Marine Mammal Taxon Advisory Group
Regional Collection Plan

2009-2012

Prepared by the Marine Mammal Taxon Advisory Group

First Edition

Photo by Brenna Hernandez

Chair: **Jim Robinett**, Shedd Aquarium
jrobinett@sheddaquarium.org

Vice-chair: **Gayle Sirpenski**, Mystic Aquarium & Institute for Exploration
gsirpenski@mysticaquarium.org

Secretary: **Mark Ryan**, Sunset Zoo
ryan@ci.manhattan.ks.us

PMC Population Management Center
Lincoln Park Zoo

ASSOCIATION OF ZOOS & AQUARIUMS

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Marine Mammal TAG
Regional Collection Plan

The Marine Mammal Taxon Advisory Group advocates and supports the captive care and management of the whales, dolphins, seals, sea lions, manatees, walrus, and sea otters in AZA institutions and the conservation of the wild populations they represent.

INTRODUCTION

Regional Collection Plans (RCPs) are the means by which Taxon Advisory Groups (TAGs) provide valuable information to zoo and aquarium managers. RCPs are intended to be guides in the development of Institutional Collection Plans that promote long term captive populations through responsible animal management. The TAG recognizes that a plan such as this is a living document. The information contained within this RCP will be reviewed and published every three years. Information in this document includes the status of wild marine mammal populations, an account of current and future space for marine mammals in AZA zoos and aquariums, and recommendations for the captive management of selected species. The Regional Collection Plan for Marine Mammals includes contact information for program managers as well as information on the structure of the TAG. The draft RCP was distributed to all Marine Mammal TAG Institutional Representatives on November 1, 2008 for the required thirty-day review and comment period.

Management of the marine mammals housed in zoos and aquariums in the United States falls under the jurisdiction of three federal agencies that regulate and enforce three primary laws pertaining to their conservation and management. The TAG strongly recommends that managers of marine mammals become familiar with these regulations (see Appendix II for additional information). Marine mammals housed in zoos and aquariums outside the U.S. are subject to regulations established by the individual countries. International transfer of marine mammals requires knowledge of and compliance with the regulations of all jurisdictions involved.

TAXONOMY and DEFINITION OF TAXA UNDER MARINE MAMMAL TAG PURVIEW

The Marine Mammal TAG covers marine mammals in the Orders Carnivora, Cetacea and Sirenia. Polar bears are considered marine mammals by the United States Department of Agriculture for purposes of regulatory oversight, but in AZA are under the purview of the Bear TAG and so are not included in the Marine Mammal TAG Regional Collection Plan. The taxonomy of *Mammal Species of the World*. 3rd ed., 2005 Wilson, D. E. and D. M. Reeder, eds. is followed for the identification and designation of marine mammal species. Reviewers for the marine mammal section of this reference include James Mead and Robert Brownell, Jr. There are 14 families of Cetacea covering over 80 species of whales and dolphins, the majority of which are not currently held in North American collections. In the Order Carnivora, 13 of the approximately 35 species are currently maintained in our collections and in the Order Sirenia, only one of the four living species is held.

TAG GOALS

The primary goal of the Marine Mammal TAG is the effective management of marine mammal species in AZA zoos and aquariums, including the development of programs for those species designated for long term management. The TAG will also oversee the development of animal care manuals for marine mammals under our purview. The TAG seeks to foster working relationships with the US regulatory and permitting agencies and to act as an information resource for AZA zoos and aquariums. Marine mammal managers are encouraged to use the following listserves:

Beluga Whale Management Group	beluga@lists.aza.org
Marine Mammal IRs	marinemammalirs@lists.aza.org
Pinnipeds	pinnipeds@lists.aza.org
Walrus Management Group	walrusmg@lists.aza.org

MARINE MAMMAL TAG STEERING COMMITTEE STRUCTURE AND MEMBERSHIP

The Marine Mammal TAG is composed of a twelve-member steering committee which includes a Chair, Vice-Chair and Secretary. The current TAG Chair was appointed by WCMC in December 2006, the Vice Chair and Secretary were elected from the Steering Committee by the Steering Committee. Steering Committee members are elected for three year terms with no term limits. All Marine Mammal TAG IRs are eligible to be nominated for a position on the Steering Committee. The TAG Secretary will solicit nominations and conduct elections. Marine mammal program managers and advisors serve as non-voting contributors to the TAG.

All AZA institutions may appoint one Institutional Representative (IR) to the Marine Mammal TAG. The primary responsibility of IRs is to communicate with the Steering Committee and disseminate information from the TAG to their respective institutions. Steering Committee members are responsible for taking part in decision-making in TAG operation, assisting with the development of the Regional Collection Plan, oversight of program management, leadership of standing and *ad hoc* committees, and other administrative duties as needed. Steering Committee members are required to have access to electronic communication, and are encouraged to attend at least one meeting of the TAG each year.

Chair: **Jim Robinett**, John G. Shedd Aquarium
jrobinett@sheddaquarium.org (312) 692-3235

Vice-chair: **Gayle Sirpenski**, Mystic Aquarium & Institute for Exploration
gsirpenski@mysticaquarium.org (860) 572-5955 x108

Secretary: **Mark Ryan**, Sunset Zoo
ryan@ci.manhattan.ks.us 785-587-2737

Steering Committee:

Jodie Baker Indianapolis Zoo - *jbaker@indyzoo.com* (317) 630-5167
Traci Belting Seattle Aquarium - *Traci.Belting@seattle.gov* (206)-310-7663
Scott Carter Detroit Zoo - *scarter@detroitzoo.org* (248) 398-0903 x3160
Suzanne Gendron Ocean Park Hong Kong - *suzanne.gendron@oceanpark.com.hk* (852) 28738890
Suzanne Merner Santa Ana Zoo - *smerner@santa-ana.org* (714) 647-6542
Linda Moore Smithsonian National Zoological Park - *moore@si.edu* 202-633-3210
John Rupp Point Defiance Zoo and Aquarium – *John.Rupp@pdza.org* (253) 404- 3675
Rita Stacey Chicago Zoological Society - *rita.stacey@czs.org* (708) 688-8442
Clint Wright Vancouver Aquarium – *clint.wright@vanaqua.org* (604) 659-3583

Advisors:
CJ Casson Sea otter population manager, Seattle Aquarium - *cj.casson@seattle.gov*
Jennifer McGee California sealion population manager, Brookfield Zoo - *jemcgee@brookfieldzoo.org*
Megan Wright Harbor seal population manager, Blank Park Zoo - *mmwright@blankparkzoo.org*
Brad Andrews Killer whale population manager, Sea World – *brad.andrews@anheuser-busch.com*
Marilyn Dudley Bottlenose dolphin population manager, Sea World – *Marilyn.Dudley@SeaWorld.Com*
Derek Woodie Beluga Advisor, Point Defiance Zoo and Aquarium – *derek.woodie@pdza.org*
Virginia Edmunds Manatee population manager, Lowry Park Zoo - *virginia.edmonds@lowryparkzoo.com*
Natalie Mylniczenko Veterinary Advisor, Chicago Zoological Society - *Natalie.Mylniczenko@czs.org*
Cherie Williams Education Advisor, Seattle Aquarium - *cherie.williams@seattle.gov*
Ken Ramirez Training/Enrichment Advisor, Shedd Aquarium - k*ramirez@sheddaquarium.org*
Lisa Mazzaro Nutrition Advisor, Mystic Aquarium - *lmazzaro@mysticaquarium.org*
Randall Wells Research Advisor, Chicago Zoological Society, Mote Marine Laboratory - *rwells@mote.org*
Todd Robeck Reproductive Advisor, Sea World - *Todd.Robeck@SeaWorld.com*
Martha Wells PR Advisor, Mote Marine Aquarium – *marthawells@mote.org*
Ken Reininger WCMC Liaison

