

SURVEY OF FEDERALLY-FUNDED  
MARINE MAMMAL RESEARCH AND STUDIES  
FY70 - FY80

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Carbondale, Illinois

July 1981

U.S. DEPARTMENT OF COMMERCE  
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## PREFACE

The following review of federally-funded marine mammal research and studies is a reference document presented in tabular form rather than as a continuous text. It is an update of previous surveys compiled by the author.<sup>1</sup> These surveys have been initiated by the Marine Mammal Commission which by direction of the Marine Mammal Protection Act of 1972 is to conduct a continuing review of research programs conducted or proposed to be conducted under the authority of the Act and to undertake or cause to be undertaken such other studies as it deems necessary or desirable in connection with its assigned duties as to the protection and conservation of marine mammals [202 (a)2,3]. Under Sec. 205 of the Act, the Commission is provided access to all studies and data compiled by federal agencies regarding marine mammals so as to ensure that unnecessary duplication of research is avoided and to carry out the purposes of the Act.

The user of this document will find the Table of Contents especially helpful for locating specific information and for understanding the organization and breadth of the material. The first section is an overview of all federally-funded research involving marine mammals. The second section focuses upon research and studies conducted under authority of the Act. The last section list all research projects identified in the FY80 survey.

The data came from two major sources: (1) directly from agency officials at the request of the Marine Mammal Commission and (2) from the Smithsonian Science Information Exchange. More than two dozen U.S. government agency offices were surveyed by the Commission. Principal investigators have on a few occasions supplemented information on their projects. Appendix A is a listing of publications identified by the agencies as sources (or pending sources) of marine mammal information resulting from federally-funded research. Unless otherwise noted, the tables and figures summarize data supplied directly to the Commission by each agency. Appendix B is a listing of all FY80 projects that were identified by the sources.

Agencies vary in their ability to identify and retrieve information on special projects. From year to year, both intra- and interagency variability occurs reducing the accuracy of the data for comparative purposes. Inherent also in such a study is the difficulty of separating administrative costs from costs specifically for data collection and analyses. Generally the funds reported included both cost and must be viewed accordingly.

22 March 1981

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<sup>1</sup> See Waring, G.H. 1981. Survey of federally-funded marine mammal research and studies, FY70-FY79. Final report for MMC contract MM1533588-3. U.S. Dept. Commerce, National Technical Information Service PB81-174336. 235p.

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## I. OVERVIEW OF FEDERAL RESEARCH PROGRAMS INVOLVING MARINE MAMMALS

Fourteen departmental-level federal agencies participated in funding marine mammal research and studies from FY70 through FY80. Some agencies funded projects in all years, whereas others supported studies during only part of the period. Often more than one agency within the larger departments participated in funding research. The Smithsonian Science Information Exchange (SSIE) reported an average of 46.5 projects were funded with federal monies in each of the eleven years (Table 1); nevertheless with the Marine Mammal Commission (MMC) information solicited directly from each agency, the average annual number of projects for FY74-FY80 rose to 142 (Table 2). The trends of these data are depicted in Figure 1. Data for year 76 include the 12-month fiscal year plus a transition quarter (TQ76=July to September 1976) when the first day of the federal fiscal year was shifted from 1 July to 1 October. Total funds expended by each agency for marine mammal research are shown in Table 3. Funding by geographic region, taxonomic group, and research issue are listed in Tables 4, 5, and 6, respectively.

## FEDERAL AGENCIES FUNDING MARINE MAMMAL RESEARCH

Department of Agriculture (USDA)

The Department of Agriculture has conducted studies related to contagious disease organisms associated with marine mammals. The San Miguel sea lion virus has been of special interest. Clinically, the sea lion virus infection resembles the lesions of foot-and-mouth disease in ruminants.

Department of Commerce (DOC)

The Department of Commerce, through the National Marine Fisheries Service (NMFS), conducts marine mammal and fisheries research with emphasis on resource surveys, biological and ecological investigations, and resource management for the use and conservation of living marine resources. The cetaceans and pinnipeds (exclusive of the walrus) are among the responsibilities of this Department. Research funding has been concentrated on the northern fur seal, the incidental take of porpoise in the yellow-fin tuna purse-seine fishery, and whale assessment. In addition, the National Sea Grant Program and other offices in the National Oceanic and Atmospheric Administration (NOAA) have supported studies on marine mammals. OCSEAP (the Outer Continental Shelf Environmental Assessment Program managed by NOAA) was created through interagency agreement between the Bureau of Land Management (BLM) and NOAA; it is responsible for most Alaska OCS research funded by BLM.

Department of Defense (DOD)

The Department of Defense conducts marine mammal research through the Headquarters Space Division of the Air Force, the Corps of Engineers of the Army, and through the Navy. Units of the Navy conducting this research include the Naval Ocean Systems Center (formerly Naval Undersea Center) and the Office of Naval Research. DOD research varies from basic environmental impact research to applied military research. Differentiating marine mammals from military targets, furthering the understanding of the undersea environment, and the utilization of marine mammals with specific behavioral traits for applied research are the major thrusts of the Navy program; studies on behavior modification, husbandry, bioacoustics, migration and distribution, and sensory perception are supported. Navy research also includes studies of the bacterial, viral, fungal and parasitic diseases of marine mammals with particular emphasis on those diseases that can be transmitted.

Department of Energy (DOE)

The Department of Energy (formerly the Atomic Energy Commission of the Energy Research and Development Administration) has occasionally supported marine mammal research. The thrust of the research has been directed at the behavioral ecology of sea otters, especially at Amchitka Island in the area of the CANNIKAN Shot, and also on problems associated with censusing marine mammals.

Department of Health and Human Services (DHHS)

The Department of Health and Human Services, formerly the Department of Health, Education and Welfare--(HEW), through the National Institutes of Health, funds some research related to marine mammals; the research is basically oriented toward an understanding of human health and physiology. It consists primarily of research on physiological mechanisms and adaptations. Marine mammals are often one of several vertebrates used in the research projects.

Department of the Interior (DOI)

The Department of the Interior, through the Bureau of Land Management, supports environmental assessment studies involving the effects of outer continental shelf development on marine mammals and their habitats. Special studies such as the effects of hydrocarbons and other disturbances from oil and gas activities are also supported. The Fish and Wildlife Service (FWS) supports management related research on the biology and population ecology of walrus, sea otter, polar bear, and sirenians (manatees and dugong). Additional studies are conducted on tissue contaminant levels in marine mammals, marine mammal tagging, and population assessment of the Hawaiian monk seal in the Hawaiian Islands National Wildlife Refuge. The Geological Survey conducts research in marine mammal paleontology and the National Park Service supports some marine mammal studies relative to national park and monument development.

Department of State (DOS)

The Department of State has supported studies of the Antarctic krill resource (a major food resource of Southern Ocean marine mammals) in consideration of the prospect of international commercial exploitation or krill in waters adjacent to Antarctica. Funds have also been provided to further cetacean research of the Inter-American Tropical Tuna Commission and the International Whaling Commission.

Department of Transportation (DOT)

The Department of Transportation, through the Coast Guard, has supported research to identify potential applied uses of the perception and capabilities of animals, including marine mammals.

### Environmental Protection Agency (EPA)

The Environmental Protection Agency has indirectly supported marine mammal research through the study and monitoring of pollutant levels in coastal and pelagic marine organisms.

### Marine Mammal Commission (MMC)

The Marine Mammal Commission supports research and studies pertaining to the conservation and protection of marine mammals to improve the operation of the Marine Mammal Protection Act. Policy studies; methodological research; information overviews; issue-specific research on population assessment, critical habitats, taking, man-induced hazards, ecological inter-relationships, and socio-economic/legal aspects of marine mammal conservation; and reviews of agency actions and research under the Act are integrated into the directed research program of the Commission.

### National Aeronautics and Space Administration (NASA)

The National Aeronautics and Space Administration develops and provides technological support for marine mammal research and studies of user agencies. Telemetric and remote sensing capabilities through aircraft and satellite support are provided.

### National Science Foundation (NSF)

Through its various divisions, the National Science Foundation supports marine mammal research; however, there is no directed effort on marine mammals per se. The studies of Antarctic marine mammals have been supported through this agency in accordance with the Antarctic Treaty.

### Smithsonian Institution (SI)

The Smithsonian Institution, through the Department of Vertebrate Zoology and the Department of Paleobiology of the Museum of Natural History, supports their staff on marine mammal research in evolution and general biology. The Scientific Event Alert Network gathers information on beached and stranded marine mammals.

### Veterans Administration (VA)

The Veterans Administration has supported a few projects on the physiological characteristics of marine mammals. Among these has been an electroencephalographic study of sleep in the pilot whale.

