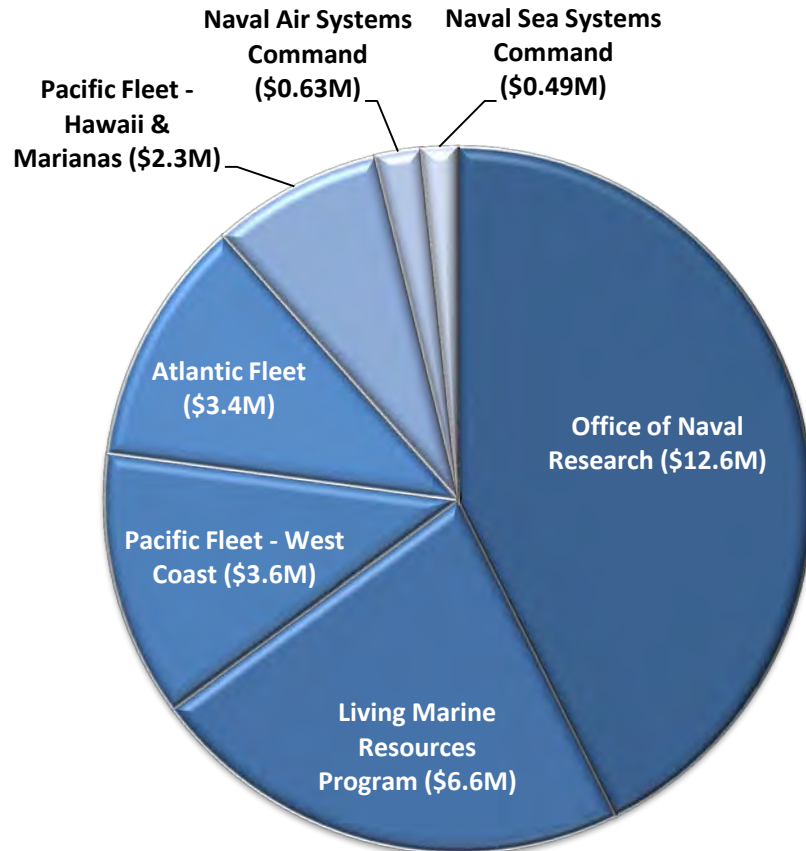


Figure 3. Fiscal year 2014 total funding reported by the Navy.

ONR supports a wide range of basic and early-stage applied research and technology development related to understanding the physiological, behavioral, ecological, and demographic effects of sound on marine mammals. In fiscal year 2014, ONR reported directing \$12.6M to 140 marine mammal research and conservation projects (Figure 3, Table 6). Under the Chief of Naval Operations, the Fleets and System Commands reported allocating \$10.4M for 26 projects aimed at mitigating and monitoring their activities to avoid, minimize, and/or document the potential effects on marine mammals during training and testing activities. Also under the Chief of Naval Operations, the Living Marine Resources (LMR) Program, which supports applied research and technology development to improve understanding of the consequences for marine species occurring near Navy at-sea training and testing activities, reported allocations of \$6.6M for 14 projects, many of which focused on new passive acoustic monitoring technologies and methods, hearing studies, and the SOCAL behavioral response study.

Table 6. Fiscal year 2014 total funding reported by the Navy.		
Office	Funding (millions)	Percent of total
Office of Naval Research (ONR)	12.6	43
Living Marine Resources (LMR)	6.6	23
Pacific Fleet – West Coast	3.6	12
Atlantic Fleet	3.4	11
Pacific Fleet – Hawaii and Marianas	2.3	8
Naval Air Systems Command	0.6	2
Naval Sea Systems Command	0.5	2
<b>Total</b>	<b>29.0</b>	<b>100</b>

### *U.S. Army Corps of Engineers*

The U.S. Army Corps of Engineers serves as the nation's engineers, working with other federal agencies, state agencies, non-governmental organizations, and academic institutions. It builds, supports, and manages dams, levees, and waterways; supports military activities with construction and infrastructure needs; assists in various ways with natural resource management and restoration; assists with disaster response; and undertakes various development projects to support the national economy. In fiscal year 2014 the Corps reported \$1.8M in funding for two projects and numerous other activities related to marine mammal research and conservation in 15 of their districts.<sup>26</sup> Almost all of those funds were to protect specific marine mammal species during Corps navigation projects.

### *Environmental Research Programs*

The Strategic Environmental Research and Development Program (SERDP) is the Department of Defense's science and technology program for assessing the impact of military activities on the environment, including marine mammals. In addition, SERDP manages and protects the natural resources, including threatened and endangered species, on Department of Defense lands and ocean training ranges. SERDP achieves its goals by working with the Department of Energy, the Environmental Protection Agency and other relevant federal agencies. The Environmental Security Technology Certification Program (ESTCP) identifies cost-effective technologies that address the Department of Defense's highest environmental priorities. The program promotes the transfer of innovative technologies that have successfully established proof of concept to field or production use. The combined funding by the Department of Defense for two ESTCP projects, four SERDP projects and other activities during fiscal year 2014 was \$2.1M.

<sup>26</sup> Alaska, Charleston, Galveston, Honolulu, Jacksonville, Los Angeles, Mobile, New England, New Orleans, New York, Norfolk, Philadelphia, Savannah, Seattle, and Wilmington

## **Department of the Interior**

The Department of the Interior protects and manages the nation's natural resources and cultural heritage, provides scientific and other information about those resources, and honors the nation's trust responsibilities or special commitments to American Indians, Alaska Natives, and affiliated island communities. The Department has a diverse set of agencies that conduct or fund marine mammal projects and activities. The U.S. Fish and Wildlife Service (FWS) is responsible for managing polar bears, walrus, sea otters and West Indian manatees, and the U.S. Geological Survey (USGS) provides much of the scientific research necessary to support that management. The Bureau of Ocean Energy Management (BOEM) and the Bureau of Safety and Environmental Enforcement (BSEE) working cooperatively manage the impact of the energy sector on the ocean, including that on marine mammals, in U.S. federal waters. The National Park Service manages a large number of National Seashores and coastal National Parks, and similarly the FWS manages numerous coastal National Wildlife Refuges. In fiscal year 2014, the Department of the Interior, through these agencies, reported allocations of \$20.8M for 120 marine mammal projects and other activities (Table 7).

### ***Bureau of Ocean Energy Management and the Bureau of Safety & Environmental Enforcement***

The safe development of the nation's offshore energy and mineral resources is under the purview of BOEM. BOEM's Office of Environmental Programs, three regional offices (Alaska, Pacific, and Gulf of Mexico), and its Office of Renewable Energy Programs (currently focused on the Atlantic outer continental shelf, OCS, region) plan and initiate research needed to comply with the Outer Continental Shelf Lands Act, MMPA, ESA, NEPA, and other legislation. The research is organizationally divided into regions of the U. S. outer continental shelf: the Alaska, Pacific, Gulf of Mexico, and Atlantic OSC regions. During fiscal year 2014 BOEM allocated \$7.1M (Table 7) for 22 projects and other activities, most of which were designed to assess the distribution, movements, relative abundance, and ecology of marine mammals in areas where oil and gas activities were scheduled to occur, were in development, or already underway. The regional distribution of funds within BOEM was extremely uneven in fiscal year 2014. The Gulf of Mexico reported just 0.1 percent (\$15K) of the funds that the agency directed toward marine mammals. In contrast, the Alaskan region reported 94 percent (\$6.7M) of the agency's marine mammal budget. Those funds were focused on Arctic marine mammals (e.g., bowhead and gray whales, the "ice" seals, and walrus). BSEE reported \$322K in funding for research associated with environmental enforcement activities.

### ***U.S. Geological Survey***

The USGS works with the FWS, other federal and state agencies, and conservation and academic organizations to study the biology, population dynamics, and ecology of polar bears, walrus, sea otters, and West Indian manatees. The Survey is strictly a research organization and has no management or regulatory authority over these species. The agency conducts marine mammal research under the Wildlife Program within its Ecosystems Mission Area. The USGS makes the results of its research available to management agencies, such as the FWS, to inform management decisions. In fiscal year 2014 the USGS reported allocations of \$6.7M (Table 7) for 26 projects and other activities to assess the status and health of the polar bear, walrus, sea otter, and West Indian manatee, to ascertain their vulnerability to natural and human-related risk factors, and to advise on management measures needed to protect and conserve them.

Table 7. Fiscal year 2014 total funding reported by agencies, centers, and offices, and by region, within the Department of the Interior.

Department of the Interior	Funding (millions)	Percent of sub-total	Percent of total
<b>Bureau of Ocean Energy Management</b>			
Alaska Outer Continental Shelf Office	6.7	94	32
Atlantic Outer Continental Shelf Office	0.42	6	2
Other Offices <sup>27</sup>	<0.10	<1	<1
<b>Sub-total</b>	<b>7.1</b>	<b>100</b>	<b>34</b>
<b>U.S. Geological Survey</b>			
Alaska Science Center	3.6	53	17
Southeast Ecological Science Center	1.1	17	5
Headquarters	1.0	15	5
Ecological Research Centers <sup>28</sup>	0.83	12	4
Other Science Centers <sup>29</sup>	0.20	3	1
National Wildlife Health Center	<0.10	<1	<1
<b>Sub-total</b>	<b>6.7</b>	<b>100</b>	<b>32</b>
<b>Fish and Wildlife Service</b>			
Marine Mammals Management Office, Alaska	3.9	60	19
Ecological Services Program <sup>30</sup>	1.6	25	8
Crystal River National Wildlife Refuge, Florida	0.88	14	4
International Affairs Office – Permits	<0.10	1	<1
Other National Wildlife Refuges <sup>31</sup>	<0.10	<1	<1
<b>Sub-total</b>	<b>6.5</b>	<b>100</b>	<b>31</b>
<b>Bureau of Safety and Environmental Enforcement</b>			
Environmental Enforcement Division	0.32		2
<b>National Park Service</b>			
National Seashores <sup>32</sup>	<0.10		<1
<b>Total</b>	<b>20.8</b>		<b>100</b>
<b>By region (agencies, centers, and offices combined)</b>			
Alaska	14.1		73
Atlantic and Gulf of Mexico	4.0		21
Pacific	1.3		6
<b>Total</b>	<b>19.4</b>		<b>100</b>

<sup>27</sup> 'Headquarters,' and the Gulf of Mexico and Pacific OCS Offices; 'Headquarters' refers to projects covering more than one OCS region.