Conservation Status of Marine Mammals in AZA

CARNIVORA

	Species	Common Name	CITES	IUCN	ESA	MMPA	Est. wild Pop.	Geographic Distribution	Threats to wild Populations
Mustelidae	***Enhydra lutris kenyoni***	**Northern sea otter**	Appendix II	Endangered	Strategic stock (SW Alaska)	Not listed	AK 48,000 Canada 3200 WA 1125	Shorelines of Alaska, B.C. Canada and Washington state	Oil pollution, predation by killer whales, frequent poaching as reported from Russia and conflict with fisheries.
Mustelidae	***Enhydra lutris nereis***	**Southern sea otter**	Appendix I	Endangered	Threatened	Depleted	2700	Central California coast	
Odobenidae	***Odobenus rosmarus***	**Walrus**	Appendix III	Data deficient	Not listed	Not listed	200,000 (Pacific) 22,000 (Atlantic	Canada; Greenland; Russian Federation; Svalbard and Jan Mayen	Reduction of sea ice, hunting
Otariidae	***Arctocephalus townsendi***	**Guadalupe fur seal**	Appendix I	Near threatened	Threatened	Depleted	12-15,000	Guadalupe Island-Mexico. Channel Islands of CA	Competition with fisheries, entanglement in driftnets and floating marine debris. Oil spills, lack of genetic diversity due to small pop.
Otariidae	***Arctocephalus pusillus***	**Brown fur seal**	Appendix II	Least concern	Not listed	Not listed	S. Africa- 1.8 million, Australia 90,000	Coast of Namibia; western and southern coasts of South Africa.	Competition with fisheries, entanglement in driftnets and floating marine debris. Commercial hunting in Namibia
Otariidae	***Callorhinus ursinus***	**Northern fur seal**	Not listed	Vulnerable	Strategic stock (Eastern Pacific Stock	Depleted	Eastern Pacific stock 722,000	Pacific rim from Japan to the Channel Islands of California	Decline of Pollock and herring stocks. Competition with fisheries, entanglement in driftnets and floating marine debris
Otariidae	***Eumetopias jubatus***	**Steller sea lion**	Not listed	Endangered	Western stock is endangered; eastern stock is threatened	Depleted	40-45,000 Western stock; 44-48,000 Eastern stock	North Pacific Rim from Japan to central California	Decline of pollock and herring stocks, contaminants/pollutants, habitat degradation, illegal hunting/shooting, offshore oil and gas exploration, direct and indirect interactions with fisheries
Otariidae	***Zalophus californianus***	**California sealion**	Not listed	Least concern	Not listed	Not listed	300,000	Vancouver Island, British Columbia to the southern tip of Baja California in Mexico	Competition with fisheries, entanglement in driftnets and floating marine debris
Phocidae	***Cystophora cristata***	**Hooded seal**	Not listed	Vulnerable	Not listed	Not listed	650,000	Far north Atlantic Ocean from Svalbard in the east to the Gulf of St. Lawrence in the west; highly migratory with occasional individuals south to Caribbean	Competition with fisheries, entanglement in driftnets and floating marine debris. Reduction of pack ice

	Species	Common Name	CITES	IUCN	ESA	MMPA	Est. wild Pop.	Geographic Distribution	Threats to wild Populations
Phocidae	***Halichoerus grypus***	**Gray seal**	Not listed	Least concern	Not listed	Non-depleted non-candidate	250,000 (Canada) 25,000 in all other populations	Temperate and subarctic waters on both sides of the North Atlantic ocean	Power plant entrainments, bycatch, boat strikes, pollution, changes in natural species dynamics
Phocidae	***Mirounga angustirostris***	**Northern Elephant seal**	Deleted from list in 1992	Least concern	Not listed	Non-depleted non-candidate	170,000	North Pacific, from Baja California, Mexico to the Gulf of Alaska and Aleutian Islands	Potential interactions with commercial fisheries
Phocidae	***Mirounga leonina***	**Southern Elephant seal**	Appendix II	Least concern	Not listed	Non-depleted non-candidate	650,000	nearly circumpolar distribution in the southern Hemisphere	Few threats other than climate change
Phocidae	***Monachus schauinslandi***	**Hawaiian monk seal**	Appendix I	Critically Endangered	Endangered	Depleted	935 (2007 estimate)	Hawaiian Islands	Food limitation due to competition with fisheries, or competition with other predators; entanglement in marine debris and gillnets, predation by sharks. .
Phocidae	***Pagophilus groenlandicus***	**Harp seal**	Not listed	Least concern	Not listed	Non-depleted non-candidate	8 million	Canada; Greenland; Iceland; Svalbard	Interactions with commercial fishing operations (insignificant), hunting
Phocidae	***Phoca vitulina***	**Harbor seal**	Not listed	Least concern	Not listed	Non-depleted non-candidate	350-500,000	coastal waters of the Northern Hemisphere, from temperate to Polar Regions. Five subspecies are recognized	Incidentally captured in fishing gear; boat strikes, oil spill exposure, chemical contaminants, and power plant entrainment
Phocidae	***Pusa hispida***	**Ringed seal**	not listed	Least concern	Candidate species	Non-depleted non-candidate	Reliable pop. estimates not available but pop is thought to be approximately 3 million	Circumpolar distribution; occurring in all seas of the Arctic Ocean; in southern Bering Sea and as far south as the Seas of Okhotsk and Japan	Interactions with commercial fishing operations. Reduction of sea ice.

CETACEA

Delphinidae	***Cephalorhynchus commersonii***	**Commerson's Dolphin**	Appendix II	Data deficient	Not listed	Non-depleted non-candidate	45,000	Western South Atlantic, including Patagonia, the Strait of Magellan, Tierra del Fuego, and the Falkland Islands	Incidental capture in gillnets and other fishing gear

	Species	Common Name	CITES	IUCN	ESA	MMPA	Est. wild Pop.	Geographic Distribution	Threats to wild Population
Delphinidae	***Delphinus delphis***	**Short-beaked Common dolphin**	Appendix I	Least concern	Not listed	Non-depleted non-candidate	3 million	Temperate, tropical, subtropical waters of the Atlantic, Pacific, and Indian Ocean	Pelagic driftnet fisheries, fisheries interactions
Delphinidae	***Globicephala macrorhynchus***	**Short-finned pilot whale**	Appendix II	Data deficient	Not listed	Non-depleted non-candidate	700,000	Tropical and warm-temperate waters worldwide, extends into cold-temperate waters in the North Pacific	Incidental mortality fishery operations
Delphinidae	***Lagenorhynchus obliquidens***	**Pacific white-sided dolphin**	Appendix II	Least concern	Not listed	Non-depleted non-candidate	900,000 to 1,000,000	Northern rim of the North Pacific, from Baja California in the east to Japan and Taiwan in the west	Incidental mortality fishery operations
Delphinidae	***Orcinus orca***	**Killer whale**	Appendix II	Data deficient	Endangered (Southern residents)	Depleted (transient population, Southern residents)	50,000 world wide; northeastern Pacific has ~ 2,250-2,700 resident, transient, and offshore	Most widely distributed marine mammals; found in all parts of the ocean and in most seas from the Arctic to the Antarctic	Human activities, depletion of prey, habitat degradation, ship collisions, and oil spills
Delphinidae	***Pseudorca crassidens***	**False Killer Whale**	Appendix II	Data deficient	Not listed	Non-depleted non-candidate	Reliable pop. estimates not available but pop is thought to be approximately 70,000	Hawaii, along West Coast, and from the Mid-Atlantic coastal states south	Hunting, depletion of prey, Incidental mortality fishery operations
Delphinidae	***Stenella attenuata***	**Pantropical spotted dolphin**	Appendix II	Least concern	Not listed	Depleted (Pacific north eastern offshore stock	1.7-2 million	Pantropical; near-shore and oceanic habitats in tropical and warm temperate seas	Japanese drive fisheries; tuna purse-seine fishery
Delphinidae	***Stenella longirostris***	**Spinner dolphin**	Appendix II	Data deficient	Not listed	Depleted (Eastern Stock)	1 million	Pelagic waters of the eastern tropical Pacific; and in shelf waters off western Central America and southern Mexico.	Incidental kill of Eastern Spinner by the tuna fishery; gillnets and purse seine