TABLE 1

NUMBER OF MARINE MAMMAL RESEARCH PROJECTS  
SUPPORTED BY FEDERAL AGENCIES AS REPORTED  
BY SMITHSONIAN SCIENCE INFORMATION EXCHANGE\*

	Fiscal Year										
	70	71	72	73	74	75	76	77	78	79	80
Department of Agriculture	-	2	1	-	3	3	1	-	1	-	-
Department of Commerce	-	2	6	4	12	8	14	3	15	-	-
Department of Defense	8	13	16	17	5	18	10	1	12	10	15
Department of Energy (formerly AEC and ERDA)	1	-	-	1	1	1	-	-	1	-	1
Department of Health and Human Services (formerly HEW)	6	9	7	8	5	16	15	7	2	3	4
Department of the Interior	2	1	1	9	-	1	1	7	3	-	3
Department of State	-	-	-	-	-	-	-	-	-	-	-
Department of Transportation	-	-	-	-	-	-	-	-	-	-	-
Environmental Protection Agency	-	-	-	1	-	1	1	-	-	-	-
Marine Mammal Commission	-	-	-	-	-	-	22	18	12	6	-
National Aeronautics and Space Administration	-	-	-	1	1	-	1	1	-	-	1
National Science Foundation	9	8	17	5	8	13	13	6	12	9	8
Smithsonian Institution	-	-	1	2	-	2	2	2	-	-	-
Veterans Administration	2	1	2	2	-	1	2	-	2	-	-
TOTAL	28	36	51	50	35	64	82	46	60	28	32

\*Not an all inclusive listing of federally-funded marine mammal research

TABLE 2

NUMBER OF MARINE MAMMAL RESEARCH PROJECTS SUPPORTED BY  
FEDERAL AGENCIES IN FY74-80, COMPARING SMITHSONIAN SCIENCE  
INFORMATION EXCHANGE DATA (A) TO INFORMATION PROVIDED DIRECTLY  
TO THE MARINE MAMMAL COMMISSION BY EACH AGENCY (B)

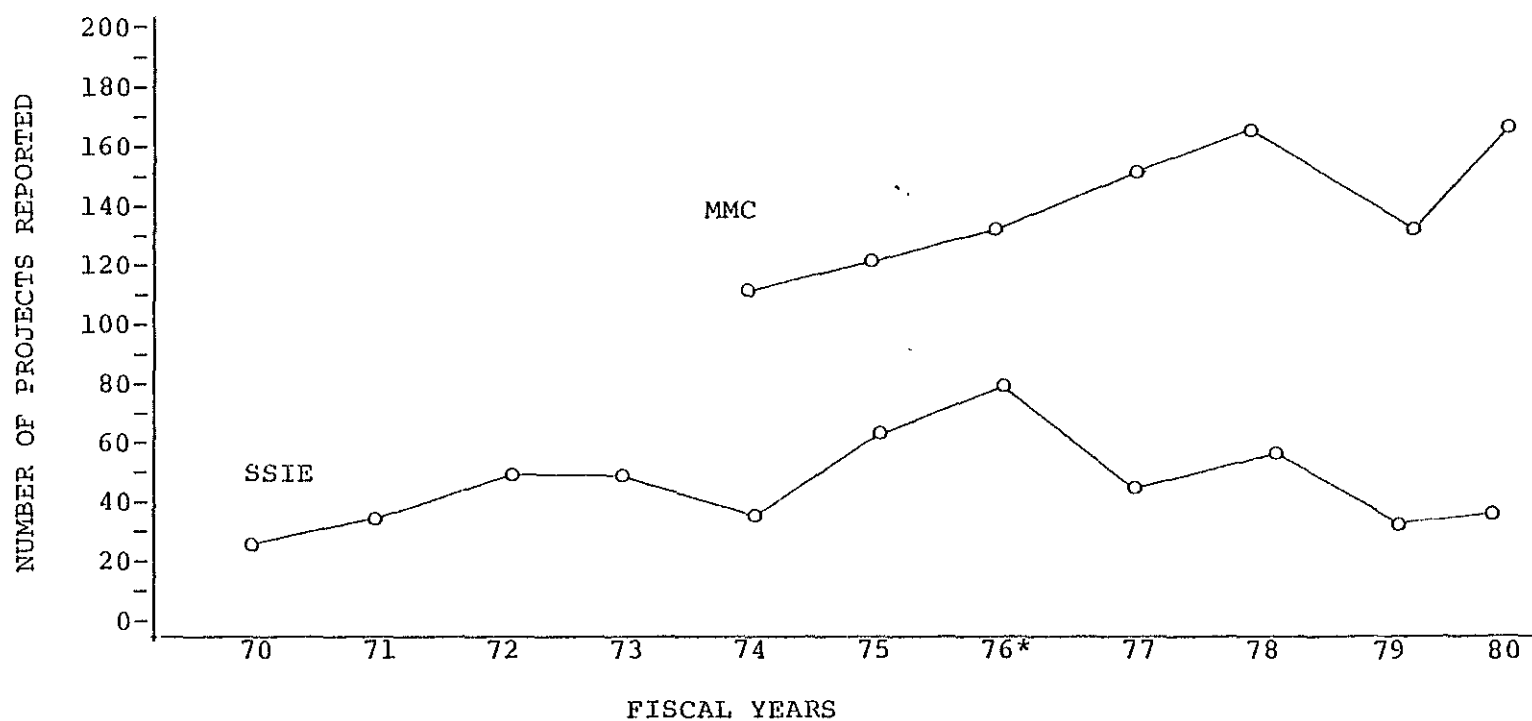
	FY74		FY75		FY76		FY77		FY78		FY79		FY80	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B
Department of Agriculture	3	2	3	1	1	-	-	-	1	-	-	2	-	1
Department of Commerce														
National Marine Fisheries Service	9	13	7	8	10	9	-	13	15	14	-	14	-	34
Sea Grant	3	4	1	2	4	1	3	1	-	2	-	2	-	2
NOAA/OCSEAP (see below)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
North Pacific Fishery Management Council	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Department of Defense														
Air Force	-	-	-	-	-	-	-	-	-	-	-	1	-	1
Army	-	-	-	-	-	-	-	-	-	-	-	1	-	2
Naval Ocean Systems Ctr. (NMC)	2	16	8	8	3	7	-	14	2	17	2	8	3	12
Naval Research Laboratory	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Office of Naval Research	3	10	10	6	7	6	1	7	10	7	8	11	12	8
Department of Energy	1	-	1	1	-	1	-	2	1	2	-	-	1	1
Department of Health and Human Services	5	20	16	26	15	17	7	13	2	12	3	8	4	9
Department of Interior														
Bureau of Land Mgmt.	-	-	-	1	-	4	-	3	-	4	-	7	2	12
BLM/NOAA/OCSEAP	-	-	-	3	-	16	-	11	-	11	-	6	-	7
Fish & Wildlife Service	-	15	-	20	-	27	5	40	2	43	-	52	1	44
Geological Survey	-	-	1	-	1	-	-	1	1	1	-	1	-	1
National Park Service	-	1	-	1	-	2	2	3	-	5	-	2	-	2
Department of State	-	-	-	-	-	-	-	-	-	2	-	1	-	1
Department of Transportation	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Environmental Protection Agency	-	1	1	1	1	-	-	-	-	-	-	-	-	-
Marine Mammal Commission	-	14	-	32	22	30	18	29	12	34	6	7	-	21
National Aeronautics & Space Administration	1	1	-	1	1	1	1	2	-	2	-	-	1	-
National Science Foundation	8	12	13	7	13	10	6	10	12	8	9	11	8	12
Smithsonian Institution	-	4	2	4	2	2	3	2	-	2	-	2	-	2
Veterans Administration	-	-	1	-	2	-	-	2	2	2	-	-	-	-
TOTAL	35		64		82		46		60		28		32	
SSIE Data														
MMC Data	113		122		133		153		168		137		174	

FIGURE 1

TRENDS OF FEDERAL SUPPORT OF MARINE MAMMAL RESEARCH

Total Number of Marine Mammal Projects as Reported:

By the Smithsonian Science Information Exchange (SSIE) and  
To the Marine Mammal Commission (MMC) by Each Agency.



\*Includes Transitional Quarter (July-September 1976)

TABLE 3

FEDERAL FUNDING OF MARINE MAMMAL RESEARCH  
(Thousands of Dollars)

	<u>FY74</u>	<u>FY75</u>	<u>FY/TQ76</u>	<u>FY77</u>	<u>FY78</u>	<u>FY79</u>	<u>FY80</u>
Department of Agriculture	37.2	9.3	---	---	---	209	---
Department of Commerce							
National Marine Fisheries Service	1218.7	1386.6	1456.4	2313.8	3603.2	4425.9	5156.7
National Sea Grant Programs	77.2	82.3	19.8	25.8	49.7	68	59.7
North Pacific Fishery Mgmt. Council	---	---	---	---	---	---	97.2
Department of Defense							
Air Force	---	---	---	---	---	40	15
Army	---	---	---	---	---	44	122
Naval Ocean Systems Ctr.	658	425	361	718	545	717	2133
Naval Research Laboratory	---	---	---	---	---	20	---
Office of Naval Research	485.4	270	260.1	414	430	538.4	462.8
Department of Energy	---	18.3	28	80	80	---	30
Department of Health and Human Services	916.9	1573.5	1078.5	781	772	392.8	602.5
Department of Interior							
Bureau of Land Management	---	706.7	2046.4	2242	2519.8	7457.3	6006.3
Fish & Wildlife Service	706	734.2	933	933	1042.7	1452.5	1418.9
Geological Survey	---	---	---	31.2	30.5	20	30
National Park Service	6	6	17.2	16.5	64.8	45.8	66
Department of State	---	---	---	---	51	500	592.9
Department of Transportation	---	---	---	---	---	---	95
Environmental Protection Agency	47	49.8	---	---	---	---	---
Marine Mammal Commission	258.8	446.7	561.7	420.3	376.1	152.6	358.7
National Aeronautics & Space Administration	45	100	194	50	65	---	12



TABLE 3 (continued)  
 Federal Funding of Marine Mammal Research

	<u>FY74</u>	<u>FY75</u>	<u>FY/TQ76</u>	<u>FY77</u>	<u>FY78</u>	<u>FY79</u>	<u>FY80</u>
National Science Foundation	515.6	292.8	690.4	718.9	334.2	479.3	677.6
Smithsonian Institution	68.5	80.1	102	106.1	101.1	133.4	142.8
Veterans Administration	---	---	---	102.6	98.9	---	---
<hr/>							
TOTAL	\$5013.3K	\$6181.3K	\$7748.5K	\$8953.2K	\$10,164K	\$16,696K	\$18,079.1