<sup>28</sup> Western and Patuxent Ecological Research Centers

<sup>29</sup> Leetown and Fort Collins Science Centers

<sup>30</sup> Headquarters, six regional and field offices (Regions 4 and 8, North Florida, Ventura, Caribbean, Washington, and Texas Coast)

<sup>31</sup> Farallon, Oregon Coast, and Alaska Maritime National Wildlife Refuges

<sup>32</sup> Point Reyes, Cape Hatteras, Cape Cod National Seashores

### *U.S. Fish and Wildlife Service*

The FWS has primary responsibility for the conservation and management of the polar bear, West Indian manatee, Pacific walrus, and sea otter populations that occur within the U.S. Exclusive Economic Zone. The Service also supports the protection and conservation of these species and others<sup>33</sup> in foreign and international waters. The FWS includes a number of offices or programs that have a role in marine mammal research or management:

- The National Marine Mammal Coordinator at FWS headquarters provides national consistency for marine mammal-related activities;
- The Division of Management Authority reviews applications and issues permits for scientific research, enhancement, public display, and import/export of marine mammal parts and products;
- The Division of International Conservation coordinates international activities for the marine mammal species the FWS is responsible for and that occur in foreign or international waters;
- The Endangered Species staff at FWS headquarters coordinate activities for species under the ESA, including listing, down-listing or delisting, critical habitat determination, and recovery planning;
- The National Wildlife Refuge System has 180 coastal and marine refuges, most having at least some marine mammal presence. Refuge personnel are responsible for managing marine mammal populations and habitat. Refuge staff assists during stranding and entanglement events, marine mammal surveys and assessments, and other aspects of marine mammal conservation.
- The Marine Mammal Management office in Anchorage, Alaska, has the responsibility to manage and conserve polar bears, Pacific walruses, and northern sea otters in Alaska;
- The Washington Fish and Wildlife Office manages northern sea otters in Washington state;
- The Ventura Fish and Wildlife Office manages southern sea otters in California;
- The North Florida Ecological Services Field Office manages the Florida subspecies of the West Indian manatee;
- The Caribbean Field Office manages the Antillean subspecies of the West Indian manatee in Puerto Rico; and
- The FWS regional offices provide support to these field offices for their work with partners to census populations, assess population health, develop and implement conservation plans, promulgate regulations, and create cooperative relationships.

In fiscal year 2014 FWS reported allocating \$6.5M (Table 7) to 40 projects and other activities related to the marine mammals under its purview. Most of those funds (\$3.9M) were reported by the Marine Mammals Management office for the management of polar bears, walruses and sea otters in Alaska (Table 7). By contrast to FWS's Alaska region with three species to manage, FWS allocated \$1.8M in the Atlantic, Gulf of Mexico and Caribbean on manatees, and \$259K on sea otters along the Pacific Coast.<sup>34</sup>

<sup>33</sup> West African manatee, Amazonian manatee, dugong, Atlantic walrus, Western sea otter, and marine otter

<sup>34</sup> Washington and California



### ***National Park Service***

The National Park Service contributes to research and management of marine mammals in waters and on lands under its authority. Its activities include conducting section 7 consultations under the ESA, ensuring compliance with NEPA, and undertaking marine mammal conservation efforts. The Park Service is a leader in marine mammal conservation and education at sites such as the Channel Islands and Kenai Fjords National Parks, Point Reyes and Cape Cod National Seashores, and Golden Gate and Gateway National Recreational Areas. Park Service Research and Learning Centers, like the Ocean Alaska Science and Learning Center, conduct marine mammal research in collaboration with other federal agencies, state partners, and universities. The Park Service also supports capacity building and training of its resource managers, who participate in marine mammal stranding networks, participate in marine mammal health and disease monitoring, and conduct marine mammal necropsies. Additionally, the Park Service functions in a critical junction between marine mammal science and public education. Educational displays, such as the skeletal articulation project of the humpback whale known as "Snow" at Glacier Bay National Park and Preserve, connect students and volunteers to marine mammal conservation through hands-on science. The Park Service considers marine mammals to be a focal point of its Migratory Species Program, which was established in 2009. In fiscal year 2014 the National Park Service allocated \$89K for 15 studies of marine mammal ecology and status, and other activities, in three of its National Seashores (Table 7).

### **Independent Agencies**

#### ***National Science Foundation***

The National Science Foundation (NSF) supports research projects that examine aspects of marine mammal habitats such as large marine ecosystems, including in the Antarctic and Arctic ecosystems, and provides support for a number of basic studies on marine mammal physiology, behavior, and ecology. In addition, NSF supports ocean research in disciplines considered important to marine mammals as well as research on methods to mitigate, monitor, and assess the potential effects of certain human activities and natural environmental factors on marine mammals and their habitats.

In fiscal year 2014, NSF reported \$1.1M (Figure 1, Table 4) in funding for nine projects focused largely on basic biology and ecology, population dynamics and anthropogenic sound impacts.

#### ***Marine Mammal Commission***

The Marine Mammal Commission (the Commission) supports research and studies pertaining to the conservation and protection of marine mammals in accordance with the provisions of the MMPA, ESA, and NEPA. The Commission manages its research program to avoid redundancy with studies conducted by other agencies and to fill information gaps. Through its support of research and conservation projects, it seeks to develop pro-active solutions to emerging human/marine mammal issues before they become crises requiring more costly solutions. The Commission fills an important role in the marine mammal community, funding small-scale but important projects, of which some are innovative studies looking for seed money and others support low budget but vital research and conservation activities in developing countries. In fiscal year 2014 the Commission was allocated a total \$3.3M to carry out its duties (Figure 1,

Table 4), including \$248K in expenditures for 15 projects covering a wide range of marine mammal species and related topics.

## **Department of Energy**

### ***Office of Energy Efficiency & Renewable Energy***

The Department of Energy occasionally supports marine mammal research. Studies have focused primarily on sustainable energy development in aquatic ecosystems, and on problems related to monitoring marine mammals. For fiscal year 2014 survey the Office of Energy Efficiency & Renewable Energy's Wind and Water Power Technologies Office reported the allocation of just over \$2.5M for eight research projects and other activities related to marine mammals (Figure 1, Table 4). Research was focused on the development of tools needed to measure and monitor impacts of renewable energy systems on marine mammals, and gather baseline information off the U.S. East Coast and Oregon.

## **Department of Health and Human Services**

### ***National Institutes of Health***

The National Institutes of Health (NIH) in the Department of Health and Human Services is the nation's medical research agency and consists of 27 Institutes and Centers. It supports basic research on a wide range of topics, some of which are relevant to marine mammal health. Similarly, the health of marine mammals is considered a potential factor in disease processes that may affect humans and/or domestic animals. In fiscal year 2014, NIH reported four projects pertinent to marine mammal physiology and toxin exposure totaling approximately \$594K (Figure 1, Table 4).

## **Department of Homeland Security**

### ***U.S. Coast Guard***

The U.S. Coast Guard (USCG) is the only agency within the Department of Homeland Security that expends resources on issues related to marine mammals. The USCG focuses primarily on compliance with and enforcement of the nation's maritime laws and regulations and on emergency response to both natural (e.g., hurricanes) and human-related crises (e.g., distressed vessels). The Coast Guard supports some marine mammal research and conservation activities through its Marine Protected Species Program, which aligns its goals and objectives closely with those of the National Marine Fisheries Service and Fish and Wildlife Service. In fiscal year 2014, the USCG reported two projects pertinent to marine mammal physiology and toxin exposure, totaling approximately \$1.2M (Figure 1, Table 4).

## Project Expenditures

Total funding by departments, agencies and offices was described in the previous sections, where total funding included direct project expenditures, direct expenditures for miscellaneous marine mammal activities and the indirect or support costs associated with these two categories of expenditures. This section summarizes the projects reported to the survey in terms of their objectives, focal species, and geographical coverage, using the number of projects and direct expenditures as measures of importance.

### Project Objectives

The survey asked respondents to specify the objectives for each project and the allocation of the project funding among objectives. Of the 504 projects reported to the survey, 202 listed a single objective, and another 211 listed two to five objectives. Fifty-five projects listed 6-10 objectives, and 36 projects listed more than 10 objectives.

Categories representing activities focused on assessing and understanding the status of marine mammals (Population Dynamics and Stock Assessment; Conservation, Management and Policy; Ecology; Technology Development; Biology; and Animal Health) were associated with the largest expenditures (\$22.9M to \$7.2M per category; Figure 4; Table 8). In contrast, expenditures for projects that focused on the impacts of human activities on marine mammals were much lower. The largest expenditures within this group were for objectives associated with the impacts of anthropogenic sound (\$5.2M), which reflects the Navy's concern regarding sonar, and BOEM's with seismic surveys. Expenditures for Fishery Impacts were \$2.4M, which is somewhat surprising given that fisheries bycatch is widely acknowledged as the largest source of direct mortality and serious injury for marine mammals.

With regard to the objective categories, Population Dynamics and Stock Assessment ranked first with direct expenditures of 22.9M, which accounted for 23 percent of the \$92.5M in direct project expenditures (Figure 4, Table 8). Within this category, 55 percent of expenditures were directed toward Distribution and Movements, Population Size/Abundance, and Trends (Table 9). Another 35 percent was directed toward Vital Rates, Population Dynamics, and Stock Assessment. The last 10 percent was devoted to studies of Population Structure, Genetics and Stock Delineation.