	Species	Common Name	CITES	IUCN	ESA	MMPA	Est. wild Pop.	Geographic Distribution	Threats to wild Population
Delphinidae	***Tursiops aduncus***	**Indo-pacific bottlenose dolphin**	Appendix II	Data deficient	Not listed	Non-depleted non-candidate	Reliable pop. estimates not available but pop is thought to be approximately 6,000	Southern Japan to Australia; entire rim of the Indian Ocean to Cape Agulhas in southeastern Africa, including the Red Sea.	Environmental degradation, gillnet mortality; drive fishery.
Delphinidae	***Tursiops truncatus***	**Bottlenose dolphin**	Appendix II	Least concern	Not listed	Depleted (western North Atlantic coastal stock)	600,000	All tropical and temperate waters, including the littoral zone, inshore lagoons, estuaries, and bays, and the offshore	Human interaction, incidental catch in gillnets, habitat degradation
Monodontidae	***Delphinapterus leucas***	**Beluga whale**	Appendix II	Near Threatened	Cook Inlet (distinct population) Endangered	Depleted (Cook Inlet)	150,000 (Cook Inlet 300)	Canada; Greenland; Netherlands; Norway; Russian Federation; Svalbard and Jan Mayen; United States	Subsistence hunting, climate change, pollution
Phoceonidae	***Phocoena phocoena***	**Harbor porpoise**	Appendix II	Least concern	Not listed	Non-depleted non-candidate	700,000	North Atlantic from West Greenland to Cape Hatteras, NC. North Pacific from Japan (34°N) north to the Chukchi Sea; Monterey Bay, CA to the Beaufort Sea	Bycatch in gillnets and trawls; incidentally taken in herring weirs
SIRENIA									
Trichechidae	***Trichechus manatus***	**West Indian Manatee**	Appendix I	Vulnerable	Endangered	Strategic stock	3,000 or fewer	Florida coast, Georgia, South & North Carolina, and Virginia; Subtropical Western Atlantic Coastal Zone from the Bahamas to Brazil, including the Caribbean Sea and Gulf of Mexico.	Collisions with motorboats; entanglement in fishing gear; pollutants from industrial runoff, habitat degradation, and human disturbance

IUCN Red List of Threatened Species 2007. www.iucnredlist.org

NOAA Marine Mammal Stock Assessment Reports - most recent report available

USFWS www.fws.gov/endangered/factsheet

CITES www.cites.org

CURRENT AND PROJECTED SPACE ASSESSMENT

The 2007 Marine Mammal TAG space survey was developed by the Steering Committee. In early August 2007 the survey was distributed to the designated TAG Institutional Representatives (IR) via the Institutional Liaisons (IL) of AZA-accredited facilities. A reminder to the IRs was sent again later in the month. A final request for surveys was sent to the ILs in mid September. The overall response rate was 67% however, 83% (49 out of 59) of the AZA facilities that have designated IRs responded to the survey. Tables 1 and 2 provide summary information from the space survey.

*TABLE 1 – **Summary of Current and Projected Space***

SEA OTTERS and MANATEES

SPECIES *Alphabetical within group*	**Current # of animals in AZA facilities**	**Current # of AZA institutions**	**Maximum # of spaces in AZA facilities**	**# of spaces projected in 5 years in AZA facilities**
Northern sea otter *Enhydra lutris kenyoni*	22	7	17	16
Southern sea otter *Enhydra lutris nereis*	27	9	40	48
West Indian manatee *Trichechus manatus*	17	6	27	12

PINNIPEDS

SPECIES *Alphabetical within group*	**Current # of animals in AZA facilities**	**Current # of AZA institutions**	**Maximum # of spaces in AZA facilities**	**# of spaces projected in 5 years in AZA facilities**
Walrus *Odebenus rosmarus*	24	7	41	38
Guadalupe fur seal *Arctocephalus townsendi*	2	1	0	0
Northern fur seal *Callorhinus ursinus*	13	5	26	32
Brown fur seal (S. African fur seal) *Arctocephalus pusillus*	3	1	0	0
California sealion *Zalophus californianus*	309	43	377	361
Steller sea lion *Eumetopias jubatus*	22	4	27	21
Gray seal *Halichoerus grypus*	25	11	28	30
Harbor seal *Phoca vitulina*	161	33	201	187
Harp seal *Phoca groenlandica*	2	2	15	19
Hawaiian monk seal *Monachus schauinslandi*	8	1	0	0
Hooded seal *Cystophora cristata*	0	0	5	5
Ringed seal *Pusan hispida*	1	1	3	6

TABLE 2 - ***Summary of Current and Projected Space***

CETACEANS

SPECIES *Alphabetical within group*	**Current # of animals in AZA facilities**	**Current # of AZA institutions**	**Maximum # of spaces in AZA facilities**	**# of spaces projected in 5 years in AZA facilities**
Bottlenose dolphin *Tursiops truncatus*	177	10	209	179
Commerson's dolphin *Cephalorhynchus commersonii*	7	1	18	18
Short-beaked common dolphin *Delphinus delphis*	1	1	0	0
Indo-Pacific bottlenose dolphin *Tursiops aduncus*	16	1	40	30
Pacific white-sided dolphin *Lagenorhynchus obliquidens*	15	3	30	22
Pantropical spotted dolphin *Stenella attenuata*	1	1	2	1
Spinner dolphin *Stenella longirostris*	1	1	2	1
Beluga whale *Delphinapterus leucas*	34	8	60	50
False killer whale *Pseudorcas crassidens*	2	1	5	5
Killer whale *Orcinus orca*	23	4	25	21
Short-finned pilot whale *Globicephala macrorhynchus*	2	1	3	3

SPECIES SELECTION

Marine mammals are incredibly popular in zoos and aquariums since most visitors rarely have an opportunity to view these magnificent creatures in their natural environment. The MMTAG recognizes the fascination with marine mammals and will strive to maintain a diverse collection well into the future. However, significant permitting, logistical, and public relations issues with respect to the acquisition of wild marine mammals preclude a systematic assessment of all species in the development of this Regional Collection Plan. A species-by-species review of taxa currently cared for in North America, as well as those species not currently in captivity but reasonably expected to become available through the acquisition of non-releasable stranded animals, was used to assess and make decisions about the species selection for the first edition of the Marine Mammal Regional Collection Plan. All species were considered equal with regard to potential importance in public display, education, research and conservation value.

Wild marine mammals, primarily seals, sea lions and small cetaceans, occasionally strand and are deemed non-releasable by wildlife agencies. See Appendix IV for additional information. The TAG encourages and facilitates the placement of these animals in AZA institutions when possible, which results in the opportunistic addition of new individuals and species to the collection plan. Long term programs may be recommended for those species for which suitable population sizes are possible.

Some species of marine mammals are not considered suitable for long term captive management due to their large size or specialized food requirements. More importantly, husbandry expertise for most species has not been established. No new species of cetacean are recommended for inclusion in this edition of the RCP. A list of species not recommended for captive management is provided in Appendix III.

The existence of an international collection was not a factor in the selection process at this time. Once our current managed programs are established, the TAG may revisit the option of cooperating with our foreign colleagues.

Management Program Designation Criteria

The AZA matrix of program designation criteria, below, was applied to species recommended for programs.

CRITERIA	SSP	PMP	No Management (DERP)
Availability within AZA	LOW	MODERATE	EXTREMES
Availability outside AZA	LOW	MODERATE	EXTREMES
Extinction Risk without Management (in Zoos & Aquariums)	ENDANGERED/THREATENED	VULNERABLE	EXTREMES
Extinction Risk with Management (in Zoos & Aquariums)	DECREASES	DECREASES/STABLE	STABLE
Demand within AZA	HIGH	MODERATE	LOW
Institutional Commitment	HIGH	MODERATE	LOW
Ease of Breeding	LOW/MODERATE	HIGH	EXTREMES
Extinction Risk (Wild)	ENDANGERED/THREATENED	VULNERABLE	LEAST CONCERN
Acquisition Cost (Outside AZA)	HIGH	MODERATE	LOW
Program Operating Costs	HIGH	MODERATE	LOW
International Program	YES	NO	NO
Link to Conservation of Wild Population	DIRECT	INDIRECT OR NONE	NONE
North American Governmental Conservation Program	YES	NO	NO

Species Survival Plan populations (SSP)- Intense management to maintain the captive population is implemented, with conservation of the species as a consideration. A studbook is required. The program is managed by a Species Coordinator with institutional input through IRs. Breeding and transfer recommendations are communicated through a Master Plan. Compliance by participating institutions is required. Non-member participants must be approved.