TABLE 4

REGIONALLY ORIENTED MARINE MAMMAL RESEARCH  
IN WATERS ADJACENT TO THE UNITED STATES

(Thousands of Dollars; Number of Projects in Parentheses)

Geographical Region	FISCAL YEAR						
	74	75	76*	77	78	79	80
Hawaii	---	5 ( 1)	51.5 ( 2)	102.6 ( 8)	118.2 ( 6)	71.4 ( 2)	411.1 (11)
Alaska	780.4 (22)	1,670.5 (31)	2,451.5 (36)	2,861.7 (39)	3,336.8 (46)	3,746.7 (17)	5,407.4 (34)
Oregon/ Washington	17 ( 1)	87.3 ( 6)	81.6 ( 6)	43.5 ( 2)	60.3 ( 4)	68 ( 2)	229.9 ( 2)
California	102.5 ( 4)	805.4 ( 9)	1,370 (18)	1,132 (11)	317.2 (12)	1,675.2 (11)	3,234.9 (19)
Gulf of Mexico	7.9 ( 1)	---	6 ( 1)	---	2.4 ( 2)	144.3 ( 1)	200 ( 1)
Florida	121.3 ( 4)	187.5 ( 6)	139.9 ( 9)	171.2 (10)	269 (12)	656.3 ( 4)	858.2 (21)
Georgia, South Carolina and North Carolina	---	---	---	199.9 ( 1)	---	---	200 ( 2)
NE Coastal States	31.9 ( 3)	43.3 ( 3)	56.2 ( 5)	29.3 ( 3)	1,484 ( 4)	2,762.9 ( 1)	292.7 (14)

\*Includes Transition Quarter (July-September 1976)

TABLE 5

TAXONOMIC SUMMARY OF  
FEDERALLY-FUNDED MARINE MAMMAL RESEARCH  
(Thousands of Dollars)

	Agr.	Comm.	Def.	DOE	DHHS	DOI*	DOS	DOT	EPA	MMC	NASA	NSF	SI	VA	TOTAL
Sirenia	74					60									60
(Manatees	75					119.2									119.2
and Dugong)	76					173.8									173.8
	77					190.2					50				240.2
	78					267.1					15				282.9
	79		44			580.5				0.8					624.5
	80		122			328.7				109					559.7
Carnivora	74					90									90
(Polar Bear	75			18.3	27.3	375				15.3					435.9
and Sea	76			28		629.3				103.2					760.5
Otter)	77			30		587.3				40.6					657.9
	78			30		717.7				49.9					797.6
	79	59.7				809.4						22.6			891.7
	80	71		30		718						36.3			855.3
Pinnipedia	74	37.2	586.8	90		56.3				56.2		268	49.5		1150
(Seals, Sea	75	9.3	752.7	140		210.7				154.9		156.6	51.8		1647
Lions and	76		760.5	147		116.2				54.3		268.3	59.2		2090.1
Walrus)	77		783.8	274		141.3				64.8		131.1	56.1	102.6	2317.2
	78		858.7	325						33.7		141.5	45		2068.5
	79	200	956.7	246		76.6				59.1		243.2	47.4		2418
	80		1454.7	353		43.5				106		240.7			2665.6
Cetacea	74		695.5	344		294.2				77.9		170.1	19		1600.7
(Whales and	75		675	250.5		365.1				190.9		61	28.3		1570.8
Porpoises)	76		709.7	263.1		114.3				262.8		275.2	42.8		1794.1
	77		1555.8	527		144.6				124.9		213.1			2818.8
	78		2794.2	446		149.6				169.7		163.1			4000.6
	79		3326.3	746.4		74.1	2937.5	500		81		187.9			7853.2
	80		3542.8	1737.8		167.1	2060.9	592.9		133.7		380.8			8616.0
Mixed Species	74		13.6	682.4		566.4			47	124.7	45	77.5			2112.6
or General	75		41.2	304.5		970.4			49.8	85.6	100	75.2			2408.4
Studies	76		6	211		848				141.4		146.9			2736
	77			331	50	495.1				190		374.7	50		2919.1
	78			204	50	622.4				122	50	29.6	56.1	98.9	3014.4
	79	9	210.9	323		242.1				12.5		25.6	86		4908.6
	80		245.1	520		391.9				10		19.8	142.8		5370.5

\*Budget information not available on all individual projects

TABLE 6

FEDERAL FUNDING OF MARINE MAMMAL  
RESEARCH BY RESEARCH ISSUE  
(Thousands of Dollars)

SPECIAL RESEARCH ISSUE	FISCAL YEAR							FUNDING AGENCY
	74	75	76	77	78	79	80	
Tuna/Porpoise: Population Assessment	85.1	108	81	516.5 2	524.5	462.7	676.9	NMFS MMC DOS
Mortality Reduction	167.4	140.2	120 178 119.6	299.6 97.1	487.6 67.4	500 512.9	592.9 433.1	NMFS MMC NSF Navy NMFS
Assessment of Taking	3.5	9.8	12.4	179 189.6	318.7	329.5	346.9	MMC NMFS
Biology	271.3 26	342.9	136	138.1 12.5	220.4 10	705.3	382.4 31.6	NMFS Navy MMC NSF
International Whaling Convention: Assessment of Stocks and Taking (overview studies)	32	(33.6)	(38.7) 26.3 21.5	(52.8) 33.5	(103) 19.8	70.9	340.5 65	NMFS MMC NSF
Marine Mammal/Fisheries Conflicts: Southern Ocean Krill			10	14.5	4 51	25.6		MMC DOS NSF
Fin Fish/Pinniped Interactions		17.7	19.8	25.8	49.7 59.3	68	4.9 604.6	Sea Grant MMC NMFS
Shell Fish/Sea Otter Interactions						70	6 4.5	Sea Grant FWS
Fin Fish/Porpoise Interactions							2	MMC
Effects of Oil on Marine Mammals: Physiological Studies			91.5	59 2.8	65	1097.8	394.1	BLM MMC
Marine Mammal Strandings: Biological Studies	15 (6.4)	25 (18.3)	32.3 (42.8) 6	15 (11.9) 70.4 (15)	(14.6)	3.5	(15) 20	MMC SI NMFS BLM FWS

SPECIAL RESEARCH ISSUES (Cont.)	FISCAL YEAR							FUNDING AGENCY
	74	75	76	77	78	79	80	
Bowhead Whales: Assessment of Stocks and Taking	16	(20.6)	(38.7) (44.1)	201 (42.5)	724 (167.2) 6.7	871.1	737.2 274	NMFS BLM MMC
Biology							600 590	Navy BLM
Humpback Whale: Population Assessment			(38.7)	(52.8)	(103)	15	39.1	NMFS
Biology			11.2	10	21.4 31.3 39.7	39.8 40.2 48	15 63 42.3 24	MMC NPS NSF Navy
Gray Whale: Population Assessment	31.4	(32.7)	(38.8)	(52.8)	(103)	25.7	37	NMFS Navy
Assessment of Human- Induced Impact		14.7	16.5	9.8	20.6			MMC
Biology							364.8	BLM
Killer Whale: Population Assessment	17	(17.6) 37.9	(38.8)	(52.7)	7.9 (15.3)	3		NMFS MMC NSF
Pilot Whales: Population Assessment	10				(15.3)			Navy NSF SI
Biology	(6.3)	(5)						
Belukha: Population Assessment:			(44)	(42.5)	(17.2)			BLM
Biology			20	10	25		350	Navy
Harbor Porpoise Population Assessment:							45	NMFS
Dall Porpoise: Population Assessment					210	6.9	264	NMFS
Bottlenose Dolphin: Population Assessment	55	68.3			1.9	180.8	219.9	MMC NMFS
Biology	211 38.1 54.3	100 55.6	133 20 15.8	270 86.7 31.8	168 92.8 0.5	467 85.3	903.9 90.1	Navy HEW NSF MMC NMFS
						9		

SPECIAL RESEARCH ISSUES (Cont.)	FISCAL YEAR							FUNDING AGENCY
	74	75	76	77	78	79	80	
Northern Fur Seal: Population Assessment and Monitoring	395.2	339.5	354.4	352	(367)	430.2	246	NMFS
Biology	145.5	330.9 32.2	330.2	366 70	384 96	269.3 88	410.9	NMFS MMC Navy
Guadalupe Fur Seal: Population Studies			(13.3)	(13.3)	(16.7)			NMFS
Antarctic Seals: Population Studies	125.8	115.5			50.3	97		NSF
Biology	64.3	15.2	241.1	172.7	89	70.4	171.7	NSF
Arctic Seals: Population Studies	18.3 9.7	(20.6)						NMFS Sea Grant
Biology	7	55	78 136	157 201.1	85 237.6	212	38.8	BLM MMC Sea Grant BLM NSF
Hawaiian Monk Seal: Population Assessment		55	38.2 (13.3)	52.3 (13.3)	52 (16.7)	31.2 3	60.9 50.9 138.3	MMC FWS NMFS
Biology				34.1	25.8		34.9	MMC
Gray Seal: Population Studies	(5.2)			10.2			2.3	MMC NMFS
Biology		90	110	10	30			Navy
Harbor Seal: Population Studies	(5.3) 6	27 6	33.5 6 3	17.7 6	5.2 31	6 11.5	53.7 39.4	Sea Grant MMC NPS NMFS
Biology		2.3	8.6 65	2.8 60	(50)	50	25	MMC BLM Navy
Northern Elephant Seal: Population Studies			(13.3)	(13.3)	(16.7)	4.1		NMFS
Biology	27.9	25.9	27.2	33.1	31.8	41.2 10	30.2 5.3 43.5	NSF MMC DHHS
California Sea Lion: Population Studies			7			82.5		NMFS
Biology	37.2	9.3				200		USDA