The second ranked category was Conservation, Management and Policy, with direct expenditures of \$13.9M. Within this category, expenditures were spread widely, with Monitoring accounting for 27 percent, Conservation and Population Protection/Recovery 31 percent, and several management objectives accounting for 37 percent (Table 9).

The Ecology objectives category garnered \$14.0M in direct expenditures with two objectives, Habitat Use and Habitat Characterization, amounting to 38 percent of the total, with a wide range of other ecological studies accounting for most of the rest of the expenditures. Expenditures for Traditional Ecological Knowledge amounted to just \$270K (Table 9).

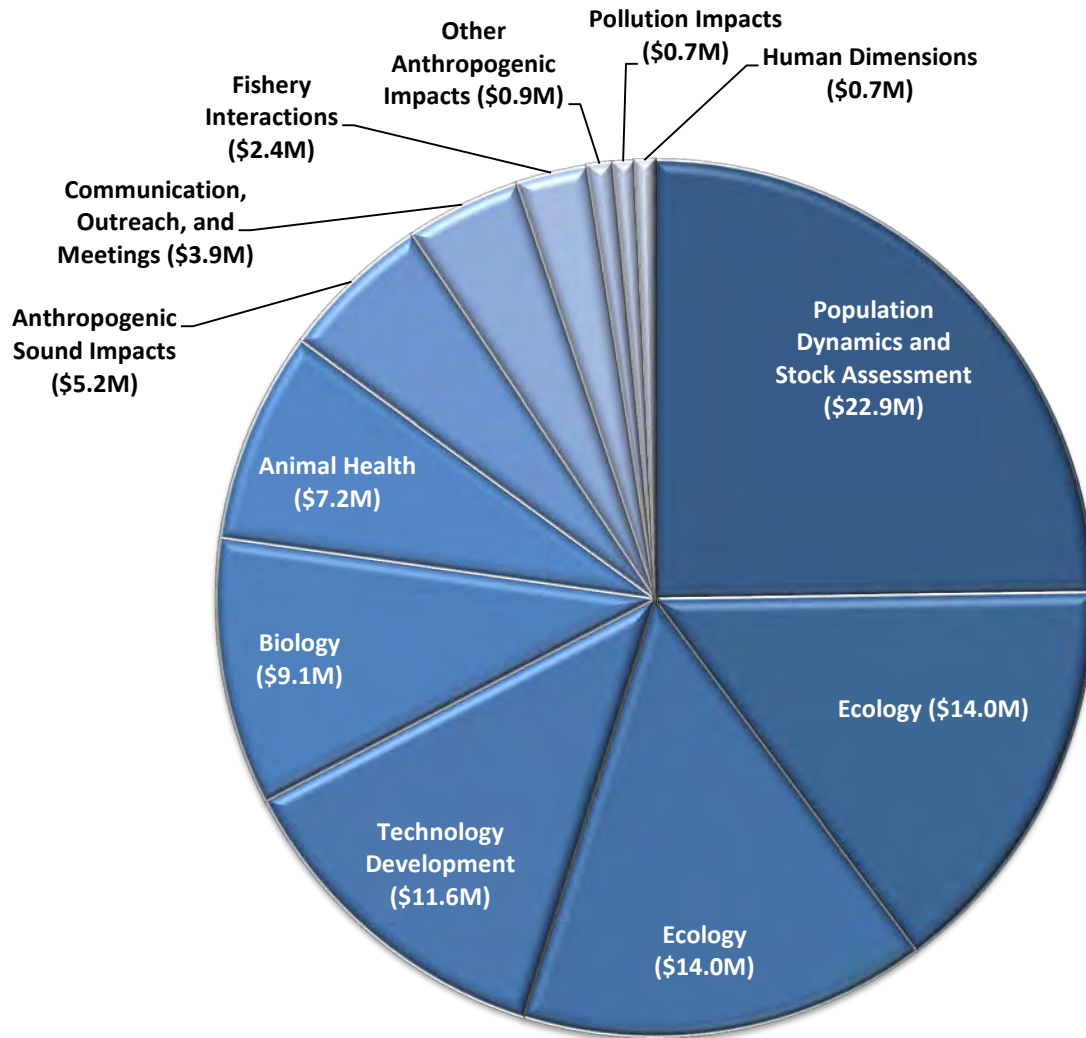


Figure 4. Fiscal year 2014 project expenditures reported by project objective.

Technology Development accounted for \$11.6M in direct expenditures, which were spread fairly evenly across several objectives (Table 9). The development of algorithms for the Detection, Classification and Location of marine mammal vocalizations, and models/analyses for a variety of purposes received 45 percent of the \$11.6M. The development of various types of devices (e.g., tags, sampling platforms, acoustic devices, cameras, etc.) accounted for another 47 percent of direct expenditures.

General Biology, a traditional and important area of marine mammal research, accounted for \$9.1M in direct expenditures. Diving, Foraging and Feeding Behavior was the largest focus of general biology research, 27 percent of the total, while other behavioral studies accounted for another 15 percent. Physiology, Endocrinology, Neurology research received 20 percent, while Genetics and Taxonomy accounted for another 18 percent (Table 9). Studies of the production and reception of sound by cetaceans accounted for another 17 percent.

Table 8. Fiscal year 2014 direct expenditures reported by categories of project objectives.		
Objective Category	Funding (millions)	Percent of total
Populations Dynamics and Stock Assessment	22.9	25
Conservation, Management and Policy	13.9	15
Ecology	14.0	15
Technology Development	11.6	13
Biology	9.1	10
Animal Health	7.2	8
Anthropogenic Sound Impacts	5.2	6
Communication, Outreach, and Meetings	3.9	4
Fishery Interactions	2.4	3
Other Anthropogenic Impacts	0.88	1
Pollution Impacts	0.73	1
Human Dimensions	0.69	1
<b>Total</b>	<b>92.5</b>	<b>100</b>

Expenditures for Animal Health totaled \$7.2M. Marine Mammal Stranding Response, including necropsies of dead animals and the care and rehabilitation of live strandings received 40 percent of the Animal Health expenditures (Table 9). Various activities involved with assessing and monitoring the condition and health of wild marine mammals accounted for another 44 percent, and studies of Contaminants, Disease and Biotoxins accounted for an additional 16 percent.

Anthropogenic sounds from a variety of sources, such as seismic surveys, military activities and shipping, impact marine mammals directly and affect the suitability of their environments. Projects that addressed Anthropogenic Sound Impacts accounted for \$5.2M in direct project expenditures (Table 9). Studies related to the use of Military Sonar accounted for over half of the total expenditures (54 percent). Studies related to Shipping Noise accounted for another 15 percent, and the impact of Military Explosions accounted for approximately 12 percent. The characterization and analysis of sound budgets accounted for 8% of the total. No other category accounted for more than five percent of the expenditures.

Projects addressing Communication, Outreach and Meeting accounted for \$3.9M in expenditures, with Outreach, Education and Publications receiving 79% of the total, and the remaining expenditures going toward Meetings, Workshops, and Conferences (Table 9).

The impacts of fishing are recognized to be the single largest source of human-related marine mammal mortality and injury. The objectives category, Fisheries Interactions, however, accounted for just \$2.4M in direct expenditures (Table 9), with bycatch projects accounting for most of that amount (76 percent).

A variety of other anthropogenic impacts (\$0.88M) were the subject of other projects (Table 9). Tourism took for 40 percent of the expenditures, Vessel Strikes for 31 percent, and Disturbance for 24 percent.

Projects within the Pollution Impacts category accounted for approximately \$726K, with the bulk of those funds (75 percent) being allocated to studies on Marine Debris and Hydrocarbon Spills and Leaks (Table 9).

Projects in the Human Dimensions category<sup>35</sup> accounted for approximately \$726K in direct expenditures (Table 9). Studies of historic whaling and contemporary subsistence harvesting accounted for approximately 67 percent of those expenditures, while projects focused on the interactions between growing populations of Marine Mammals and Coastal Communities accounted for another 22 percent. Social Science and Economics studies garnered 12 percent of the total project expenditures in this category.

Project objective		Funding (millions)	Percent of sub-total
Population Dynamics and Stock Assessment	Distribution and movements	5.6	24
	Size / abundance	4.7	21
	Vital rates	3.4	15
	Population dynamics	2.6	12
	Trends	2.3	10
	Stock assessment	1.9	8
	Population delineation	1.2	5
	Population structure	1.1	5
	<b>Sub-total</b>	<b>22.9</b>	<b>100</b>
Conservation, Management, and Policy	Monitoring	3.8	27
	Conservation	2.6	18
	Population protection / recovery	1.8	13
	Management	1.6	11
	Co-management	1.2	9
	Regulatory compliance	0.94	7
	Surveillance / enforcement	0.78	6
	Others	1.3	9
	<b>Sub-total</b>	<b>13.9</b>	<b>100</b>
Ecology	Habitat use	4.0	29
	Trophic interactions	2.7	20
	Behavioral ecology	2.4	17
	Ecosystems	2.0	14
	Population ecology	1.3	10
	Habitat characterization	1.2	9
	Traditional knowledge	0.27	2
	<b>Sub-total</b>	<b>14.0</b>	<b>100</b>

<sup>35</sup> Whaling and subsistence harvesting, marine mammals and coastal communities, social science, and economics