Population Management Plan populations (PMP)- Species in this category are managed less intensively by a PMP manager who offers breeding and move recommendations through a Population Management Plan. Institutional input is through TAG IRs, and compliance is encouraged. Non-member participation follows AZA and institutional Acquisition/Disposition policies.

Display/Education/Research Populations (DERP) – Marine mammal species in this category are maintained with no "managed" captive breeding. Populations are sustained by occasional births, acquisition of rescued or "problem" animals from wild populations or captive facilities outside AZA. Registries of living animals may be maintained by species champions or assigned to studbook keepers.

Phase Out Populations (PO) - Species in this category are maintained with no captive breeding with the goal of elimination of the species through attrition, ultimately for replacement with a recommended species.

Phase In Populations (PI) - Species in this category are not currently in AZA institutions, but initiation of a captive program is desired. Once in captivity, program management will be assigned as appropriate.

Not Recommended (NR) - Species in this category are not currently in AZA institutions and are not recommended for inclusion in AZA institutions.

*TABLE 3 – **Management Designation Assessment*** **- SEA OTTERS and MANATEES**

CRITERIA	**Northern sea otter**	**Southern sea otter**	**West Indian manatee**				
Availability within AZA	Low	Low	Extreme				
Availability outside AZA	Low	Low	Extreme				
Extinction Risk w/out management (in zoos and aquariums)	End/threat.	End/Threat.	Extreme				
Extinction Risk with management (in zoos and aquariums)	Stable	Stable	Stable				
Demand within AZA	Moderate	Moderate	Low				
Institutional Commitment	High	High	Moderate				
Ease of Breeding	Moderate	Moderate	Unknown				
Extinction Risk (wild) IUCN designation	Endangered	Endangered	Vulnerable				
Acquisition cost (outside AZA)	High	High	High				
Program operating costs	High	High	Moderate				
International program	No	No	No				
Link to conservation of wild populations	Direct	Direct	Direct				
N. American governmental conservation program	Yes	Yes	Yes				
	SSP - 10 PMP - 3 DERP - 0	SSP - 10 PMP - 3 DERP - 0	SSP - 3 PMP - 4 DERP - 5				
MANAGEMENT DESIGNATION	**See species worksheet for explanation**	**See species worksheet for explanation**	**DERP**				

*TABLE 4 - **Management Designation Assessment** -* PINNIPEDS

CRITERIA	**Walrus**	**Guadalupe fur seal**	**Northern fur seal**	**Brown fur seal**	**California sealion**	**Steller sea lion**	**Elephant ** seal**
Availability within AZA	Low	Extreme	Low	Extreme	Mod./ High	Low	Extreme
Availability outside AZA	Low	Extreme	Low	Moderate	Mod./ High	Low	Extreme
Extinction Risk w/out management (in zoos and aquariums)	End/threat.	Extreme	Extreme	Extreme	Vulnerable	Extreme	Extreme
Extinction Risk with management (in zoos and aquariums)	Decreases	Stable	Stable	Stable	Decreases	Stable	N/A
Demand within AZA	Moderate	Low	Moderate	Low	High	Moderate	Low
Institutional Commitment	High	Low	Moderate	Low	High	High	Low
Ease of Breeding	Low	Low	Moderate	Moderate	High	Moderate	Extreme
Extinction Risk (wild) IUCN designation	Least concern	Vulnerable	Vulnerable	Least concern	Least concern	Endangered	Least concern
Acquisition cost (outside AZA)	High	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Program operating costs	High	Moderate	Moderate	Moderate	Low	Moderate	Moderate
International program	No	No	No	No	No	Yes	No
Link to conservation of wild populations	Direct	Indirect	Direct	Indirect	Direct	Direct	None
N. American governmental conservation program	Yes	No	Yes	No	No	Yes	No
	SSP - 10 PMP - 2 DERP - 1	SSP - 1 PMP - 4 DERP - 8	SSP - 5 PMP - 6 DERP - 2	SSP - 1 PMP - 4 DERP - 8	SSP - 4 PMP - 7 DERP - 2	SSP - 8 PMP - 3 DERP - 2	SSP - 0 PMP - 2 DERP - 10
MANAGEMENT DESIGNATION	**See species worksheet for explanation**	**DERP**	**PMP**	**PO**	**PMP**	**See species worksheet for explanation**	**DERP**

**** Not currently in AZA facilities but has been exhibited in the past. Will be DERP when/if available through stranding network.**

TABLE 4 (cont.) - ***Management Designation Assessment*** **- PINNIPEDS**

CRITERIA	**Gray seal**	**Harbor seal**	**Harp seal**	**Hawaiian monk seal**	**Hooded ** seal**	**Ringed ** seal**	
Availability within AZA	Moderate	Moderate	Extreme	Extreme	Extreme	Extreme	
Availability outside AZA	Moderate	Moderate	Moderate	Extreme	Extreme	Extreme	
Extinction Risk w/out management (in zoos and aquariums)	Vulnerable	Vulnerable	Vulnerable	Extreme	Extreme	Extreme	
Extinction Risk with management (in zoos and aquariums)	Stable	Stable	Stable	Stable	Stable	Stable	
Demand within AZA	Moderate	Moderate	Low	Low	Low	Low	
Institutional Commitment	Moderate	Mod /High	Low	Low	Low	Low	
Ease of Breeding	Moderate	Moderate	Unknown	Extreme	Extreme	Unknown	
Extinction Risk (wild) IUCN designation	Least concern	Least concern	Least concern	Endangered	Least concern	Least concern	
Acquisition cost (outside AZA)	Low	Low	Low	Moderate	Low	Low	
Program operating costs	Low	Low	Low	Low	Low	Low	
International program	No	No	No	No	No	No	
Link to conservation of wild populations	Indirect	Direct	Indirect	Direct	None	Indirect	
N. American governmental conservation program	No	No	No	Yes		No	
	SSP - 1 PMP - 9 DERP - 3	SSP - 2 PMP - 8 DERP - 3	SSP- 0 PMP- 5 DERP- 7	SSP - 3 PMP - 1 DERP - 9	SSP - 0 PMP - 0 DERP - 13	SSP - 0 PMP - 1 DERP - 12	
MANAGEMENT DESIGNATION	**PMP**	**PMP**	**DERP**	**DERP**	**DERP**	**DERP**	
**** Not currently in AZA facilities but identified as species of interest for future. Will be DERP when/if available through stranding network.**							

*TABLE 5 - **Management Designation Assessment** - **CETACEANS***

CRITERIA	**Bottlenose dolphin**	**Commerson's dolphin**	**Short-beaked Common dolphin**	**Indo-Pacific bottlenose dolphin**	**Pacific white-sided dolphin**	**Pantropical spotted dolphin**	**Spinner dolphin**
Availability within AZA	Moderate	Extreme	Extreme	Extreme	Low	Extreme	Extreme
Availability outside AZA	Low	Extreme	Extreme	Moderate	Low	Extreme	Extreme
Extinction Risk w/out management (in zoos and aquariums)	Vulnerable	Extreme	Extreme	End/threat	Extreme	Extreme	Extreme
Extinction Risk with management (in zoos and aquariums)	Decreases	Stable	Stable	Stable	Decreases	Stable	Stable
Demand within AZA	Moderate	Low	Low	Low	High	Low	Low
Institutional Commitment	High	Low	Low	High	High	Low	Low
Ease of Breeding	High	Moderate	Extreme	High	Moderate	Unknown	Unknown
Extinction Risk (wild) IUCN designation	Data Deficient	Data Deficient	Least concern	Data Deficient	Least concern	Least concern	Data Deficient
Acquisition cost (outside AZA)	High	High	High	High	High	High	High
Program operating costs	High	High	High	High	High	High	High
International program	No	No	No	Yes	No	No	No
Link to conservation of wild populations	Direct	Indirect	Indirect	Direct	Direct	Direct	Direct
N. American governmental conservation program	No	No	No	No	No	No	No
	SSP - 5 PMP - 7 DERP - 1	SSP - 3 PMP - 1 DERP - 9	SSP - 2 PMP - 1 DERP - 10	SSP - 6 PMP - 1 DERP - 6	SSP - 9 PMP - 1 DERP - 3	SSP - 3 PMP - 0 DERP - 8	SSP - 3 PMP - 0 DERP - 8
MANAGEMENT DESIGNATION	**PMP**	**DERP**	**DERP**	**DERP**	**See species worksheet for explanation**	**DERP**	**DERP**