SPECIAL RESEARCH ISSUES (Contd.)	FISCAL YEAR							FUNDING AGENCY
	74	75	76	77	78	79	80	
California Sea Lion: Biology (cont.)	40 29.3 50	35 64.7 2	37 12.2	74	110		247	Navy HEW NSF MMC
Steller Sea Lion: Population Studies			157.1	145.5	155	148	95	BLM
Walrus: Population Studies		(160)	112.8	141.6	52 5	141.8	231.8	FWS MMC Sea Grant MMC
Biology	17.6 38.7	27.3 48.4				20		
Manatees & Dugong: Population Studies	(60)	100	(143.8)	159.7 50	(236.6) 0.5 0.8	(290.3)	(265.7) 3 109	FWS NASA NPS MMC BLM
Biology		19.2	(30)	(30)	(30)	144.3* (127.2) 44	45 122	FWS Army
Polar Bear: Population Studies	(45)	214.3	(401)	(303.1)	(223.1)	251	(140.8)	FWS
Biology		35.7	(50)	(50) (150)	(50)	22.6	(50) 36.3	FWS NSF
Sea Otter: Population Studies	(45)	(125)	157.2 21.1	151.9	352.1	(530.4)	(400)	FWS BLM
Biology	13.5	27.3 15.3 18.3	103.2 28	40.6 30 23.3 59	49.9 30 27.5	(28)	30 (189.8)	HEW MMC DOE FWS BLM

Amounts indicated in parentheses are estimated subunits of totals reported by agencies under more general categories.

\*Pilot study: Only 5-10% was for study of manatees.

## II. RESEARCH AND STUDIES UNDER AUTHORITY OF THE MARINE MAMMAL PROTECTION ACT OF 1972

The Marine Mammal Protection Act of 1972 (MMPA) established the Marine Mammal Commission and distributed marine mammal protection and conservation responsibilities to the Secretary of Commerce and the Secretary of the Interior, including the agencies under their purview. The Act acknowledged the need for further information and encouraged research; some responsibilities for research and its implementation were designated in Sections 108, 109, 111, 112, 202, and 205. Table 7 is a list of annual funding authorized under the various sections of the Act, the amounts requested by agencies pursuant to the Act, and amounts appropriated by Congress. Additional federal funds have been spent in activities related to marine mammals; the additional sources and amounts of research funding are shown in Table 8 and Figure 2. The number of personnel assigned to marine mammal research versus administrative responsibilities within the National Marine Fisheries Service and the Fish and Wildlife Service from FY73 through FY80 are listed in Table 9.



RESEARCH RESPONSIBILITIES OF FEDERAL  
AGENCIES UNDER THE MARINE MAMMAL PROTECTION ACT

Congress, in developing the Marine Mammal Protection Act, recognized that there was inadequate knowledge of the ecology and population dynamics of marine mammals as well as of other factors important for marine mammal protection and conservation. The Act, therefore, specified certain research and study responsibilities for the Department of Commerce, Department of Interior, and the Marine Mammal Commission.

The Secretary of Commerce was directed to undertake, in consultation with the Marine Mammal Commission, a study of the North Pacific fur seals to determine whether herds of such seals, subject to the jurisdiction of the United States, are presently at their optimum sustainable population and what population trends are evident. The Secretary was also to undertake a comprehensive study in consultation with the Secretary of State, to determine what modifications, if any, should be made to the provisions of the North Pacific Fur Seal Convention, or of the Marine Mammal Protection Act, or both, to make the Convention and the Act consistent with each other. These studies were to be completed by 21 October 1973 [Sec. 108(b)(1)].

The Secretary of Commerce was also directed to immediately undertake a program of research and development for the purpose of devising improved fishing methods and gear so as to reduce to the maximum extent practicable the incidental taking of marine mammals in connection with commercial fishing. For purposes of this research, Congress authorized the sum of \$1,000,000 to be appropriated for both FY 73 and FY 74. Funds appropriated for this research remain available until expended [Sec. 111(a)].

Both the Secretary of Commerce and the Secretary of Interior are authorized by the Act to make grants to each state whose laws and regulations relating to protection and management of marine mammals which primarily inhabit waters or lands within the boundaries of that state are found to be consistent with the purposes and policies of the Act. The purpose of such grants shall be to assist such states in developing and implementing state programs for the protection and management of such marine mammals. Such grants are not to exceed 50 per centum of the costs of a particular program's development and implementation [Sec. 109(b)].

The Secretaries are also authorized to make, after review by the Marine Mammal Commission, grants to any federal or state agency,

public or private institution, or other person to enable research on topics relevant to the protection and conservation of marine mammals. Authorized to be appropriated for these grants in FY73 and for each of the next four fiscal years was an amount not to exceed \$2,500,000--one-third of the sum to be available to the Secretary of Interior and two-thirds of the Secretary of Commerce [Sec. 110 (a) (b) (c)].

The Secretaries, as appropriate, are directed to review annually the operation of each program in which the United States participates involving the taking of marine mammals on land [Sec. 112 (d)]. The secretaries are required by the Act to report annually to the public and to the Congress on the current status of all marine mammal species and population stocks subject to the provision of the Act [Sec. 103 (f)].

The Marine Mammal Commission established under Section 201 of the Act was directed in Section 202(a) to:

1. Undertake a review and study of the activities of the United States pursuant to existing laws and international conventions relating to marine mammals, including, but not limited to, the International Convention for the Regulation of Whaling, the Whaling Convention Act of 1949, the Interim Convention on the Conservation of North Pacific Fur Seals, and the Fur Seal Act of 1966;
2. Conduct a continuing review of the condition of the stocks of marine mammals, of methods for their protection and conservation, of humane means of taking marine mammals, of research programs conducted under authority of the Act, and of all applications for permits; and
3. Undertake or cause to be undertaken such other studies as it deems necessary or desirable in connection with its assigned duties as to the protection and conservation of marine mammals.

The Act gave the Commission access to all studies and data compiled by federal agencies regarding marine mammals. With the consent of the appropriate Secretary or agency head, the Commission may also utilize the facilities or services of any federal agency and shall take every feasible step to avoid duplication of research and to carry out the purposes of the Act [Sec. 205].

TABLE 7  
 FEDERAL FUNDING UNDER THE  
 MARINE MAMMAL PROTECTION ACT  
 (Thousands of Dollars)

	AUTHORIZED <sup>a</sup>					REQUESTED <sup>b</sup>					APPROPRIATED <sup>c</sup>				
	Sec 109	Sec 110	Sec 114	Sec 207	Total	Sec 109	Sec 110	Sec 114	Sec 207	Total	Sec 109	Sec 110	Sec 114	Sec 207	Total
Department of Commerce (NMFS)															
FY73	1000*	1667	2000	-	4667	375*	-	1090	-	1465	-	-	-	-	-
FY74	1000*	1667	2000	-	4667	900*	-	4400	-	5300	-	250	1350	-	1600
FY75	-	1667	2000	-	3667	-	250	2300	-	2550	-	250	1350	-	1600
FY76	-	1667	2000	-	3667	-	250	2300	-	2550	-	1100	1697	-	2797
FY77	-	1667	3000	-	4667	-	1667	3272	-	4939	-	1667	2778	-	4445
FY78	-	200	11500	-	11700	-	-	4872	-	4872	-	-	4872	-	4872
FY79	225	2700	8500	-	11425	-	200	6842	-	7042	-	200	6842	-	7042
FY80	225	2700	9000	-	11925	-	100	6628	-	6728	-	100	7128	-	7228
FY81	225	2700	9500	-	12425	-	100	7775	-	7875	-	100	6980	-	7080
Department of Interior (FWS)															
FY73	-	833	700	-	1553	-	100	700	-	800	-	0	0	-	0
FY74	-	833	525	-	1358	-	400	300	-	700	-	400	300	-	700
FY75	-	833	525	-	1358	-	833	525	-	1358	-	833	525	-	1358
FY76	-	833	525	-	1358	-	833	525	-	1358	-	833	525	-	1358
FY77	-	833	525	-	1358	-	833	525	-	1358	-	833	525	-	1358
FY78	-	1200	850	-	2050	-	833	525	-	1358	-	950	589	-	1539
FY79	400	1300	650	-	2350	-	1000	600	-	1600	400	1000	600	-	2000
FY80	400	1500	760	-	2660	400	1000	600	-	2000	400	1000	600	-	2000
FY81	400	2100	876	-	3376	400	1000	600	-	2000	400	1000	600	-	2000
Marine Mammal Commission															
FY73	-	-	-	1000	1000	-	-	-	0	0	-	-	-	0	0
FY74	-	-	-	1000	1000	-	-	-	825	825	-	-	-	412	412
FY75	-	-	-	1000	1000	-	-	-	1000	1000	-	-	-	750	750
FY76	-	-	-	1000	1000	-	-	-	1000	1000	-	-	-	900	900
FY77	-	-	-	1000	1000	-	-	-	1000	1000	-	-	-	1000	1000
FY78	-	-	-	1000	1000	-	-	-	900	900	-	-	-	900	900
FY79	-	-	-	1000	1000	-	-	-	702	702	-	-	-	702	702
FY80	-	-	-	1000	1000	-	-	-	640	640	-	-	-	940	940
FY81	-	-	-	1000	1000	-	-	-	-	-	-	-	-	-	-