Table 9 (continued)			
Project objective		Funding (millions)	Percent of sub-total
Technology Development	Acoustic detection, classification & location	2.5	22
	Models	1.5	13
	Sampling platforms	1.5	13
	Acoustic devices	1.5	13
	Tags/telemetry devices	1.1	9
	Database design / maintenance / archiving	0.79	7
	Cameras	0.71	6
	Others	2.0	17
	<b>Sub-total</b>	<b>11.6</b>	<b>100</b>
General Biology	Behavior – diving / foraging / feeding	2.5	27
	Physiology / endocrinology / neurology / etc.	1.8	20
	Genetics / taxonomy	1.6	18
	Bioacoustics – sound production	1.0	11
	Behavior – kinematics	0.72	8
	Behavior – Social / Reproductive	0.62	7
	Bioacoustics – sound reception	0.47	5
	Others	0.36	4
	<b>Sub-total</b>	<b>9.1</b>	<b>100</b>
Animal Health	Stranding response	2.0	27
	Monitoring/assessment	1.1	16
	Body condition	0.93	13
	Care and rehabilitation	0.73	10
	Sample collection	0.72	10
	Contaminants	0.51	7
	Others	1.3	17
	<b>Sub-total</b>	<b>7.2</b>	<b>100</b>
Anthropogenic Sound Impacts	Military activities – sonar	2.8	54
	Industrial activity – shipping	0.75	15
	Military activities – explosions	0.62	12
	Characterization/Analysis of sound budgets	0.40	8
	Others	0.58	11
	<b>Sub-total</b>	<b>5.2</b>	<b>100</b>

Table 9 (continued).			
Project objective		Funding (millions)	Percent of sub-total
Communication, Outreach and Meeting	Outreach	1.5	38
	Education	0.86	22
	Meetings/workshops/conferences	0.84	21
	Publications	0.76	19
	<b>Sub-total</b>	<b>3.9</b>	<b>100</b>
Fishery Interactions	Bycatch <sup>36</sup>	1.9	76
	Depredation	0.39	16
	Indirect fishery interactions	0.18	8
	<b>Sub-total</b>	<b>2.4</b>	<b>100</b>
Other Anthropogenic Impacts	Tourism <sup>37</sup>	0.41	40
	Vessel strikes	0.35	31
	Disturbance	0.21	24
	Others	<0.10	5
	<b>Sub-total</b>	<b>0.88</b>	<b>100</b>
Pollution Impacts	Marine debris	0.27	38
	Hydrocarbon spills/leaks	0.27	38
	Others	0.18	24
	<b>Sub-total</b>	<b>0.73</b>	<b>100</b>
Human Dimensions	Whaling / subsistence harvesting	0.67	67
	Marine mammals and coastal communities	0.22	22
	Others	<0.10	11
	<b>Sub-total</b>	<b>0.69</b>	<b>100</b>
<b>Total</b>		<b>92.5</b>	

### Species and Species Groupings

One hundred and ten species were listed as at least the partial focus of one or more projects. Roughly half of all projects (263) focused on just one species, and another 25 percent listed two to five species as the targets of the project. Thirty projects listed 6-10 species, and 25 listed 11-20. In contrast, because surveys of the distribution and abundance of marine mammals and stranding programs are a standard part of the activities of several agencies, sixty projects (12 percent of the total) listed over 20 species.

<sup>36</sup> Four objectives combined: Bycatch – Mitigation, Bycatch – Gill Net / Pot Gear entanglement, Bycatch – Other Fishing Gear, and Entanglement Response

<sup>37</sup> Two objectives combined: Tourism – Observing (e.g., whale watching), and Tourism – Swim-With/Feeding

Almost all species were listed as the focus of multiple projects. Only five species<sup>38</sup> were listed on three or fewer projects. At the other end of the spectrum, five species – humpback, fin, blue and sperm whale, and Atlantic bottlenose dolphin – were at least a partial focus of more than 20 percent of the projects.

The 53 projects that were not focused on any particular species and were potentially applicable to all species accounted for \$5.8M in direct expenditures by federal agencies in fiscal year 2014. Examples of such projects are:

- A literature review of the effects of noise on marine mammals;
- Development of an acoustic recorder;
- Establishing a data portal and visualization tool for telemetry data;
- A review of stress in marine mammals;
- Diagnostic methods and tools for assessing the effects of contaminants and pathogens;
- Development of guidelines for marine mammal natural resource damage assessments;
- Support for a conference of the International Association of Aquatic Animal Medicine; and
- Support for a workshop on the current status and future of underwater hearing research.

Fifty-seven species received over \$200K in direct expenditures (Table 10), and 14 of those species had expenditures of over \$2.0M each (Figure 5), including six baleen whale species (humpback, North Atlantic right, bowhead, fin, blue and gray), three pinniped species (Steller sea lion, walrus, and Hawaiian monk seal), Atlantic bottlenose dolphins, polar bears, West Indian manatees, Cuvier's beaked whales and killer whales.

Fiscal year 2014 funding by various taxonomic or ecological groups is presented in Figure 6. Of the \$86.8M that was directed at, or associated with, particular species or species groups, \$28.1M (32 percent) went to odontocetes (dolphins, beaked whales, sperm whales,<sup>39</sup> monodontids,<sup>40</sup> and porpoises), \$25.7M (30 percent) to the pinnipeds (true and eared seals, and walrus), \$25.6M (29 percent) to baleen whales (rorquals,<sup>41</sup> right whales,<sup>42</sup> and the gray whale), \$5.0M (6 percent) to the polar bear and sea otter combined, and \$2.4M (3 percent) to sirenians (manatees and dugongs). Within the odontocete group, ocean dolphins (delphinids) received \$15.0M (53 percent of total funding for odontocetes), beaked whales \$7.9M (28 percent), sperm whales \$2.8M (10 percent), monodontids (beluga whale and narwhal) \$1.5M (5 percent), porpoises \$0.95M (3 percent, and river dolphins <\$100K (<1 percent). Within the baleen whales, rorquals received \$15.4M (60 percent of the baleen whale total), right whales received \$8.2M (32 percent), and the gray whale \$2.0M (8 percent) (Table 10).

<sup>38</sup> Dugong, South African fur seal, Amazonian manatee, West African manatee, and Weddell seal

<sup>39</sup> Sperm whale, pygmy sperm whale and dwarf sperm whale

<sup>40</sup> Beluga and narwhal

<sup>41</sup> Humpback, blue, fin, sei, minke, and Brydes whales

<sup>42</sup> North Atlantic, North Pacific, Southern and pygmy right whale

Table 10. Marine mammal species with a minimum of \$200K in direct project expenditures reported in fiscal year 2014.

Species	Funding (millions)	Species	Funding (millions)
Humpback whale	6.7	Short-finned pilot whale	0.95
Steller sea lion	5.4	Sei whale	0.89
North Atlantic right whale	4.5	Northern elephant seal	0.71
Walrus	4.1	Northern bottlenose whale	0.70
Hawaiian monk seal	3.8	Pygmy sperm whale	0.69
Atlantic bottlenose dolphin	3.6	Dwarf sperm whale	0.67
Polar bear	3.4	Short-beaked common dolphin	0.62
Fin whale	3.3	Spinner dolphin	0.57
Bowhead whale	3.3	Long-finned pilot whale	0.57
West Indian manatee	2.4	Harbor porpoise	0.51
Blue whale	2.3	Bryde's whale	0.49
Cuvier's beaked whale	2.3	Melon-headed whale	0.48
Gray whale	2.0	Pantropical spotted dolphin	0.47
Killer whale	2.0	Narwhal	0.47
Harbor seal	1.9	Striped dolphin	0.42
Northern fur seal	1.8	Rough-toothed dolphin	0.39
Ribbon seal	1.6	Pygmy killer whale	0.38
Spotted seal	1.6	Weddell seal	0.37
Blainville's beaked whale	1.6	Gervais' beaked whale	0.35
Minke whale	1.6	Long-beaked common dolphin	0.34
Sea otter	1.6	Pacific white-sided dolphin	0.30
Sperm whale	1.5	Fraser's dolphin	0.28
Ringed seal	1.3	Gray seal	0.26
Bearded seal	1.3	Vaquita	0.24
California sea lion	1.2	Atlantic spotted dolphin	0.24
Baird's beaked whale	1.2	White-beaked dolphin	0.24
Risso's dolphin	1.1	North Pacific right whale	0.23
Beluga whale	1.0	Longman's beaked whale	0.22
False killer whale	1.0	Remaining 53 species	3.3
		<b>Total</b>	<b>86.8</b>

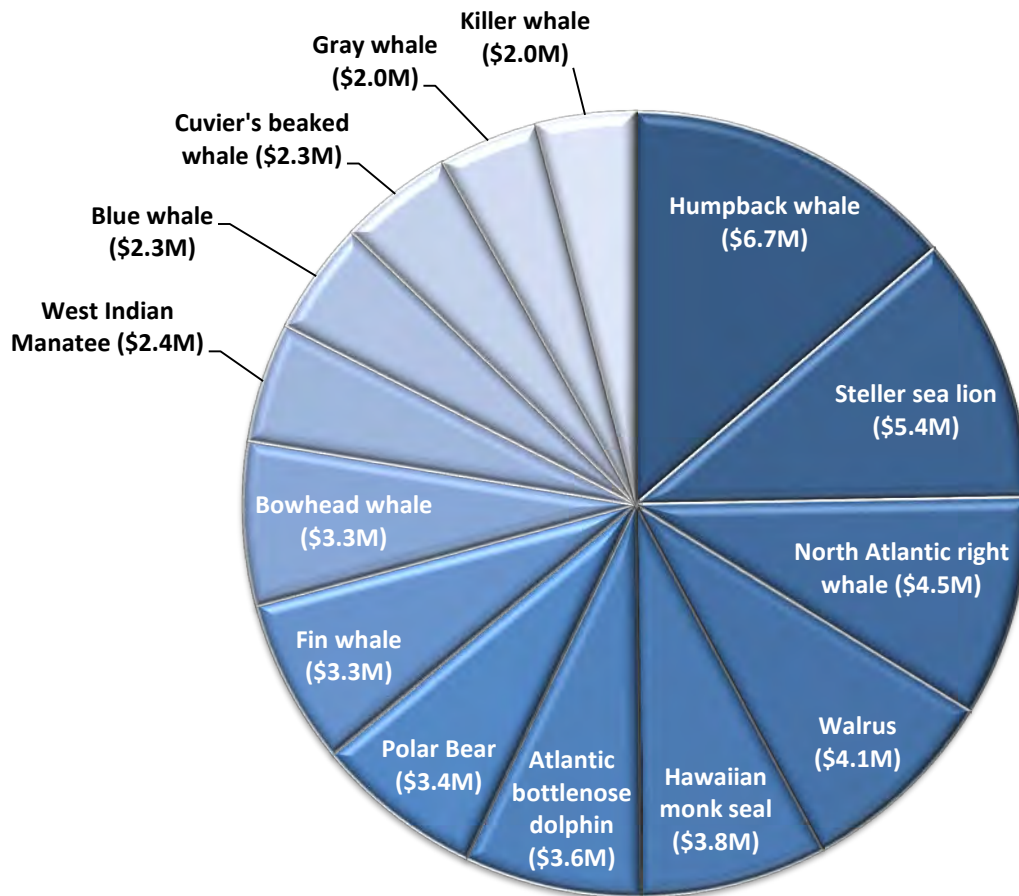


Figure 5. Species with more than \$2.0M in direct project expenditures reported in fiscal year 2014.