TABLE 5 (cont.) - ***Management Designation Assessment*** **- CETACEANS**

CRITERIA	**Beluga whale**	**Killer whale**	**False killer whale**	**Short-finned pilot whale**			
Availability within AZA	Low	Extreme	Extreme	Extreme			
Availability outside AZA	Low	Extreme	Extreme	Extreme			
Extinction Risk w/out management (in zoos and aquariums)	End/threat.	Extreme	Extreme	Extreme			
Extinction Risk with management (in zoos and aquariums)	Stable	Decreases	Stable	Stable			
Demand within AZA	High	Low	Low	Low			
Institutional Commitment	High	High	Low	Low			
Ease of Breeding	Moderate	Moderate	Low	Extreme			
Extinction Risk (wild) IUCN designation	Vulnerable	Least concern	Least concern	Least concern			
Acquisition cost (outside AZA)	High	High	High	High			
Program operating costs	High	High	High	High			
International program	No	No	No	No			
Link to conservation of wild populations	Direct	Direct	Indirect	Indirect			
N. American governmental conservation program	Yes	No	No	No			
	SSP - 11 PMP - 2 DERP - 0	SSP - 5 PMP - 1 DERP - 7	SSP - 3 PMP - 2 DERP - 8	SSP - 2 PMP - 2 DERP - 9			
MANAGEMENT DESIGNATION	**SSP**	**DERP**	**DERP**	**DERP**			

TABLE 6 - ***Program Recommendations*** **- SEA OTTERS and MANATEES**

SPECIES	PROGRAM	ROLE AND PURPOSE	TARGET POPULATION	COORDINATOR/Species Champion
West Indian manatee *Trichechus manatus*	**DERP**	Conservation Education	**n/a**	**Virginia Edmonds**, Lowry Park Zoo Phone: 813-935-8552 ext 264 Fax: 813-930-0106 E-mail: virginia.edmonds@lowryparkzoo.com
Northern sea otter *Enhydra lutris kenyoni* **Southern sea otter** *Enhydra lutris nereis*	**DERP**	Conservation Education; Research	**n/a**	**CJ Casson**, Seattle Aquarium Phone:206-386-4372 Fax: 206-386-4328 E-mail: cj.casson@seattle.gov

*TABLE 7 – **Program Recommendations** -* PINNIPEDS

SPECIES	PROGRAM	ROLE AND PURPOSE	TARGET POPULATION	COORDINATOR/Species Champion
Walrus *Odebenus rosmarus*	**PMP**	Conservation Education; Research	**40**	**Lisa Oland**, Indianapolis Zoo Phone: 317-630-2184 E-mail: loland@indyzoo.com
Guadalupe fur seal *Arctocephalus townsendi*	**DERP**	Conservation Education	**n/a**	**Derek Woodie,** Point Defiance Zoo Phone: (253) 404-3671 E-mail: derek.woodie@pdza.org
Northern fur seal *Callorhinus ursinus*	**PMP**	Conservation Education; Research	**32**	**Gayle Sirpenski,** Mystic Aquarium Phone: 860-572-5955 x108 E-mail: gsirpenski@mysticaquarium.org
Brown fur seal *Arctocephalus pusillus*	**PO**		**n/a**	
California sealion *Zalophus californianus*	**PMP**	Conservation Education; Research	**361**	**Jennifer McGee**, Brookfield Zoo Phone: 708-688-8441 E-mail: Jennifer.mcgee@czs.org
Steller sea lion *Eumetopias jubatus*	**DERP**	Conservation Education; Research	**n/a**	**Gayle Sirpenski**, Mystic Aquarium Phone: 860-572-5955 x108 E-mail: gsirpenski@mysticaquarium.org
Elephant seal *Mirounga angustirostris*	**DERP**		**n/a**	Species Champion will be sought if necessary
Gray seal *Halichoerus grypus*	**PMP**	Conservation Education	**30**	**Rita Stacey**, Brookfield Zoo Phone: 708-688-8442 E-mail: rita.stacey@czs.org
Harbor seal *Phoca vitulina*	**PMP**	Conservation Education; Research	**159**	**Megan Wright**, Blank Park Zoo Phone: 515-323-8385 E-mail: mmwright@blankparkzoo.org
Harp seal *Pagophilus groenlandicus*	**DERP**	Conservation Education	**n/a**	**Rita Stacey**, Brookfield Zoo Phone: 708-688-8442 E-mail: rita.stacey@czs.org
Hawaiian monk seal *Monachus schauinslandi*	**DERP**	Conservation Education	**n/a**	**Pat Sassic,** Sea World, San Antonio Phone: 210-523-3285 E-mail: pat.sassic@seaworld.com
Hooded seal *Cystophora cristata*	**DERP**		**n/a**	Species Champion will be sought if necessary
Ringed seal *Pusan hispida*	**DERP**		**n/a**	Species Champion will be sought if necessary

*TABLE 8 –**Program Recommendations -*** **CETACEANS**

SPECIES	PROGRAM	ROLE AND PURPOSE	TARGET POPULATION	COORDINATOR/Species Champion
Bottlenose dolphin *Tursiops truncatus*	**PMP**	Conservation Education; Research	**210**	**Marilyn Dudley**, SeaWorld Phone: (619) 226-3900 X 2411 E-mail: Marilyn.Dudley@SeaWorld.com
Commerson's dolphin *Cephalorhynchus commersonii*	**DERP**	Conservation Education	**n/a**	**Marilyn Dudley**, SeaWorld Phone: (619) 226-3900 X 2411 E-mail: Marilyn.Dudley@SeaWorld.com
Short-beaked common dolphin *Delphinus delphis*	**DERP**	Conservation Education;	**n/a**	**Vacant**
Indo-Pacific bottlenose dolphin *Tursiops aduncus*	**DERP**	Conservation Education;	**n/a**	**Loretta Ho**, Ocean Park, Hong Kong E-mail: Loretta.ho@oceanpark.com.hk
Pacific white-sided dolphin *Lagenorhynchus obliquidens*	**DERP**	Conservation Education; Research	**n/a**	**Lisa Takaki**, Shedd Aq Phone: 312-692-3236 E-mail: ltakaki@sheddaquarium.org
Pantropical spotted dolphin *Stenella attenuata*	**DERP**	Conservation Education;	**n/a**	**Vacant**
Spinner dolphin *Stenella longirostris*	**DERP**	Conservation Education;	**n/a**	**Vacant**
Beluga whale *Delphinapterus leucas*	**SSP**	Conservation Education; Research	**50**	**(Studbook) Derek Woodie,** Point Defiance Zoo Phone: (253) 404-3671 E-mail: derek.woodie@pdza.org **Coordinator:** Vacant
Killer whale *Orcinus orca*	**DERP**	Conservation Education; Research	**n/a**	**Brad Andrews**, SeaWorld Phone: (407) 363-2661 E-mail: brad.andrews@anheuser-busch.com
False killer whale *Pseudorcas crassidens*	**DERP**	Conservation Education	**n/a**	**Derek Woodie,** Point Defiance Zoo Phone: (253) 404-3671 E-mail: derek.woodie@pdza.org
Short-finned pilot whale *Globicephala macrorhynchus*	**DERP**	Conservation Education	**n/a**	**Marilyn Dudley**, SeaWorld Phone: (619) 226-3900 X 2411 E-mail: Marilyn.Dudley@SeaWorld.com

SPECIES RECOMMENDATION WORKSHEETS

The following **Species Worksheets** have been included to provide marine mammal managers with concise information on captive population numbers**,** the TAG's program recommendations, conservation status, and special concerns regarding the husbandry and management of the marine mammals in our collections.