\*Section 111 funds

<sup>a</sup>Authorized under sections of the Act

<sup>b</sup>Requested funding of the agencies

<sup>c</sup>Funds subsequently appropriated by Congress

TABLE 8

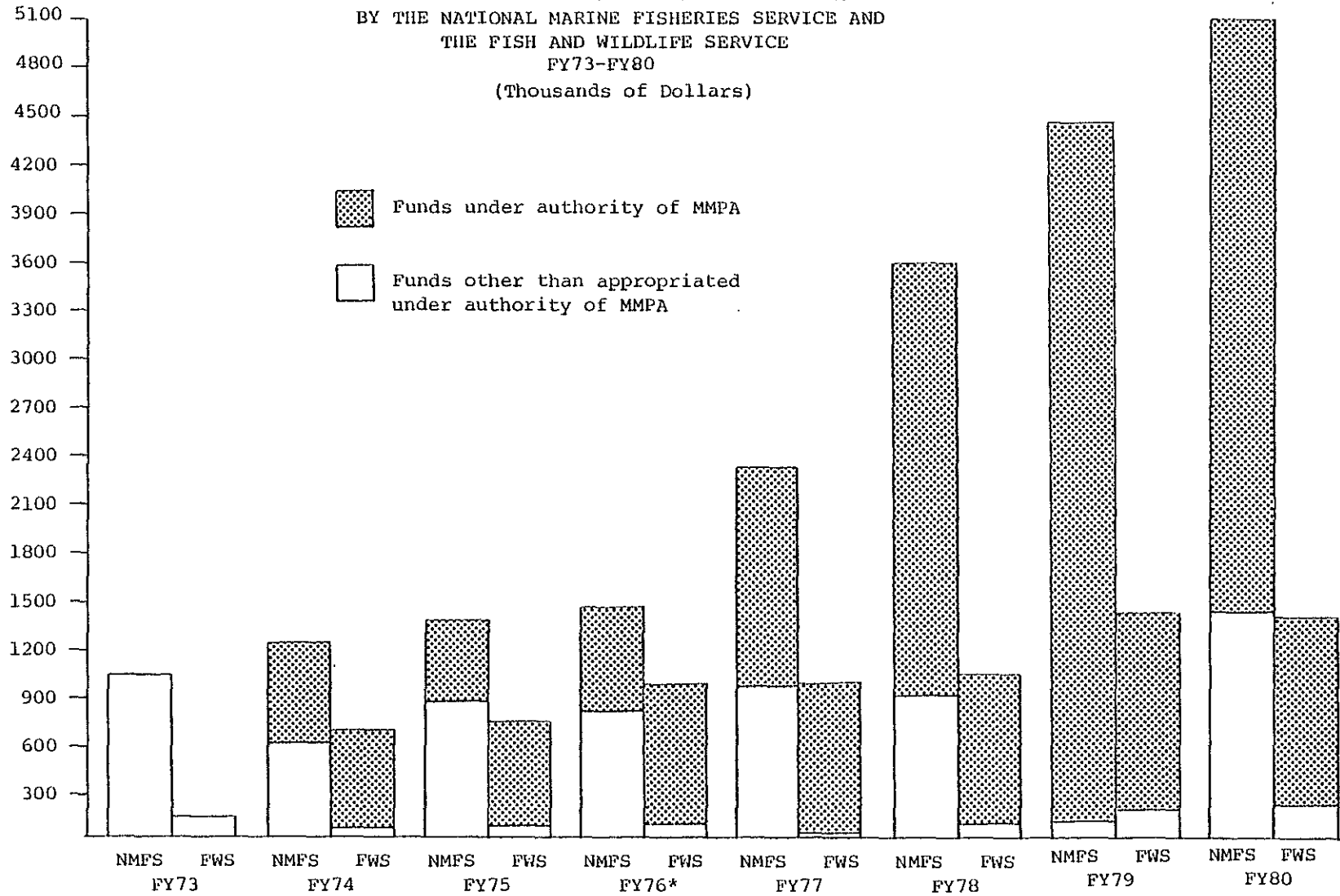
FUNDS EXPENDED ON MARINE MAMMAL RESEARCH  
OTHER THAN THOSE APPROPRIATED UNDER AUTHORITY OF THE  
MARINE MAMMAL PROTECTION ACT  
(Thousands of Dollars)

<u>NOAA/National Marine Fisheries Service</u>	<u>Source</u>	<u>Amount</u>
FY73	NMFS Reprogramming	300
	NOAA Reserve	424
	Fur Seal Act Authorization	309
FY74	Fur Seal Act Authorization	309
	Reprogramming and Reserve	295
FY75	Fur Seal Act Authorization	395
	NOAA Reserve	442
FY76	Fur Seal Act Authorization	595
	NMFS Reprogramming	59
TQ76	Fur Seal Act Authorization	148
FY77	Fur Seal Act Authorization	595
	Endangered Species Act Authorization	294
	Saltonstall-Kennedy Reserve	78
FY78	Fur Seal Act Authorization	595
	Endangered Species Act Authorization	294
FY79	Endangered Species Act Authorization	132
	Fur Seal Act Authorization	595
FY80	Endangered Species Act Authorization	1428.4
	Fur Seal Act Authorization	595
<u>DOI/Fish and Wildlife Service</u>		
FY73	FWS Appropriation	149
FY74	FWS Appropriation	49
FY75	FWS Appropriation	75
FY76	FWS Appropriation	67.2
TQ76	FWS Appropriation	16.1
FY77	FWS Appropriation	16
FY78	Endangered Species Act Authorization	93.7

TABLE 8 (Contd.)

<u>NOAA/National Marine Fisheries Service</u>	<u>Source</u>	<u>Amount</u>
FY79	Endangered Species Act Authorization	213.1
FY80	Endangered Species Act Authorization	162
	FWS Appropriation	82.2

FIGURE 2  
 FUNDS EXPENDED ON MARINE MAMMAL RESEARCH  
 BY THE NATIONAL MARINE FISHERIES SERVICE AND  
 THE FISH AND WILDLIFE SERVICE  
 FY73-FY80  
 (Thousands of Dollars)



\*FY76 data include transition quarter (July-September 1976)

TABLE 9

NUMBER OF PERSONNEL ASSIGNED TO MARINE MAMMAL  
ADMINISTRATIVE AND RESEARCH ACTIVITIES IN  
THE NATIONAL MARINE FISHERIES SERVICE AND  
FISH AND WILDLIFE SERVICE, FY73 - FY80\*

<u>National Marine Fisheries Service Personnel**</u>	<u>73</u>	<u>74</u>	<u>75</u>	<u>76</u>	<u>TQ76</u>	<u>77</u>	<u>78</u>	<u>79</u>	<u>80</u>
Administrative (includes enforcement)	11	28	28	42	49	7	8	86.5	
Research	23	26	33	31	29	17	20	48.9	
NMFS Total	34	54	61	73	78	24	28	135.4	166.1
<u>Fish and Wildlife Service Personnel***</u>									
Administrative	?	12.1	14.1	15.2	****	16.6	17.1	20.3	24.6
Research	2.6	6.0	11.0	11.8	****	14.8	13.2	17.2	17.4
FWS Total	2.6+	18.1	25.1	27.0	****	31.4	30.3	37.5	42.0

\* Figures provided by the Agencies

\*\* The National Marine Fisheries Service changed their method of reporting at least twice--once in FY77 (to number of personnel) and again in FY79 (to permanent employee man-years).

\*\*\* Reported in man-years

\*\*\*\* Man-years maintained at 24% of the FY76 level.

## III. APPENDIX A

PUBLICATIONS IDENTIFIED BY AGENCIES AS  
SOURCES OR PENDING SOURCES OF  
MARINE MAMMAL INFORMATION FROM FUNDED RESEARCHDepartment of Commerce

## --National Marine Fisheries Service

Administrative reports of the various fisheries centers  
 Marine Mammal Division - Annual Report on Fur Seal  
 Investigations  
 Fishery Bulletin (NMFS, NOAA, Department of Commerce)  
 Marine Fisheries Review (NMFS, NOAA, Department of  
 Commerce)  
 Journal of Mammalogy  
 International Whaling Commission Annual Reports  
 Journal Fisheries Research Board of Canada (Canadian  
 Journal of Fisheries and Aquatic Sciences)  
 Proceedings of the Second Conference on the  
 Biology of Marine Mammals  
 NOAA Technical Reports/NMFS Scientific Reports-Fisheries  
 Other journals as appropriate

## --National Sea Grant College Program

Marine Mammal Information

## --NOAA/OCSEAP reports (see Bureau of Land Management below)

Department of Defense

## --Department of the Air Force

Headquarters Space Division Technical Report  
 Space Shuttle Final Environmental Impact  
 Statement

## --Department of the Navy

Naval Ocean Systems Center Technical Reports  
 Marine Fisheries Review  
 Annals of New York Academy of Science  
 Fishery Bulletin  
 Vision Research  
 Cetology  
 Deep-Sea Research  
 Journal Acoustical Society of America  
 American Journal of Veterinary Research  
 Science  
 Arctic



--Department of the Navy (Cont.)