### Conservation Status

Marine mammal conservation status is designated by NOAA Fisheries and the FWS in accordance with the provisions of the ESA and MMPA. The ESA defines a species as endangered if it is “in danger of extinction within the foreseeable future throughout all or a significant portion of its range” or threatened if it is “likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.” The MMPA defines a marine mammal “species or population stock [that] is below its optimal sustainable population level” as depleted. It defines a strategic marine mammal stock as one:

- (A) “for which the level of direct human caused mortality exceeds the potential biological removal level;
- (B) “which, based on the best available scientific information, is declining and is likely to be listed as a threatened species under the Endangered Species Act of 1973 ... within the foreseeable future; or
- (C) “which is listed as a threatened species or endangered species under the Endangered Species Act of 1973 ... or is designated as depleted... .”

Thus, any species listed as endangered or threatened under the ESA also will be designated as depleted and categorized as strategic under the MMPA, and any species designated as depleted will be categorized as strategic. However, not every species with one or more strategic stocks will necessarily be designated as depleted or listed as threatened or endangered.

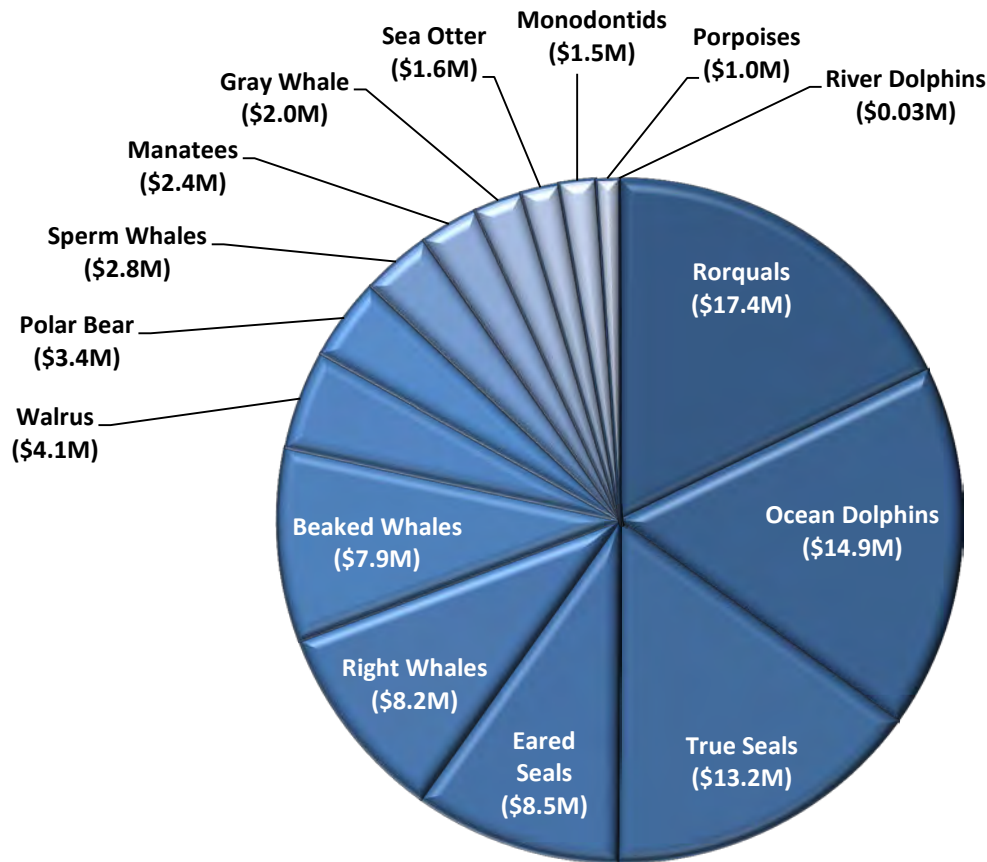


Figure 6. Fiscal year 2014 direct project expenditures reported by taxonomic or ecological grouping.<sup>43</sup>

<sup>43</sup> Ocean dolphins are dolphins and small toothed whales of the family Delphinidae. The rorquals belong to the family Balaenopteridae. The true and eared seals are members of the families Phocidae and Otariidae, respectively. The beaked whales are members of the family Ziphiidae. The right whales include the members of the families Balaenidae and Neobalaenidae. The walrus is the sole member of the family Odobenidae. The polar bear is the only member of the family Ursidae that is considered a marine species. The sperm whales include the sperm whale, which is the sole member of the family Physeteridae, and the dwarf and pygmy sperm whales, which are members of Kogiidae, a closely related family. The manatees are members of the family Trichechidae within the order Sirenia; included in this grouping is the dugong, which is the sole living member of the other family within the Sirenia, Dugongidae. The gray whale is the sole species in the family Eschrichtiidae. The sea otter is the sole marine member of the family Mustelidae, for which any data were reported. The monodontids, narwhal and beluga whale, are members of the family Monodontidae. The porpoises are members of the family Phocoenidae. The river dolphins, which are linked by the habitat they occupy, belong to one of four families: Iniidae, Lipotidae, Pontoporiidae, and Platanistidae.

In fiscal year 2014, federal agencies allocated \$86.8M in direct expenditures for research and/or conservation projects focused on particular species. Of this total, 66 percent (\$57.3M) was directed toward, or associated with, species listed as endangered or threatened, or designated as depleted or categorized as strategic (Figure 7). Species or stocks in this grouping included several that are at small population sizes and/or declining, such as Steller sea lion (\$5.4M), North Atlantic right whale (\$4.5M), Hawaiian monk seal (\$3.8M), killer whale (\$2.0M), Northern fur seal (\$1.7M), and sea otter (\$1.6M).

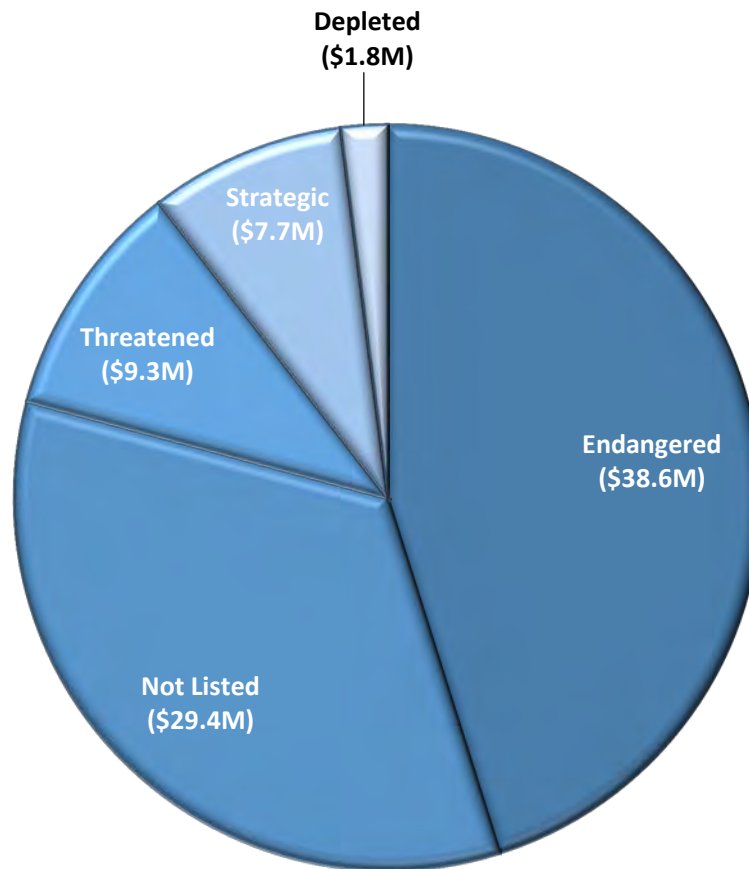


Figure 7. Fiscal year 2014 direct project expenditures reported by species' ESA and MMPA conservation status.<sup>44</sup>

Funding ranged from about \$0.89M to \$6.7M dollars for each of the 18 most highly funded species listed as endangered or threatened under the ESA, or designated as depleted or strategic under the MMPA. Funding for those 18 species totaled \$47.3M (average \$2.4M) compared to \$585K (average \$65K) for the remaining nine listed/designated species. The other 34 percent (\$29.4M) of direct expenditures that was focused on particular species was directed toward, or associated with, species not listed or designated in one of these

<sup>44</sup> The Strategic category does not include those stocks that are categorized as strategic automatically because they are listed as endangered or threatened under the ESA, only those not listed but categorized as strategic under the MMPA because the stock is declining and its rate of direct human-caused mortality exceeds its PBR.



categories. The species in this grouping that had substantial expenditures, typically because of their importance to coastal communities or susceptibility to human impacts, included the bottlenose dolphin \$3.6M, Cuvier's beaked whale \$2.3M, gray whale \$2.0, harbor seal \$1.9M, Blainville's beaked whale \$1.6M, California sea lion \$1.2M, and beluga whale \$1.0M. However, not all species of importance to coastal communities or susceptible to human impacts received expenditures as substantial as these. For example, direct expenditures of \$510K were directed toward harbor porpoises, and \$257K toward harbor porpoises.