A target size planning meeting was held at the Population Management Center (PMC) at Lincoln Park Zoo on July 29-30, 2008. Demographic and genetic analyses were conducted using the most current available studbook data and the Goal Setting screen of Population Management 2000 software (PM2000 Version 1.212). The current population size and baseline genetic analysis for each species was obtained from the population studbook for AZA institutions only unless otherwise stated. A brief summary of the demographic and genetic information has been included on each worksheet but we encourage our colleagues to view the full PMC report that accompanies this RCP. *See Appendix VI*

Northern fur seal *Callorhinus ursinus* Photo by C.J. Casson

MARINE MAMMAL TAXON ADVISORY GROUP
NORTH AMERICAN REGIONAL COLLECTION PLAN

SPECIES:	**Sea Otter (Northern & Southern)** ***Enhydra lutris kenyoni and E. l. nereis***

RECOMMENDATIONS:

Program:	**DERP**
Target population:	N/A
Program Role and Purpose:	Conservation Education, Research, Display

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Species Champion:	C.J. Casson Seattle Aquarium cj.casson@seattle.gov
AZA POPULATION:	48
NUMBER OF INSTITUTIONS:	16

OTHER CAPTIVE POPULATIONS:

North America (non-AZA)	48 in 16 institutions
Europe	5 in 3 institutions
Japan	52 in 19 institutions

WILD POPULATION STATUS:

CITES:	Appendix I (Southern) and II (Northern)
IUCN:	Endangered
Other:	In Canada, endangered (COSEWIC) MMPA Depleted (Southern); Northern not listed ESA Threatened (Southern) Strategic stock SW AK (Northern)

HUSBANDRY CONSIDERATIONS AND MIXED-SPECIES MANAGEMENT POTENTIAL: Sea otters require continuous clean salt water maintained around 55 degrees Fahrenheit. As this species can consume approximately 25% of its body weight per day of high quality seafood, the cost of feeding one sea otter can be as much as $20,000 per year. Although there have been successful unisex exhibits, there has been little experience holding more than one male in the same exhibit as females and this is not recommended.
As there is minimal experience holding this species in mixed-species exhibits, extreme caution should be exercised. Refer to the Sea Otter Animal Care Manual for additional important information.

ADDITIONAL PROGRAM INFORMATION: With the exception of a few captive births, all sea otters are "rescue" animals and covered under a LOA from USFWS. This agency has made it clear that the two sub-species (northern and southern) should not be mixed unless they are held in unisex exhibits or are on proven birth control. USFWS has also made it clear that captive breeding of southern sea otters and the SW northern stock is prohibited. Further, with the listing of the South West Alaska Depleted Population Segment, of northern sea otters, USFWS is not allowing captive breeding of this sub-species and on every LOA that has been written since the listing, it is clearly stated that captive breeding is not allowed. In the event of a catastrophic event such as an oil spill where large groups of non-listed sea otters come into captivity, it is feasible that the "no-breeding" plan could be reevaluated by USFWS. For this reason, the MMTAG would like to maintain an up-to-date sea otter studbook, but follow the manatee example and manage the population as a DERP.

MARINE MAMMAL TAXON ADVISORY GROUP
NORTH AMERICAN REGIONAL COLLECTION PLAN

SPECIES:	**West Indian Manatee** ***Trichechus manatus***

RECOMMENDATIONS:

Program:	**DERP**
Target population:	N/A
Program Role and Purpose:	Conservation Education, Research, Display

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Species Champion:	Virginia Edmonds Lowry Park Virginia.edmonds@lowryparkzoo.com
AZA POPULATION:	17
NUMBER OF INSTITUTIONS:	6

OTHER CAPTIVE POPULATIONS:

North America (non-AZA)	
Europe:	

WILD POPULATION STATUS:

CITES:	Appendix I
IUCN:	Vulnerable
Other:	USFWS – Endangered MMPA – Strategic stock

HUSBANDRY CONSIDERATIONS AND MIXED-SPECIES MANAGEMENT POTENTIAL The West Indian Manatee can be housed in fresh, salt or brackish water. Water treatment can be performed with ozone or chlorine. Chlorine levels should not exceed 3 ppm. Water temperatures can range between 72 and 90 degrees, but should not fall below 68 degrees without consequence to animal health. Manatee diet can consist of a variety of produce including romaine lettuce, cabbage, kale, endive and escarole. Collecting and offering a natural diet such as water hyacinth (*Eichhoria crassipes*) and hydrilla (*hydrilla verticullata*) is a requirement under the USFWS standards for manatee rehabilitation and release. Manatees can be housed as individuals or in a group. Males and females can be housed together as long as they are of non-breeding age. Breeding adults must be kept in gender specific groups only.

ADDITIONAL PROGRAM USFWS recognizes *T. manatus* as the West Indian manatee and does not delineate between the Florida and Caribbean subspecies. This population is being overseen by the USFWS and breeding is not allowed. The current AZA populations are the result of an active rehabilitation program. Although not likely, any animal may be considered for release to the wild in the future. A studbook will be maintained to assist USFWS with the tracking of these animals. Therefore, the MM TAG has recommended this population to be maintained as a DERP.

MARINE MAMMAL TAXON ADVISORY GROUP
NORTH AMERICAN REGIONAL COLLECTION PLAN

SPECIES:	**Walrus** ***Odobenus rosmarus***

RECOMMENDATIONS:

Program:	**PMP**
Target population:	40
Program Role and Purpose:	Conservation Education, Public display

Program Leader:	Lisa Oland Indianapolis Zoo loland@indyzoo.com
AZA POPULATION:	22
NUMBER OF INSTITUTIONS:	7

OTHER CAPTIVE POPULATIONS:

North America (non-AZA)	2 (Pacific) 1 (Atlantic)
Europe:	unknown
Asia:	unknown

WILD POPULATION STATUS:

CITES:	Appendix III
IUCN:	Data deficient
Other:	MMPA - Not Depleted/ non-candidate

HUSBANDRY CONSIDERATIONS AND MIXED-SPECIES MANAGEMENT POTENTIAL Walrus are easily trained to participate in their own health care by using operant conditioning. Refer to the Walrus Animal Care Manual for additional important information on special health considerations. Walrus have been housed with California sea lions, fur seals and harbor seals. Large alpha males should not be housed with other species. In general however it is not recommend to house walrus with other species due to their large size and exhibit needs.

ADDITIONAL PROGRAM INFORMATION Only the Pacific Walrus is acknowledged as being housed in AZA facilities. The US Fish and Wildlife Service maintains oversight of all captive walrus. AZA has a long history of cooperation with this agency. The reduction of sea ice is expected to have a significant impact on the future of the wild populations. There have been ongoing discussions with USFWS regarding best strategies and thoughts regarding a potential increase of orphaned calves. To date, very few specimens have been available through this avenue (<.5 per year). AZA facilities committed to the conservation of this species will continue to work with USFWS on their management. Three additional facilities have expressed an interest in acquiring walrus, increasing the number of available spaces to over double the current population. In order to further our knowledge and understanding of basic biological parameters, breeding is encouraged.

Demographic summary: Demographic data is based on very small sample sizes. Infant mortality is relatively high. According to the database, females have bred at ages 10 – 27; males have bred at ages 13 – 28. Records indicate that the oldest male is 31 (currently alive now) and the oldest female lived to age 33.

Genetic summary: This population is comprised of eighteen wild born individuals and four animals born in zoos/aquariums. Fourteen potential founders remain. Genetic projections were not conducted for this population.

The status of Pacific walrus in North American Institutions is entering a period of potentially great transition. The current population numbers are too low to support a sustained population. All AZA institutions holding walrus are currently involved in discussions and planning relative to the species' long term future in North American facilities. The USFWS is soon to make a decision on status listing for the species based on projections of the loss of sea ice. The TAG recommends this species be managed as a PMP until such time as status in the wild, specimen availability, and long term institutional commitments have better definition.

MARINE MAMMAL TAXON ADVISORY GROUP
NORTH AMERICAN REGIONAL COLLECTION PLAN

SPECIES: **Guadalupe Fur Seal**
Arctocephalus townsendi

RECOMMENDATIONS:

Program:	**DERP**
Target population:	N/A
Program Role and Purpose:	Conservation Education, Display

Species Champion: Derek Woodie
Point Defiance Zoo and Aquarium
Tacoma WA, USA
derek.woodie@pdza.org

AZA POPULATION: 1

NUMBER OF INSTITUTIONS: 1

OTHER CAPTIVE POPULATIONS: 0
North America (non-AZA)
Europe: Unknown

WILD POPULATION STATUS:

CITES:	Appendix I
IUCN:	Near Threatened
Other:	MMPA – Depleted/Strategic

HUSBANDRY CONSIDERATIONS AND MIXED-SPECIES MANAGEMENT POTENTIAL: This species exhibits extreme sexual dimorphism. Males average 189 kg while females average 49 kg. Guadalupe fur seals have been housed with California sea lions and harbor seals.