Journal of Wildlife Diseases  
Microbios Letters  
Journal American Veterinary Medical Association  
Transactions of the San Diego Society of Natural  
History  
Journal of Mammalogy  
Contributions of edited books

Department of Energy

Progress reports on projects  
Canadian Journal of Fisheries and Aquatic Sciences  
Ecological Monographs  
Wildlife Society Bulletin  
Environmental Conservation  
Journal American Veterinary Medical Association

Department of the Interior

--Bureau of Land Management

NOAA/OCSEAP Annual Reports  
NOAA/OCSEAP Final Reports  
NOAA/OCSEAP Lease Area Synthesis Reports  
Other reports available through National Technical  
Information Service

--Fish and Wildlife Service

North America Fauna Series  
U.S. Department of the Interior,  
Fish and Wildlife Service  
Wildlife Research Reports  
U.S. Fish and Wildlife Service,  
National Fish and Wildlife  
Laboratory Reports

--Geological Survey

Systematic Zoology  
Smithsonian Institution Contributions to  
Paleobiology  
Geological Survey Professional Papers  
Publications of the Charleston Museum

--National Park Service

Project reports to National Park Service

Department of State

Project reports available through National  
Technical Information Service  
EIS: Possible Regime for Conservation of Antarctic  
Marine Living Resources  
IWC Scientific Reports

Marine Mammal Commission

Reports available through the National  
Technical Information Service

Smithsonian Institution

Fishery Bulletin  
Journal of Mammalogy  
Proceedings of the Biological Society of Washington  
Systematic Zoology  
Smithsonian Institution Contributions to Paleobiology  
Florida State Museum, Plaster Jacket  
Contributions to edited books

IV. APPENDIX B  
LISTING OF MARINE MAMMAL RESEARCH PROJECTS,  
PRINCIPAL INVESTIGATORS, AND FUNDING LEVEL  
FOR FY80\*

COMPILED FROM INFORMATION PROVIDED  
THE MARINE MAMMAL COMMISSION  
BY EACH AGENCY  
AND SUPPLEMENTED  
WITH INFORMATION FROM THE  
SMITHSONIAN SCIENCE INFORMATION EXCHANGE (SSIE)

\*For a listing of projects for the period FY70-FY79 see  
Waring, G. H., 1981, Survey of federally-funded marine mammal  
research and studies, FY70-FY79. U.S. Dept. Commerce, National  
Technical Information Service PB81-174336. 235p.

Department of Agriculture

Gelberg, H. (Plum Island Animal Disease Center)

Comparative Swine and Pinniped Pathology of Swine Vesicular Exanthema and San Miguel Sea Lion Viruses	\$ ?
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Department of Commerce

## 1. National Marine Fisheries Service

## A. Northeast Fisheries Center

Austin, H.M. (Virginia Institute of Marine Sci.) Distribution and Abundance of Bottlenose Dolphins in the Nearshore Waters of Virginia (NA80FA-D8)	\$ 9.9K
Gilbert, J.R. (U. Maine) Impact of Harbor Seal Populations on New England Fisheries (NA80FA-C29)	\$36.7K
Katona, S.K. (College of the Atlantic) Creating and Maintaining a Catalog of Individually Identified Humpback Whales (NA80FA-D6)	\$23.4K
Mayo, C.A. III (Provincetown Center of Coastal Studies) Summary of Recent Observations from Whale-Watching Boats off Provincetown, Massachusetts (NA80FA-D3)	\$ 4.9K
Powers, K.D. (Manomet Bird Observatory) Development and Supervision of an Oceanic Marine Mammal Observer Training Program (NA80FA-D4)	\$24.7K
Powers, K.D. (Manomet Bird Observatory) Habitat Usage by Harbor Seals at Winter Haul-Out Site in Cape Cod Bay (NA80FA-D5)	\$ 9.4K
Prescott, J.H. (New England Aquarium) Characterization of Habitat and Distribu- tion; an Estimate of Population Size; and an Assessment of the Impact of Human Ac- tivities on the Harbor Porpoise (NA80FA-D9)	\$45 K

Prescott, J.H. (New England Aquarium) An Assessment of the Distribution and Relative Abundance of Large Cetaceans in the Western Approaches to the Bay of Fundy (NA80FA-C48)	\$20.7K
Prescott, J.H. (New England Aquarium) Organize and Convene a Workshop on Humpback Whales of the Western North Atlantic in Fall 1980 (NA80FA-C55)	\$15.7K
Prescott, J.H. (New England Aquarium) Investigation of Harbor Seal Mortality and Determination of the Infectious Agent in the New England Region (NA80FA-H9)	\$30 K
Schurman, V.R. (Cape Cod Museum of Natural History) A Report on the Grey Seal Population at Nantucket, Massachusetts (NA80FB-A229)	\$ 2.3K
Sears, R. (Mingan Island Cetacean Study, Falmouth) Behavioral and Distribution of Cetaceans on the North Shore of the Gulf of St. Lawrence (NA80FB-A241)	\$ 2.5K
Stangroom, R. (Kendall Whaling Museum, Sharon) Compilation of Biological Data from 19th Century Whaling Logbooks and Journals (NA80FA-D2)	\$ 5 K
B. Northwest and Alaska Fisheries Center, National Marine Mammal Laboratory	
Braham, H. (NMML) Arctic Whales--Bowhead (NWC-59)	\$737.2K
DeLong, R. and R. Everitt (NMML & Wash. Dept. of Game) Washington-Oregon Marine Mammal/Fisheries Interactions (NWC-53)	\$176.2K
Fiscus, C. and R. DeLong (NMML) Pinnipeds (NWC-53)	\$ 98.5K
Fowler, C.W. and A. Roppel (NMML) Northern Fur Seal Population (NWC-3)	\$246 K
Gentry, R. (NMML) Fur Seal Studies--St. George (NWC-51)	\$278.4K

Jones, L. (NMML) Dall's Porpoise Investigations (NWC-4)	\$264K
Kajimura, H. (NMML) Marine Mammal Ecosystem --Pelagic (NWC-57)	\$132.5K
Keyes, M.C. (NMML) Veterinary Medical Services (NWC-56)	\$ 61.8K
McAlister, W.B. (NMML) Marine Mammal-Fishery Interactions --Bering Sea (NWC-8)	\$155.5K
Rice, D. et al. (NMML) Endangered Cetaceans (NWC-58)	\$340.5K
C. Southeast Fisheries Center	
Benigno, J. (SEFC) Marine Mammals Project Management (88C4L1KB)	\$ 51.8K
Benigno, J. and R. Ford (SEFC) <u>Tursiops</u> Local Herd Biodynamics (88C4L1KC)	\$105 K
Benigno, J. and R. Ford (SEFC) Marine Mammal and Sea Turtle Stranding and Salvage Network (88C4L1KG)	\$ 20 K
Benigno, J. and R. Gracy (SEFC) Tursiops Population Analysis	\$105 K
D. Southwest Fisheries Center	
Gilmartin, W. (SWFC) Hawaiian Monk Seal	\$138.3K
Perrin, W., D. Au, and J. Henderson (SWFC) Assessment of Coastal Marine Mammals for Management	\$111.5K
(California Fish and Game) Assessment of Conflicts Between Marine Mammals and Fisheries in California Waters (\$74K) *[Additional \$65K funded by Southwest Region of NMFS]	\$(65K) *
Perrin, W., J. Coe, and W. Stunz (SWFC) Marion Mammal Technology, Behavior and Physiology	\$433.1K
Perrin, W., A. Myrick and J. Jennings (SWFC) Marine Mammal Biological Studies	\$382.4K

Smith, T., R. Holt and D. Au (SWFC)	
Porpoise Stock Assessment	\$676.9K
Smith, T., C. Oliver and N. Lo (SWFC)	
Quantitative Analysis and Data Management	346.9K
2. NOAA/OCSEAP (See Department of Interior--BLM)	
3. National Sea Grant College Program	
Cicin-Sain, B. (U. California, San Diego)	
Marine Mammals/Fisheries Conflicts: Emphasis on Sea Otter/Shellfish Conflicts in California	\$ 6 K
Mate, B. R. (Oregon State U.)	
Population Growth and Feeding Habits of Harbor Seals in an Aquacultural-Enhanced Environment	\$ 53.7K
4. North Pacific Fishery Management Council	
Fay, F. H. and L. F. Lowry (U. Alaska and Alaska Department of Fish and Game)	
Seasonal Use and Feeding Habits of Walruses in the Proposed Bristol Bay Clam Fishery Area	\$ 97.2K

Department of Defense

1. Air Force (Headquarters Space Division)	
Jehl, J. R. and R. Schreiber (Hubbs-Sea World Research Institute)	
Effects of Loud Impulse Noises in Causing Startle Behavior and/or Panic Responses in Pinnipeds	\$ 15 K
2. Army (Corps of Engineers)	
Bengston, J. (U. Minnesota)	
St. John's River Manatee Project Study	\$ 44 K
Haller, W. T. (U. Florida)	
Herbicide Residues in Crystal River	\$ 78 K
3. Navy	
A. Naval Ocean Systems Center	
Bowers, C. A. (NOSC)	
Marine Mammal Capabilities ( <u>Delphinapterus</u> ) (MM01510C)	\$350 K

Carder, D.A. and W.W. Au (NOSC) Signal Processing in the Dolphin Brain Stem (DN087531)	SSIE	\$	?
Gilmartin, W.G. (NOSC) Captive Dolphin Breeding ( <u>Tursiops</u> ) (MM02510B)		\$	95 K
Gilmartin, W.G. and S.H. Ridgway (NOSC) Marine Mammal Medical Research and Animal Health		\$	405 K
Hui, C.A. (NOSC) Dolphin Bioenergetics ( <u>Delphinus</u> ) (MM02510H)		\$	79 K
Ljungblad, D.K. (NOSC) Bowhead Whale Acoustics (MM25510A)		\$	154 K
Nachtigall, P.E. (NOSC) Dolphin Behavioral and Biosonar Research ( <u>Tursiops</u> ) (MM01510K)		\$	600 K
Nachtigall, P.E. (NOSC) <u>Tursiops</u> Directional Hearing (MM02510D)		\$	60 K
Ridgway, S.H. (NOSC) Neurophysiological Research ( <u>Tursiops</u> ) (ZS39510A)		\$	143 K
Schusterman, R.V. (California State U., Hayward) Pinniped Behavioral Evaluation ( <u>Zalophus</u> ) (MM02510E)		\$	27 K
Scronce, B. (NOSC) Sea Lion Training Evaluation: Wild Caught vs. Captive Born ( <u>Zalophus</u> ) (MM01510T)		\$	220 K
Turl, C.W. and L.W. Bivens (NOSC) Sea Lion Survey (DN087540)	SSIE	\$	?
B. Office of Naval Research			
Altes, R. (Crincon Corp.) Computer and Mathematical Analysis of Dolphin Whistles)	SSIE	\$	5.9K
Cummings, W.D. (U. California., San Diego) Distribution and Identification of Low Frequency Biological Noises in the Ocean	SSIE	\$	35 K