Expenditures for several Arctic species, which are important to Native communities and very susceptible to climate change impacts, were substantial (e.g., walrus \$4.1M, bowhead whale \$3.3M, spotted seal \$1.6M, bearded seal \$1.3M, and ringed seal \$1.3M).

To further illustrate the variation in expenditures, for endangered large whales the combined funding for humpback, North Atlantic right, bowhead, fin, blue and sperm whales averaged \$3.6M per species (\$21.6M in total; individual funding ranged from \$1.5M to \$6.7M), whereas that for the two remaining U.S. species – sei and North Pacific right whales – averaged \$0.56M per species (\$1.1 in total; individually \$893K and \$228K, respectively).

## Geographic Region

Survey respondents identified the geographic regions within which each project operated or was relevant to the project. The options for geographic regions included the coastal Large Marine Ecosystems and large open ocean areas (Appendix C). Forty-nine Large Marine Ecosystems (LMEs) or open ocean areas were selected by respondents across the whole survey, amounting to \$84.2M in direct project expenditures. The 14 LMEs and open ocean areas with the greatest funding accounted for 94 percent of the total expenditures (Figure 8). The combined total for the U.S. Arctic LMEs<sup>45</sup> captured the largest portion of the funding (31 percent, \$25.4M). Two adjacent areas – the Gulf of Alaska LME and the Northwest Pacific Ocean – accounted for another seven percent (\$5.5M). The single LME with the largest expenditures was the California Current (16% of the total; \$13.4M); the adjacent Northeast Pacific Ocean area accounted for another nine percent (\$7.4M) of the expenditures. Further to the west and south, the Insular Pacific – Hawaiian LME accounted for an additional 11 percent (\$9.5M) of the expenditures. Expenditures in the Northeast U.S. Continental Shelf LME accounted for 13 percent (\$10.7M) of the total, and the adjacent Northwest Atlantic Ocean area another two percent (\$2.0M). The Southeast U.S. Continental Shelf, Gulf of Mexico and Caribbean LMEs accounted for 11 percent (\$9.2) combined in direct project expenditures.

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<sup>45</sup> Chukchi Sea, Beaufort Sea, East Bering Sea and West Bering Sea LMEs

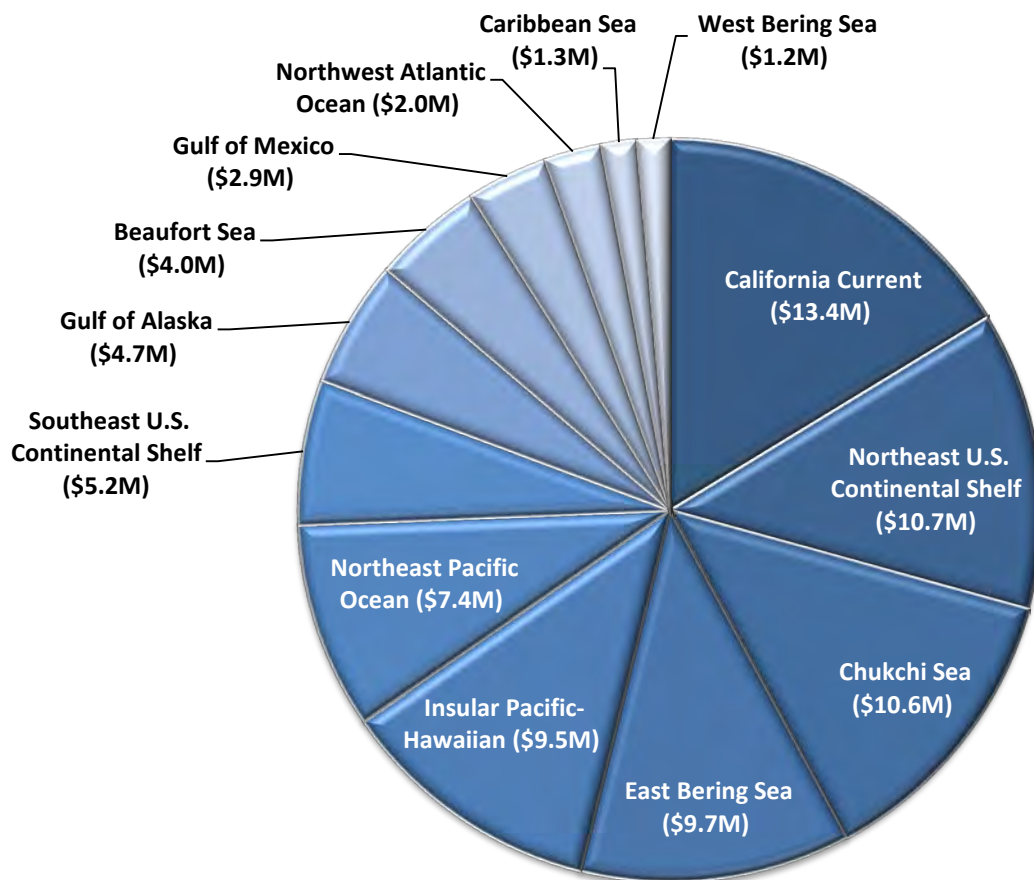


Figure 8. Fiscal year 2014 direct project expenditures reported by geographic location – Large Marine Ecosystems and open-ocean areas.

## Discussion

The main purpose of this survey and report is to provide information to federal agencies, individually and as a community, to help ensure the wisest use of limited resources for marine mammal research and conservation. The Commission intends that this report, and those that follow, assist agencies in 1) matching their resources to their needs and responsibilities (i.e., setting priorities and distributing funds accordingly), and 2) identifying areas where they may better coordinate within and among agencies. The Commission also believes that this and subsequent reports will provide a useful long-term record of federal resources allocated to marine mammal research and conservation.

The survey results provide an informative overview of the total amount of federal funding being used for marine mammal research and conservation. The results also provide a useful overview of the agencies contributing to that funding, their objectives, the distribution of the funding by region within agencies, the target species and species groups, and the conservation status of those species. The general information in the body of the report can be examined in more detail in the companion document,<sup>46</sup> which lists the individual projects reported. That information should be useful for representatives of federal and state agencies, Congress, academic organizations, non-governmental conservation organizations, industries, American Natives, and the public who wish to learn more about the resources being directed toward marine mammal research and conservation. The detailed information in the companion document also should give interested parties insights into how federal agencies might work together or form partnerships with other organizations (e.g., academia, industries) to address important research and conservation challenges.

The results will undoubtedly prompt the question of whether the total resources being directed toward marine mammal research and conservation are sufficient and are being used in the best possible way. By itself, this survey was not designed to address those questions. Indeed, answering those questions will require considerably more information about the threats to species and their habitat; their risks of decline, extirpation, or extinction; and the types of action needed to resolve research and conservation challenges.

## Next Steps

Although the Commission has made important changes and improvements to the design of the survey and the online survey tool, additional effort is needed to improve agencies' and respondents' understanding of the survey and to improve the consistency of data gathering and completeness. Doing so means learning more about the various ways agencies use and account for their resources.

Some issues to be addressed include—

- *Consistency in defining projects* — The number of projects supported or conducted by an agency is an imprecise measure of research and conservation effort because projects vary from the activities of a single person with few resources, to much larger projects involving multiple personnel and

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<sup>46</sup> "Survey of Federally Funded Marine Mammal Research and Conservation – Fiscal Year 2014 – Project Details" (available at <http://www.mmc.gov/letters-and-reports/reports/project-and-workshop-reports/>)

disciplines and requiring substantial resources such as vessels, aircraft, or extensive laboratory facilities. In several cases, and in more than one agency, respondents entered entire programs as a single project when the survey design called for those activities to be entered as a series of projects.

- *Making up the program* — Such disparities should not have affected the overall funding estimates, but do affect the amount and resolution of information available, and its resolution for apportioning funds among species, taxonomic groups, species' status, regions, and project objectives.
- *Apportioning funds among objectives, species and locations* — The survey asks respondents who select more than one objective, species/stock or location for a project to apportion the funding for that project among the choices they made. The Commission will be gathering feedback from respondents to assess which methods for estimating apportionment were the most useful.
- *Overlap in objectives* — For the first time, with the fiscal year 2014 survey, the Commission asked agencies to estimate their total marine mammal funding for each of the administrative units that conducted or funded such work. In the absence of difficult and time-consuming accounting to estimate indirect costs, estimates of unit funding were often back-of-the envelope calculations made by the agencies. The Commission will be seeking feedback from the agencies on which methods worked the best, and will use that information to refine future surveys.
- *Incomplete reporting* — The lack of responses from a small set of agencies adds a source of bias to the amounts reported here as well as to the overall analyses and results. For instance, the lack of response from the Department of State means that funding for international marine mammal research and conservation is under-reported. Some agencies were able to report on work from some, but not all, of their units, and there is no doubt that some projects related to marine mammals were overlooked. The Commission will be working with agencies to improve the coverage of the survey in coming years.

## **Acknowledgements**

The Marine Mammal Commission greatly appreciates the efforts of participating federal agencies to provide accurate information on their marine mammal activities and funding. The Commission also gratefully acknowledges the time and effort contributed to the survey by the coordinators and respondents from those agencies. In addition, the Commission is thankful for agency comments on this and previous surveys, which have improved the survey and its usefulness substantially. Comments on this report are welcome and should be submitted to the Commission at [surveyffr@mmc.gov](mailto:surveyffr@mmc.gov).

## Appendix A

### Departments, Agencies and Offices

This table lists the federal departments, agencies within departments, and offices within agencies that responded to the survey, along with their total funding and the number of projects they reported.