ADDITIONAL PROGRAM INFORMATION The wild population has been increasing at ~10% per year and expanding their home range into California. The current population is estimated to be 12 to 15,000 individuals. This is still the rarest of all the fur seal species, a possible reason so few have been housed in zoological facilities. They have a low fecundity rate and exhibit the longest parental care for fur seals. Recent Unusual Mortality Events (UME) and standings for this species have been reported along the Oregon and Washington coasts and as far north as Homer, Alaska.

Demographic summary: With the increasing wild population, additional animals may become available through the stranding network.

MARINE MAMMAL TAXON ADVISORY GROUP
NORTH AMERICAN REGIONAL COLLECTION PLAN

SPECIES:	**Northern Fur Seal** ***Callorhinus ursinus***

RECOMMENDATIONS:

Program:	**PMP**
Target population:	32
Program Role and Purpose:	Conservation Education, Research, Display

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Program Leader:	Gayle Sirpenski Mystic Aquarium & Institute for Exploration gsirpenski@mysticaquarium.org
AZA POPULATION:	16
NUMBER OF INSTITUTIONS:	5

OTHER CAPTIVE POPULATIONS:

North America (non-AZA)	3
Europe:	9

WILD POPULATION STATUS:

CITES:	Not listed
IUCN:	Vulnerable
Other:	MMPA Depleted ESA Strategic stock (Eastern Pacific)

HUSBANDRY CONSIDERATIONS AND MIXED-SPECIES MANAGEMENT POTENTIAL This species exhibits extreme sexual dimorphism (males can grow to 270 kg while females are 40-50 kg). Both sexes can be trained for behavioral husbandry procedures. Northern fur seals have been exhibited with harbor seals, California sea lions, and Steller sea lions.

ADDITIONAL PROGRAM INFORMATION Northern fur seals were successfully bred in captive collections during the 1980's and 90's. This species is now faced with a declining population through attrition, as well as a lack of females for breeding. There is a renewed interest within the AZA community to maintain this species and additional exhibit space has been identified. Efforts are underway to place appropriate animals in breeding situations.
Demographic summary: This population is currently declining. First–year mortality appears to be high based on the small number of births recorded so far (< 40). Approximately 2-3 births or imports per year are necessary to keep the population at its current size.
Genetic summary: The current population is descended from 10 founders. There are currently no potential founders in the population.

The TAG recommends bringing in additional stranded or orphaned animals to augment the genetic potential of the population. This population would benefit from additional space. With enough additional founders and a focus on breeding, this population would be able to meet genetic goals of a less than 10% loss of gene diversity over 100 years (Scenario D in PMC report).

SPECIES:	**California Sealion** ***Zalophus californianus***

RECOMMENDATIONS:

Program:	**PMP**
Target population:	361
Program Role and Purpose:	Conservation Education, Research, Public display

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Program Leader: Jennifer McGee
Brookfield Zoo
jennifer.mcgee@czs.org

AZA POPULATION: 313

NUMBER OF INSTITUTIONS: 45

OTHER CAPTIVE POPULATIONS:

North America (non-AZA)	110
Europe:	248
Asia:	26

WILD POPULATION STATUS:

CITES:	Not listed
IUCN:	Least concern
Other:	MMPA - Not Depleted/ non-candidate

HUSBANDRY CONSIDERATIONS AND MIXED-SPECIES MANAGEMENT POTENTIAL California sea lions are physically robust animals that are generally easy to care for and are long lived. Many facilities include California sea lions in public presentations and entertainment venues. Because of the investment in their training, facilities have been some what reluctant to transfer animals for breeding purposes. There is some evidence to suggest that maintaining animals in fresh water exacerbates eye conditions. California sea lions have been successfully maintained with bottlenose dolphins, beluga whales, harbor seals, gray seals and northern fur seals.

ADDITIONAL PROGRAM INFORMATION There is a strong interest within the AZA community to continue displaying this species. However, the species has been faced with a declining population through attrition which has limited the availability of animals. The majority of AZA facilities have not been breeding which has also had a negative impact on the demographics and genetics of the population. This species breeds well in captive collections and the TAG strongly encourages future cooperation among AZA institutions. There is a potential to increase in the collection size with rehabilitated animals from the stranding facilities.
Demographic summary: This population has been sustained by both periodic imports of stranded or orphaned animals as well as by zoo & aquarium births. Demographic projections based on estimated birth and death rates indicate that approximately 30 – 35 births or imports per year would be necessary to increase the AZA population to the estimated 5 – year capacity of 361.
Genetic summary: This population is able to meet long-term genetic goals of 90% gene diversity for 100 years with the current target population size. In fact, because of the large number of founding animals (84 founders and 28 additional potential founders) and high starting gene diversity, this population would actually be able to meet genetic goals with a smaller target size (250).

The main focus of this population should be demographic, breeding animals (using mean kinship) and creating a self-sustaining population with a more stable age structure (Scenario A in PMC report).

MARINE MAMMAL TAXON ADVISORY GROUP
NORTH AMERICAN REGIONAL COLLECTION PLAN

SPECIES:	**Steller Sea Lion** ***Eumetopias jubatus***

RECOMMENDATIONS:

Program:	**DERP**
Target population:	N/A
Program Role and Purpose:	Conservation Education, Research, Display

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Species Champion:	Gayle Sirpenski Mystic Aquarium & Institute for Exploration gsirpenski@mysticaquarium.org
AZA POPULATION:	22
NUMBER OF INSTITUTIONS:	3

OTHER CAPTIVE POPULATIONS:

North America (non-AZA)	3
Europe:	9

WILD POPULATION STATUS:

CITES:	Not listed
IUCN:	Endangered
Other:	ESA Eastern stock threatened MMPA - Depleted

HUSBANDRY CONSIDERATIONS AND MIXED-SPECIES MANAGEMENT POTENTIAL: Adult, intact males tend to be aggressive towards conspecifics and other species. Females have been successfully integrated with harbor seals, northern fur seals and California sea lions.

ADDITIONAL PROGRAM INFORMATION Steller sea lions have bred successfully at a number of institutions in the past. The last captive birth in the US was in 1987. However, the current population is small with skewed demographics (neutered males and aged females). Due to endangered status, there are difficulties with permits bringing animals into the US.
Demographic summary: This population is demographically unstable due to its small size and heavily female biased structure. Additional males would be required to create a more stable population.
Genetic summary: The population is comprised of mostly potential founders (16) who have not yet bred, with a potential gene diversity of 97.22%. If these potential founders were to successfully breed, the population would have a good start towards becoming a genetically healthy zoo/aquarium population.

The TAG plans to keep this population as a DERP because of low institutional interest currently, low likelihood of breeding due to space and behavioral issues. The TAG would like to recruit at least two additional institutions. If this population were to become a more intensively managed program (PMP or SSP), males would need to be added and the potential founders would need to be bred to start the population towards a more genetically and demographically healthy population.

MARINE MAMMAL TAXON ADVISORY GROUP
NORTH AMERICAN REGIONAL COLLECTION PLAN

SPECIES:	**Gray Seal** ***Halichoerus grypus***

RECOMMENDATIONS:

Program:	**PMP**
Target population:	30
Program Role and Purpose:	Display, Conservation Education

Program Leader:	Rita Stacey Chicago Zoological Society – Brookfield Zoo rita.stacey@czs.org
AZA POPULATION:	25
NUMBER OF INSTITUTIONS:	11

OTHER CAPTIVE POPULATIONS:

North America (non-AZA)	3 in 2 institutions
Europe	61 in 18 institutions
Asia	1 in 1 institution

WILD POPULATION STATUS:

CITES:	Not listed
IUCN:	Least concern
Other	MMPA – Non depleted/non-candidate

HUSBANDRY CONSIDERATIONS AND MIXED-SPECIES MANAGEMENT POTENTIAL: This unique looking phocid provides variety to the commonly exhibited harbor seal within a pinniped collection. They are fairly long lived animals; some reaching late 30's to early 40s. There has been good success with breeding in zoos and aquariums; approximately half of the current population is captive born. Gray seals have been successfully housed with harbor seals and California sea lions. It would be reasonable to assume that gray seals would also do well housed with other small phocid species.