Evans, W.E. (Hubbs Sea World Research Inst.) Research on Small Pacific Ocean Cetaceans (NR083-102-31)	\$ 10 K
Gilmartin, W.G. (NOSC) Martin Mammal Bionosis (NR-204-008)	\$ 30 K
Malins, D.C. and U. Varanasi (Seattle U.) The Biochemistry of Lipids Peculiar to Organs and Tissue of Cetaceans and Involved in Sound Transmission	SSIE \$ 18.9K
Mate, B. (Oregon State U.) The Distribution of Cetaceans (Gray Whale) (NR-083-102-31)	\$ 37 K
Schusterman, R. (California State U., Hayward) Marine Mammal Acoustics (California sea lion and northern fur seal) (NR-104-131)	\$ 66 K
Vedros, N.A. (Naval Biosciences Lab.) Marine Mammal Diseases and Immunity (NR-204-001)	\$ 85 K
Wartzok, D. and G.C. Ray (Johns Hopkins U.) Marine Mammal Behavior, Acoustics and Ecology (spotted seal and harbor seal) (NR-104-676)	\$ 25 K
Watkins, W.A. and W.E. Schevill (Woods Hole Oceanographic Inst.) Marine Biological Sounds (NR083-004-39)	\$126 K
Winn, H.E. (U. Rhode Island) Bioacoustics and Behavior of Marine Mammals (Humpback Whale) (NR-083-165-4)	\$ 24 K

Department of Energy

Tester, J.R. and D.B. Siniff (U. Minnesota) Vertebrate Behavior and Ecology (sea otter) (DE-AC0Z-76EV01332)	\$ 30 K
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Department of Health and Human Services

National Institutes of Health

Atassi, M.Z. (Mayo Foundation) Immunochemical Studies on Hemoglobin and Myo- globin (whales)	\$ 89.1K
Bryan, W.P. (Indiana U. School of Medicine) The Role of Water in Protein Structure and Function (whales, human)	\$ 47.4K

Elsner, R.W. (U. Alaska) Comparative Pathophysiology of Myocardial Ischemia (dog, seals)	\$ 85.2K
Gurd, F.R. (Indiana U.) Structure and Reactivity of Proteins and Lipoproteins (human, cetaceans, etc.)	\$147.3K
Gurd, F.R. (Indiana U.) Specific Enrichment of Myoglobins for Carbon 13 NMR (cetaceans)	\$ 78 K
Hawkridge, F.M. (Virginia Commonwealth U.) Electron Transfer at Surface Electrodes (horse, whales)	\$ 38.3K
Howard, E.B. (U. Southern California) Toxicologic, Immunologic Effect of Environ- mental Contamination (marine mammals)	\$ 17.1K
Kooyman, G.L. (U. California, San Diego) Physiological Basis of Pulmonary Disease: Comparative Physiology (vertebrates)	\$ 56.6K
Ortiz, C.L. (U. California, Santa Cruz) Northern Elephant Seal in Its Natural Habitat	\$ 43.5K

Department of the Interior

1. Bureau of Land Management

Albert, T. (U. Maryland) Tissue Analysis of Endangered Whales in the Beaufort Sea (AA851-CTO-22)	\$350 K
Braithwaite, L. (Brigham Young U.) The Effect of Oil on the Feeding Mechanism of the Bowhead Whale (AA851-CTO-55)	\$ 44.1K
Dohl, T.P. (U. California, Santa Cruz) Marine Mammal and Seabird Study of Central and Northern California	\$2,442.8K
Fraker, M. and J. Richardson (LGL Ecological Research Associates) Possible Effects of Acoustic and Other Stimuli Associated with Oil and Gas Ex- ploration/Development on the Behavior of the Bowhead Whale (AA851-CTO-44)	\$ 590K

Fritts, T.H. (U.S. Fish and Wildlife Service) Gulf of Mexico and South Atlantic Endangered Species Study, Year 1 (AA851-MUO-21)	\$494.9K
Geraci, J.R. and D.J. St. Aubin (U. Guelph) Study of the Effects of Oil on Marine Mammals (AA851-CT9-29)	\$ 0
Hobbs, L. (Marine Mammal Tagging Office) Development of Large Cetacean Tagging and Tracking Capability in OCS Lease Areas (AA851-IAO-32)	\$244.5K
Linder, E., B. Gayles, S. Johnson, P. Thompson (Naval Ocean Systems Center) Study of the Effects of Sound on Marine Mammals (AA851-IAO-5)	\$512.7K
Ljungbald, D. (Naval Ocean Systems Center) Aerial Surveys of Bowhead Whales, North Slope of Alaska (AA851-IAO-1)	\$274 K
Mate, B. (Oregon State U.) Monitoring the Movements of Whales in and Adjacent to OCS Lease Areas (AA551-CT9-34)	\$202.8K
Watkins, W. (Woods Hole Oceanographic Inst.) Effects of Whale Monitoring System Attach- ment Devices on Whale Tissues (AA851-CTO-23)	\$ 74.5K
Winn, R., R. Edel and M. Hyman (U. Rhode Island) Characterization of Marine Mammals and Turtles in the North and Mid-Atlantic Areas of the U.S. Outer Continental Shelf (AA551- CT8-48)	\$ 0

2. BLM/NOAA/OCSEAP

Calkins, D. and K. Pitcher (Alaska Dept. Fish & Game) Population Assessment, Ecology and Trophic Relationships of Steller Sea Lions in the Gulf of Alaska (RU243)	\$ 95K
Fay, F. (U. Alaska) Morbidity and Mortality of Key Marine Mammal Species (RU194)	\$ 82K
Jones, L. and H. Braham (National Marine Mammal Lab.) Collection and Analysis of NMFS Marine Mammal Platforms of Opportunity Data (RU68)	\$ 47K

Lowry, L., J. Burns and K. Frost (Alaska Dept. Fish & Game) Trophic Relationships, Habitat Use, Winter Ecology Among Ice-Inhabiting Phocid Seals and Functionally Related Marine Mammals in the Arctic (RU232)	\$ 90K
Nerini, M. and H. Braham (National Marine Mammal Lab.) Feeding Ecology of the Gray Whale in the Norton Basin (RU593)	\$150K
Rice, D. and W. Wolman (National Marine Mammal Lab.) Habitat Use by Humpback, Gray and Fin Whales in the Gulf of Alaska (RU592)	\$300K
Taber, A. and H. Braham (National Marine Mammal Lab.) Habitat Utilization by the Gray Whale of Nelson Lagoon, Alaska (RU605)	\$ 12K
3. Fish and Wildlife Service	
--Polar Bear:	\$190.8K
DeMaster, D. (National Fish and Wildlife Lab.) Satellite Tracking of Bears (904.02.01)	
Biological Parameters of Bears of Western Beaufort Sea (904.02.02)	
Feasibility of Ecosystem-Oriented Studies of Bears in Beaufort Sea (904.02.03)	
Biology and Ecology of Bears of Arctic Ocean (904.02.04)	
Summer Distribution and Ecology of Bears (904.02.05)	
DeMaster, D. (NFWL) and D. Siniff (U. Minnesota) Produce Model to Simulate Population Dynamics of the Northern Alaska Polar Bear Population (904.02.06)	
Staff (NFWL) Annual Status Report (904.02.07)	
Siniff, D.B. (U. Minnesota) Development and Field and Lab Testing of Radio Telemetry Packages and Systems for Polar Bears (as well as Sea Otters, Walruses, and Manatees) (\$67K)	

## --Sea Otters

\$594.2K

Jameson, R.J. (NFWL)  
 Biology and Management Needs for Sea Otters  
 in California (904.03.01)

Estes, J.A. and G.R. Vanblaricom (NFWL)  
 Interaction Between Sea Otters and the  
 Nearshore Community (904.03.02)

Johnson, A.M. (NFWL)  
 Annual and Seasonal Distribution, Abund-  
 ance and Composition of Populations of  
 Sea Otters and Other Marine Mammals in  
 Prince William Sound, Alaska (904.03.04)

Brownell, R.L. (NFWL)  
 Parasites and Environmental Containments  
 in Sea Otters (904.03.07)

Staff (NFWL)  
 Annual Status Report (904.02.08)

Doyle, W. (U. California, Santa Cruz)  
 Kelp canopy interactions in Monterey  
 Bay (\$31K)

Economics of Pismo Clam Fishery (\$4.5K)

San Nicolas Island (California) Survey for  
 Baseline Data and as Potential Sea Otter  
 Translocation Site (\$133.2K)

Hardy, R.A. (California Dept. Fish & Game)  
 Sea Otter Mortality Rates and Causes  
 (E-M-2)

Interrelationship Between Sea Otters and  
 Their Habitat (E-M-2)

Size, Distribution and Movements of  
 California's Sea Otter Population

Feasibility of Translocating Sea Otters

## --Walruses

\$231.8K

DeMaster, D. (NFWL)  
 Biological Activity of Pacific and  
 Atlantic Walruses (904.03.06)