Department Agency Office	Number of Projects	Total Funding
<b>Department of Commerce</b>	<b>162</b>	<b>\$71,215,173</b>
<b>National Ocean Service</b>	<b>22</b>	<b>\$4,272,200</b>
Channel Islands National Marine Sanctuary	3	\$330,000
Cordell Bank National Marine Sanctuary	2	\$162,000
Gray's Reef National Marine Sanctuary	1	\$1,500
Greater Farallones National Marine Sanctuary	2	\$223,806
Hawaiian Islands Humpback Whale National Marine Sanctuary	1	\$1,612,200
Monterey Bay National Marine Sanctuary	2	\$8,000
National Centers for Coastal Ocean Science	5	\$826,669
Office of National Marine Sanctuaries	0	\$534,025
Papahānaumokuākea National Marine Sanctuary	2	\$300,000
Stellwagen Bank National Marine Sanctuary	4	\$274,000
<b>NOAA Fisheries</b>	<b>129</b>	<b>\$66,197,169</b>
Alaska Fisheries Science Center	7	\$13,241,217
Alaska Regional Office	19	\$11,055,471
Greater Atlantic Regional Fisheries Office	5	\$3,591,254
Northeast Fisheries Science Center	8	\$5,576,569
Northwest Fisheries Science Center	4	\$1,562,089
Office of International Affairs	0	\$513,755
Office of Protected Resources	41	\$9,056,992
Office of Science and Technology	2	\$349,217
Pacific Islands Fisheries Science Center	4	\$4,274,229
Pacific Islands Regional Office	11	\$2,196,728
Southeast Fisheries Science Center	4	\$3,106,519
Southeast Regional Office	12	\$3,096,303
Southwest Fisheries Science Center	6	\$5,315,774
West Coast Regional Office	6	\$3,261,052
<b>NOAA Research</b>	<b>11</b>	<b>\$781,804</b>
Sea Grant Program Office	11	\$781,804
<b>Department of Defense</b>	<b>188</b>	<b>\$32,972,417</b>
<b>Department of the Navy</b>	<b>180</b>	<b>\$29,016,230</b>
Atlantic Fleet	7	\$3,350,000
Living Marine Resources Program	14	\$6,598,000
Naval Air Systems Command	1	\$625,000

Department Agency Office	Number of Projects	Total Funding
<b>Department of Defense (continued)</b>		
<b>Department of the Navy (continued)</b>		
Naval Sea Systems Command	2	\$490,000
Office of Naval Research	140	\$12,628,735
Pacific Fleet - Hawaii & Marianas	5	\$2,063,782
Pacific Fleet - West Coast	11	\$3,260,713
<b>Environmental Research Programs</b>	<b>6</b>	<b>\$2,115,499</b>
Environmental Security Technology Certification Program	2	\$367,600
Strategic Environmental Research and Development Program	4	\$1,747,899
<b>U.S. Army Corps of Engineers</b>	<b>2</b>	<b>\$1,840,688</b>
Alaska District	0	\$307,366
Charleston District	0	\$48,505
Galveston District	0	\$6,111
Honolulu District	0	\$34,740
Jacksonville District	1	\$1,043,833
Los Angeles District	0	\$2,020
Mobile District	0	\$40,069
New England District	0	\$33,655
New Orleans District	0	\$2,914
New York District	0	\$136,000
Norfolk District	0	\$3,420
Philadelphia District	0	\$1,800
Savannah District	1	\$97,399
Seattle District	0	\$49,256
Wilmington District	0	\$33,600
<b>Department of Energy</b>	<b>8</b>	<b>\$2,554,190</b>
<b>Office of Energy Efficiency &amp; Renewable Energy</b>	<b>8</b>	<b>\$2,554,190</b>
Wind and Water Power Technologies Office	8	\$2,554,190
<b>Department of Health &amp; Human Services</b>	<b>4</b>	<b>\$594,298</b>
<b>National Institutes of Health</b>	<b>4</b>	<b>\$594,298</b>
National Institute of Deafness and Other Communication Disorders	2	\$349,607
National Institute of Environmental Health Sciences	2	\$244,691
<b>Department of Homeland Security</b>	<b>2</b>	<b>\$1,176,093</b>
<b>U.S. Coast Guard</b>	<b>2</b>	<b>\$1,176,093</b>
Living Marine Resources - Atlantic Area	1	\$342,948
Living Marine Resources - Pacific Area	1	\$833,145
<b>Department of the Interior</b>	<b>116</b>	<b>\$20,778,926</b>
<b>Bureau of Ocean Energy Management</b>	<b>22</b>	<b>\$7,130,310</b>
Alaska Outer Continental Shelf Region	11	\$6,671,301
Atlantic Outer Continental Shelf Region	3	\$419,009
Gulf of Mexico Outer Continental Shelf Region	3	\$15,000



Department Agency Office	Number of Projects	Total Funding
<b>Department of the Interior (continued)</b>		
<b>Bureau of Ocean Energy Management (continued)</b>		
'Headquarters' (multiple OCS regions)	3	\$15,000
Pacific Outer Continental Shelf Region	2	\$10,000
<b>Bureau of Safety and Environmental Enforcement</b>	<b>2</b>	<b>\$322,422</b>
Environmental Enforcement Division	2	\$322,422
<b>National Park Service</b>	<b>6</b>	<b>\$89,400</b>
Cape Cod National Seashore	3	\$0
Cape Hatteras National Seashore	1	\$4,400
Point Reyes National Seashore	2	\$85,000
<b>U.S. Fish &amp; Wildlife Service</b>	<b>36</b>	<b>\$6,508,718</b>
Alaska Maritime National Wildlife Refuge	1	\$2,500
Crystal River National Wildlife Refuge	1	\$880,000
Ecological Services Program - Caribbean Office	3	\$135,300
Ecological Services Program - Headquarters	0	\$383,694
Ecological Services Program - North Florida Office	2	\$668,000
Ecological Services Program - Region 4 (Southeast and Gulf of Mexico)	2	\$55,000
Ecological Services Program - Region 8 (California)	1	\$34,542
Ecological Services Program - Texas Coast Office	2	\$30,600
Ecological Services Program - Ventura Office	2	\$220,000
Ecological Services Program - Washington Office	1	\$78,092
Farallon National Wildlife Refuge	1	\$33,263
International Affairs Program - Permits	1	\$94,000
Marine Mammals Management Office	17	\$3,887,782
Oregon Coast National Wildlife Refuge	2	\$5,945
<b>U.S. Geological Survey</b>	<b>50</b>	<b>\$6,728,076</b>
Alaska Science Center	17	\$3,559,188
Fort Collins Science Center	4	\$58,404
Headquarters	4	\$1,013,403
Leetown Science Center	1	\$145,600
National Wildlife Health Center	1	\$3,936
Patuxent Wildlife Research Center	5	\$153,500
Southeast Ecological Science Center	13	\$1,121,262
Western Ecological Science Center	5	\$672,783
<b>Independent Agencies</b>	<b>24</b>	<b>\$4,383,292</b>
<b>Marine Mammal Commission</b>	<b>15</b>	<b>\$3,250,000</b>
<b>National Science Foundation</b>	<b>9</b>	<b>\$1,133,292</b>
Geosciences Directorate	8	\$1,128,222
Office of the Director	1	\$5,070
<b>Total</b>	<b>504</b>	<b>\$134,310,389</b>

## Appendix B

### Common and scientific names

Common and scientific names for marine mammals are included in this report. The list is based on the Society for Marine Mammalogy's "List of Marine Mammal Species and Subspecies."<sup>47</sup> The codes in parentheses are used to indicate that the species does not occur in the U.S. Exclusive Economic Zone around the continental U.S., Alaska, or Hawaii, but rather occurs in foreign (F) or international waters (I), or in the waters of U.S. territories (T).

Common name	Scientific name
Amazon river dolphin (F)	<i>Inia geoffrensis</i>
Amazonian manatee (F)	<i>Trichechus inunguis</i>
Andrew's beaked whale (F)	<i>Mesoplodon bowdoini</i>
Antarctic minke whale (F, I)	<i>Balaenoptera bonaerensis</i>
Arnoux's beaked whale (F, I)	<i>Berardius arnuxii</i>
Atlantic humpback dolphin (F)	<i>Sousa teuszii</i>
Atlantic spotted dolphin	<i>Stenella frontalis</i>
Atlantic white-sided dolphin	<i>Lagenorhynchus acutus</i>
Australian snubfin dolphin (F)	<i>Orcaella heinsohni</i>
Baird's beaked whale	<i>Berardius bairdii</i>
Bearded seal	<i>Erignathus barbatus</i>
Beluga whale	<i>Delphinapterus leucas</i>
Blainville's beaked whale	<i>Mesoplodon densirostris</i>
Blue whale	<i>Balaenoptera musculus</i>
Bowhead whale	<i>Balaena mysticetus</i>
Bryde's whale	<i>Balaenoptera edeni</i>
Burmeister's porpoise (F)	<i>Phocoena spinipinnis</i>
California sea lion	<i>Zalophus californianus/wollebaeki</i>
Chilean dolphin (F)	<i>Cephalorhynchus eutropia</i>
Chinese river dolphin (F)	<i>Lipotes vexillifer</i>
Clymene dolphin	<i>Stenella clymene</i>
Commission's dolphin	<i>Cephalorhynchus commersonii</i>
Common bottlenose dolphin (F)	<i>Tursiops truncatus</i>
Costero (F)	<i>Sotalia guianensis</i>

<sup>47</sup> Available at <https://www.marinemammalscience.org/species-information/list-of-marine-mammal-species-subspecies/>

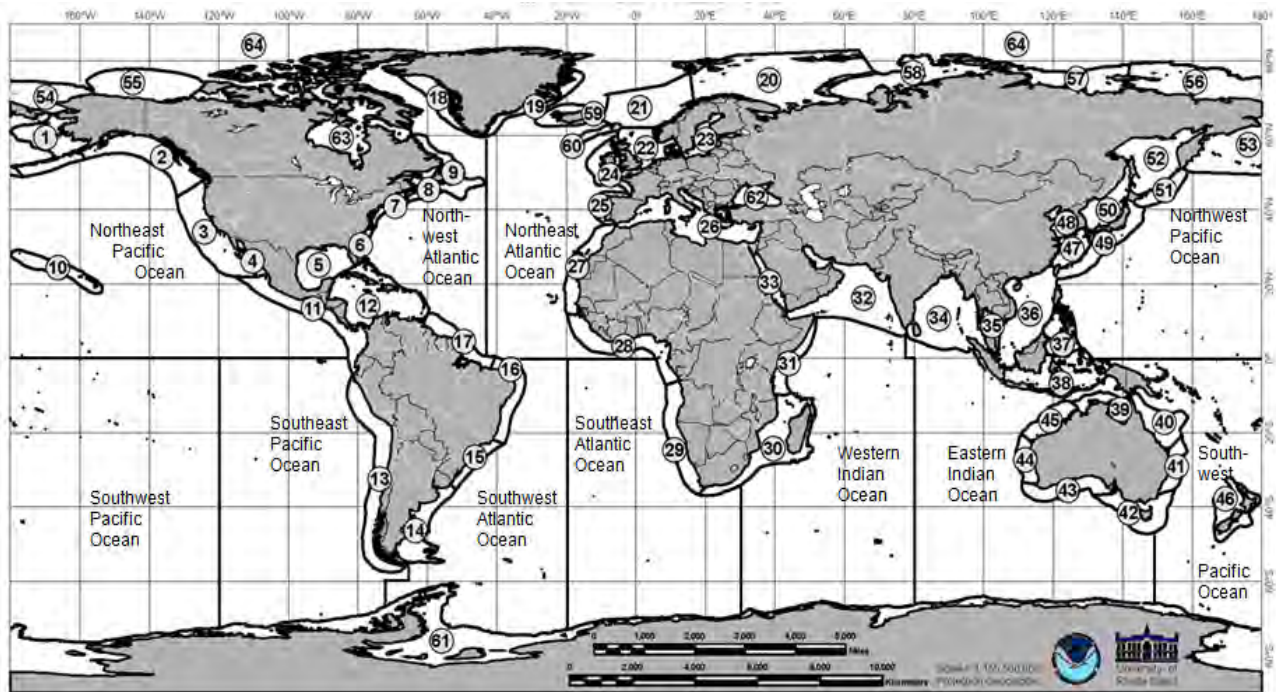
Common name	Scientific name
Cuvier's beaked whale	<i>Ziphius cavirostris</i>
Dall's porpoise	<i>Phocoenoides dalli</i>
Dugong (F)	<i>Dugong dugon</i>
Dwarf sperm whale	<i>Kogia sima</i>
False killer whale	<i>Pseudorca crassidens</i>
Fin whale	<i>Balaenoptera physalus</i>
Finless porpoise (F)	<i>Neophocaena phocaenoides</i>
Franciscana (F)	<i>Pontoporia blainvillei</i>
Fraser's dolphin	<i>Lagenodelphis hosei</i>
Gervais' beaked whale	<i>Mesoplodon europaeus</i>
Ginkgo-toothed beaked whale	<i>Mesoplodon ginkgodens</i>
Gray seal	<i>Halichoerus grypus</i>
Gray whale	<i>Eschrichtius robustus</i>
Gray's beaked whale (F, I)	<i>Mesoplodon grayi</i>
Guadalupe fur seal	<i>Arctocephalus townsendi</i>
Harbor seal	<i>Phoca vitulina</i>
Harbor porpoise	<i>Phocoena phocoena</i>
Harp seal	<i>Pagophilus groenlandicus</i>
Hawaiian monk seal	<i>Monachus schauinslandi</i>
Heaviside's dolphin (F)	<i>Cephalorhynchus heavisidii</i>
Hector's beaked whale (F, I)	<i>Mesoplodon hectori</i>
Hector's dolphin (F)	<i>Cephalorhynchus hectori</i>
Hooded seal	<i>Cystophora cristata</i>
Hourglass dolphin (F, I)	<i>Lagenorhynchus cristata</i>
Hubb's beaked whale	<i>Mesoplodon carlhubbsi</i>
Humpback whale	<i>Megaptera novaeangliae</i>
Indo-Pacific bottlenose dolphin (F)	<i>Tursiops aduncus</i>
Indo-Pacific humpback dolphin (F)	<i>Sousa chinensis</i>
Irrawaddy dolphin (F)	<i>Orcaella brevirostris</i>
Killer whale	<i>Orcinus orca</i>
Long-beaked common dolphin	<i>Delphinus capensis</i>
Long-finned pilot whale	<i>Globicephala melas</i>
Longman's beaked whale	<i>Indopacetus pacificus</i>
Melon-headed whale	<i>Peponocephala electra</i>
Minke whale	<i>Balaenoptera acutorostrata</i>

Common name	Scientific name
Narwhal	<i>Monodon monoceros</i>
North Atlantic right whale	<i>Eubalaena glacialis</i>
North Pacific right whale	<i>Eubalaena japonica</i>
Northern bottlenose whale	<i>Hyperoodon ampullatus</i>
Northern elephant seal	<i>Mirounga angustirostris</i>
Northern fur seal	<i>Callorhinus ursinus</i>
Northern right whale dolphin	<i>Lissodelphis borealis</i>
Omura's whale (F, I)	<i>Balaenoptera omurai</i>
Pacific white-sided dolphin	<i>Lagenorhynchus obliquidens</i>
Pantropical spotted dolphin	<i>Stenella attenuata</i>
Peale's dolphin (F, I)	<i>Lagenorhynchus australis</i>
Perrin's beaked whale	<i>Mesoplodon perrini</i>
Polar bear	<i>Ursus maritimus</i>
Pygmy beaked whale	<i>Mesoplodon peruvianus</i>
Pygmy killer whale	<i>Feresa attenuata</i>
Pygmy right whale (F, I)	<i>Caperea marginata</i>
Pygmy sperm whale	<i>Kogia breviceps</i>
Ribbon seal	<i>Histiophoca fasciata</i>
Ringed seal	<i>Pusa hispida</i>
Risso's dolphin	<i>Grampus griseus</i>
Rough-toothed dolphin	<i>Steno bredanensis</i>
Sea otter	<i>Enhydra lutris</i>
Sei whale	<i>Balaenoptera borealis</i>
Shepherd's beaked whale (F, I)	<i>Tasmacetus shepherdi</i>
Short-beaked common dolphin	<i>Delphinus delphis</i>
Short-finned pilot whale	<i>Globicephala macrorhynchus</i>
South African fur seal (F, I)	<i>Arctocephalus pusillus</i>
South Asian river dolphin (F)	<i>Platanista gangetica</i>
Southern bottlenose whale (F, I)	<i>Hyperoodon planifrons</i>
Southern elephant seal (F, I)	<i>Mirounga leonina</i>
Southern right whale (F, I)	<i>Eubalaena australis</i>
Southern right whale dolphin (F, I)	<i>Lissodelphis peronii</i>
Sowerby's beaked whale	<i>Mesoplodon bidens</i>
Spade-toothed beaked whale (F, I)	<i>Mesoplodon traversii</i>

Common name	Scientific name
Spectacled porpoise (F, I)	<i>Phocoena dioptrica</i>
Sperm whale	<i>Physeter macrocephalus</i>
Spinner dolphin	<i>Stenella longirostris</i>
Spotted seal	<i>Phoca largha</i>
Stejneger's beaked whale	<i>Mesoplodon stejnegeri</i>
Steller sea lion	<i>Eumetopias jubatus</i>
Strap-toothed beaked whale (F, I)	<i>Mesoplodon layardii</i>
Striped dolphin	<i>Stenella coeruleoalba</i>
True's beaked whale	<i>Mesoplodon mirus</i>
Tucuxi (F)	<i>Sotalia fluviatilis</i>
Vaquita (F)	<i>Phocoena sinus</i>
Walrus	<i>Odobenus rosmarus</i>
Weddell seal	<i>Leptonychotes weddellii</i>
West African manatee (F)	<i>Trichechus senegalensis</i>
West Indian manatee	<i>Trichechus manatus</i>
White-beaked dolphin	<i>Lagenorhynchus albirostris</i>

## Appendix C

### Large Marine Ecosystems and Open-Ocean Areas



LMEs / Open Ocean Areas Selected in the Survey	Number of Projects
01. East Bering Sea	44
02. Gulf of Alaska	47
03. California Current	128
04. Gulf of California	5
05. Gulf of Mexico	42
06. Southeast U.S. Continental Shelf	72
07. Northeast U.S. Continental Shelf	68
08. Scotian Shelf	15
09. Newfoundland-Labrador Shelf	5
10. Insular Pacific-Hawaiian	45
12. Caribbean Sea	22
17. North Brazil Shelf	1
18. West Greenland Shelf	5
19. East Greenland Shelf	4
20. Barents Sea	2

LMEs / Open Ocean Areas Selected in the Survey	Number of Projects
21. Norwegian Sea	9
25. Iberian Coastal	3
26. Mediterranean	4
27. Canary Current	2
28. Guinea Current	2
32. Arabian Sea	1
34. Bay of Bengal	1
39. North Australia	1
40. Northeast Australia	3
41. East-Central Australia	1
42. Southeast Australia	1
44. West-Central Australia	2
45. Northwest Australia	2
46. New Zealand Shelf	3
51. Oyashio Current	1
52. Sea of Okhotsk	2
53. West Bering Sea	11
54. Chukchi Sea	47
55. Beaufort Sea	30
56. East Siberian Sea	2
57. Laptev Sea	2
58. Kara Sea	2
59. Iceland Shelf	3
60. Faroe Plateau	1
61. Antarctic	8
63. Hudson Bay	3
64. Arctic Ocean	2
Northeast Atlantic Ocean	5
Northeast Pacific Ocean	16
Northwest Atlantic Ocean	19
Northwest Pacific Ocean	8
Southeast Atlantic Ocean	5
Southwest Pacific Ocean	4
Western Indian Ocean	2
N/A (e.g., all or any areas, or unknown)	76





# Marine Mammal Commission

*An independent agency of the U.S. Government*

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