Brownell, R. (NFWL)  
Parasites and Environmental Contaminants in  
Walrus (904.03.07)

Staff (NFWL)  
Annual Status Reports on Pacific and Atlantic  
Walrus (904.03.08)

Doyle, W. (U. California, Santa Cruz)  
Round Island Walrus Survey (\$17.7K)

Alaska Regional Office, FWS  
Aerial Walrus Survey

--Hawaiian Monk Seal \$ 50.9K

Johnson, A.M. (NFWL)  
Biological Studies to Determine Status of  
Population (904.03.05)

--Manatees \$319.3K

Rathbun, G.B. (NFWL)  
Distribution and Status of all Manatee Taxa  
and Populations (904.01.01)

Basic Reproductive and Behavioral Character-  
istics of West Indian Manatees (904.01.02)

Define Ecosystem Relationships of the Manatee,  
and Assess Effects of Habitat Alterations  
(904.01.03)

Determine Causes of Manatee Mortality, and  
Study and Salvage Stranded Manatees and  
Other Marine Mammals (904.01.04)

Influence of Warm Water Effluents on Manatee  
Distribution and Movements Around Selected  
Powerplants (904.01.05)

Basic Sensory and Physiological Parameters  
of West Indian Manatees as Related to  
Technical Needs (904.01.06)

Develop Manatee Tagging and Tracking Technology  
(904.01.07)

Brownell, R.L. (NFWL)  
Parasites and Environmental Contaminants in  
Manatees (904.01.08)

Staff (NFWL)  
Annual Status Reports (904.01.09)

Forrester, D. (U. Florida)  
Study of Parasites and Diseases  
of the West Indian Manatee (\$5K)

Doyle, W. (U. California, Santa Cruz)  
Evaluation of Existing Manatee-Propeller  
Guard Technology (\$1.8K)

Siniff, D.B. (U. Minnesota)  
Ecology and Behavior of the West Indian  
Manatee in the St. Johns River, Florida  
(\$40K)

--Dugong \$ 6.4K

Brownell, R.L. (NFWL)  
Distribution and Status of All Dugong  
Populations (904.01.01)

Parasites and Environmental Contaminants  
in Dugongs (904.01.08)

Staff (NFWL)  
Annual Status Report (904.01.09)

--Marine Mammal Tagging \$ 25.5K

Hobbs, L. (NFWL)  
Serve as Clearinghouse and Information  
Center for Marine Mammal Tagging Operations  
(904.04.01)

Stimulate Research and Development of  
Marine Mammal Tags and Techniques (904.04.02)

Archive Data From Tagging/Marking Studies  
(904.04.03)

4. Geological Survey

Whitmore, F.C. (USGS)  
Vertebrate Biostratigraphy and Paleogeog-  
raphy, Atlantic and Gulf Coastal Plain \$ 30.0K

5. National Park Service

Dean, F. (U. Alaska), C. & V. Jurasz (Sea Search)  
Glacier Bay Humpback Whale Data Analysis  
(CK9000-0-0004) \$ 63.0K

Everglades National Park, NPS  
Manatee Survey

\$ 3.0K

Department of State

Bureau of Oceans and International Environment and  
Scientific Affairs

Joseph, J. (Inter-American Tropical Tuna Commission)  
Porpoise-Tuna Investigations

\$592.9K

Department of Transportation

Coast Guard, Office of Research and Development

Naval Ocean Systems Center  
Final Report on the Coast Guard Program in Bio-  
logical Phenomena

\$ 95.0K

Environmental Protection Agency

(No projects reported)

Marine Mammal Commission

Ainley, C. and H. Huber (Point Reyes Bird Observatory)  
Analysis of Tagged Elephant Seal Data Collected  
on the Farallon Islands, California (MM1801125-6)

\$ 5.3K

Cedar Creek Laboratory (U. Minnesota)  
Provide Radio Transmitters for Hawaiian Monk  
Seal Dive Profile (MM1800944-6)

\$ 2.8K

Clark, W., (U. Washington)  
Continuation of Population Analysis and Research on  
Stocks of Great Whales (MM1801114-6)

\$ 42.0K

Fish and Wildlife Service  
Manatee Recovery Activities Coordinator  
(MM1800908-6)

\$ 50.0K

Pilot Program--Development of Site-Specific  
Research/Management Plans for Areas of Special  
Significance to the West Indian Manatee (MM1801024-4)

\$ 25.0K

Initiation of a Study to Assess and Characterize  
Food Preference and Feeding Areas of Manatees in  
the Crystal River of Florida (MM1801025-7)

\$ 18.0K



Johnson, B. & P. Johnson Evaluation of Hawaiian Monk Seal Survey and Molt Data Collected and Laysan Island in 1977-1979 (MM1533701-4)	\$ 6.9K
Kasuya, T. (Ocean Research Institute) The Fishery-Dolphin Conflict in the Iki Island Area of Japan (MM1533791-7)	\$ 2.0K
Mayo, C. (Provincetown Center for Coastal Studies) Field Observations of Cetacea of the Provincetown, Massachusetts Area: 1975-1979 (MM1800925-5)	\$ 9.7K
National Academy of Science Evaluation of Marine Ecosystem Research in the Antarctic (MM1800913-2)	\$ 10.0K
National Marine Fisheries Service Continuation and Expansion of Monk Seal Population Studies (MM1800911-6)	\$ 50.0K
Workshop to Develop a Monk Seal Die-Off Response Plan (MM1800967-9)	\$ 4.0K
Assessment and Monitoring of Endangered Whales, Harbor Porpoise, and Other Centaceans Along the Northeast Coast of the United States (MM1801023-1)	\$ 65.0K
Workshop on Humpback Whales of the Western North Atlantic (MM1801038-3)	\$ 15.0K
Analyses of Data Concerning the Biology, Ecology, Behavior and Population Dynamics of Monk Seals in Laysan Island (MM1801102-3)	\$ 21.0K
Nolan, R. (Ocean Research Consulting and Analysis, Ltd.) Review of Available Information Concerning the Possible Effects of a Shark Control Program on Shark Populations and Other Components of Marine Communities of the Vicinity of Kure Atoll or Else- where in the Northwest Hawaiian Islands (MM1801065-5)	\$ 4.2K
Seaco (Kailua, Hawaii) Identification and Evaluation of On-Going and Planned Fisheries in the Northwest Hawaiian Islands (MM1801069-7)	\$ 6.9K
State of Florida Department of Natural Resources Workshop for the Education of Florida Law En- forcement Officers Relating to Manatees (MM1800941-7)	\$ 6.8K
Manatee Advisory Group (MM1800942-0)	\$ 4.2K
Manatee Education and Information Program (MM1801124-3)	\$ 5.0K

Swartzman, G. (U. Washington)  
 Exploring Interactions Between Fur Seal Populations  
 and Fisheries in the Bering Sea (MM1800969-5) \$ 4.9K

National Aeronautics and Space Administration

Ray, G.C., D. Wartzok (Johns Hopkins U.) and P. Sebesta  
 (Ames Research Center)  
 Study of Predictive Ecological Models Useful for  
 the Management and Conservation of Bering Sea  
 Mammals SSIE \$ 12K

National Science Foundation

Awbrey, F.T. (San Diego State U.)  
 Artificial Aggregating System for Tuna Purse  
 Seining SSIE \$ 0

Dawson, W.W. (U. Florida)  
 Physiology of Vision in Dolphins and Other  
 Cetaceans (79-14129) \$ 99.2K

Fay, F.H. (U. Alaska)  
 Energy Cost and Control of Molting in Bering Sea  
 Harbor and Spotted Seals (80-06957) \$ 38.8K

Hall, E.R. (U. Kansas)  
 A Systematic Classification of North American  
Ursus (80-14252) \$ 36.3K

Herman, L.M. (U. Hawaii, Manoa)  
 Behaviors and Social Organization of Humpback  
 Whales in Hawaiian Waters (77-24943) \$ 42.3K

Dolphin Information-Processing Capabilities  
 (77-16882) \$ 43.5K

Jehl, J.R. and W.E. Evans (Hubbs-Sea World Institute)  
 Distribution and Ecology of Orcinus and Globicephala  
 in the Antarctic (80-22633) \$ 33.8K

Kooyman, G. L. (Scripps Inst. Oceanography)  
 Biology of Weddell Seals During the Austral Summer  
 (79-23623) \$ 95.3K

LeBoeuf, B.J. (U. California, Santa Cruz)  
 Biological Studies of the Northern Elephant Seal  
 (77-17063) \$ 30.2K

Morgane, P.J. (Worcester Foundation for Experimental Biology, Inc.) Archicortical-Limbic Formations of Dolphin Brain (77-8660)	\$ 46.6K
Norris, K.S. (U. California, Santa Cruz) Behavior of the Hawaiian Spinner Dolphin (78-24683)	\$ 83.8K
Siniff, D.B. (U. Minnesota) The Role of the Leopard Seal in the Antarctic Marine Ecosystem (80-17257)	\$ 76.4K
The Development of Satellite Tracking and Antarctic Position/Activity Monitoring for Selected Antarctic Vertebrates (80-17348)	\$ 19.8K
Wormuth, J. (Texas A & M University) A Study of Feeding Relationships in Tuna and Por- poise Through the Application of Cephalopod Beak Analysis (79-24779)	SSIE \$ 31.6K

Smithsonian Institution

Mead, J. (National Museum of Natural History) Marine Mammal Program	\$ 93.5K
Ray, C. (National Museum of Natural History) Fossil Marine Mammals	\$ 49.3K

Veterans Administration

(No projects reported)