ADDITIONAL PROGRAM INFORMATION: While the current gray seal population is small, there is a consistent commitment within the AZA community to maintain this population with some interest from other facilities not currently maintaining gray seals. There is a potential for the addition of founder representatives resulting from rehabilitated animals brought into the collection.
Demographic summary: Based on the modified demographic data, at least 3 births or imports are necessary to maintain the population at its current size. Approximately 7 births or imports would be needed to increase to the proposed target size.
Genetic summary: There are currently 8 potential founders in the AZA population. Recruiting at least half of these animals would increase the gene diversity to approximately 92%.

For now the TAG will manage gray seals at a target size of 30 with a reliance on imports. (Scenario C. in PMC report) We suggest that additional spaces from a more stable seal population (e.g., harbor seals) are used for future gray seal management.

MARINE MAMMAL TAXON ADVISORY GROUP
NORTH AMERICAN REGIONAL COLLECTION PLAN

SPECIES:	**Harbor Seal** ***Phoca vitulina***

RECOMMENDATIONS:

Program:	**PMP**
Target population:	159
Program Role and Purpose:	Conservation Education; Research, Public display

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Program Leader: Megan Wright
Blank Park Zoo
mmwright@blankparkzoo.org

AZA POPULATION: 160

NUMBER OF INSTITUTIONS: 31

OTHER CAPTIVE POPULATIONS:

North America (non-AZA)	25
Europe	155
Asia	8

WILD POPULATION STATUS:

CITES:	Not Listed
IUCN:	Least concern
	MMPA – Non-depleted/non-candidate

HUSBANDRY CONSIDERATIONS AND MIXED-SPECIES MANAGEMENT Harbor seals are easily trained to participate in their own health care using operant conditioning or positive reinforcement. Harbor seals have been successfully exhibited with California seal lions, northern fur seals, female Steller sea lions, gray seals, beluga whales and sea otters.

ADDITIONAL PROGRAM INFORMATION This species has been faced with declining availability without a formal breeding plan. There is a continued interest within the AZA community to maintain this species. There is a potential for an increase in the collection size resulting from opportunistic rehabilitated animals.
Demographic summary: This population has been increasing due primarily to zoo & aquarium births. Approximately 13 births or imports per year are necessary to keep the population at its current size. Approximately 19 births or imports per year are necessary to grow the population to the target size of 187.
Genetic summary: Even with unknown pedigree issues, this population's genetic outlook is projected to be very optimistic, with a large founder base and the possibility of regular imports from the wild.

This population has been breeding fairly well and with good genetic management. It can most likely meet genetic goals with either the current or 5-year projected population sizes (Scenarios B and C of PMC report). Additional space would not significantly improve the outlook for this species and some space used for harbor seals could be allocated for a species in greater need.

MARINE MAMMAL TAXON ADVISORY GROUP
NORTH AMERICAN REGIONAL COLLECTION PLAN

SPECIES:	**Hawaiian Monk Seal** ***Monachus schauinslandi***

RECOMMENDATIONS:

Program:	**DERP**
Target population:	N/A
Program Role and Purpose:	Conservation Education, Public display

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Species Champion:	Pat Sassic Sea World of San Antonio pat.sassic@seaworld.com
AZA POPULATION:	8
NUMBER OF INSTITUTIONS:	1

OTHER CAPTIVE POPULATIONS:

North America (non-AZA)	2	Waikiki Aquarium
	3	Sea Life Park Hawaii

WILD POPULATION STATUS:

CITES:	Appendix I
IUCN:	Critically Endangered
Other:	USFWS – Endangered MMPA - Depleted

HUSBANDRY CONSIDERATIONS AND MIXED-SPECIES MANAGEMENT POTENTIAL: Scientists consider Hawaiian monk seals to be living fossils, as many of their anatomical features have only been slightly modified from the earliest fossils, 14-16 million years ago. Hawaiian monk seals have a slender body, short flippers, and a relatively small, broad and flat head. Found on sandy beaches and surrounding waters of the Northwestern Hawaiian Islands and main Hawaiian Islands. They feed on a variety of fish, cephalopods, and crustaceans. Most animals are housed in single sex pairs. Additionally, some have been exhibited with harbor seals. Captive breeding is prohibited at this time. No diet concerns or special considerations. Data is being collected on concerns with infectious diseases and age related issues, i.e.; eye problems.

ADDITIONAL PROGRAM INFORMATION: The Hawaiian monk seal's management is overseen by the USFWS. This species is protected under the Endangered Species act 1976, IUCN, and CITES. The captive population is being maintained at one AZA facility and two non-AZA facilities. In recent years the wild population has been declining by four percent (4%) per year. Pups are born February through July, peak season is April and May. This year saw an increase in births and strandings. Historically this species has a very low juvenile survival rate due to lack of nutrients, decreased food availability for some populations, human disturbance, habitat loss, predation, entanglement, and incidental capture in fishing gear and ingestion of fisheries debris or toxic substances. Biologists estimate there are 1,100 individuals, putting this seal as one of the world's most endangered species. Some conservation strategies include protection of critical habitat, rehabilitation and release of undersized pups, identification of reproductive habitats. A captive breeding program is also advocated by some scientists.

MARINE MAMMAL TAXON ADVISORY GROUP
NORTH AMERICAN REGIONAL COLLECTION PLAN

SPECIES: **Bottlenose Dolphin**
Tursiops truncatus

RECOMMENDATIONS:

Program:	**PMP**
Target population:	210
Program Role and Purpose:	Conservation Education, Research, Display

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Program Leader: Marilyn Dudley
Sea World, San Diego
Marilyn.Dudley@SeaWorld.com

AZA POPULATION: 210

NUMBER OF INSTITUTIONS: 9

OTHER CAPTIVE POPULATIONS (non-AZA):

N. America/Caribbean/Mexico/The Bahamas	416 in 27 participating institutions
South America	
Europe	

WILD POPULATION STATUS:

CITES:	Appendix II
IUCN:	Least concern
Other:	

HUSBANDRY CONSIDERATIONS AND MIXED-SPECIES MANAGEMENT POTENTIAL: Bottlenose dolphins have been successfully housed with a number of cetacean species. Social dynamics between the ages and gender of animals should be considered since sub-adult and adult male bottlenose dolphins can be combative with conspecifics and with other cetacean species. Compatible male groups usually number no more than 3 or 4 individuals. Older males and female bottlenose dolphins tend to be more easily assimilated into mixed groups. During parturition and calf rearing a compatible, small group of females and Pacific White-sided dolphins have been successful. Species such as Pilot and Killer whales have had some fatal or near fatal interactions with the neonate calves. Hybridization has occurred. Bottlenose dolphins should be maintained with species that require the same temperature parameters (temperate-sub tropical).

ADDITIONAL PROGRAM INFORMATION: Artificial insemination techniques, including sex selection, are being used by a few facilities to better facilitate long-term genetic management of the population, reduce risk to animals during transport and cause less disruption to a stable group.
Demographic summary: Approximately 13 births per year are required to offset deaths and keep this population at its current size. Historically, this population exceeded this number of births and has been growing at an average rate of about 1%.
Genetic summary: Due to the large founder base, healthy effective population size, and a positive growth rate, the AZA population of bottlenose dolphins can meet genetic goals with the current population size of 210. With few species competing for *Tursiops* space and a current population size well above the size necessary to meet genetic goals, the target size for this species can be based on institutional demand rather than population management goals.

SPECIES: **Commerson's Dolphin**
Cephalorhynchus commersonii

RECOMMENDATIONS:

Program:	**DERP**
Target population:	N/A
Program Role and Purpose:	Conservation Education, Display

Species Champion: Marilyn Dudley
Sea World/Mammal Dept.
Marilyn.Dudley@SeaWorld.com

AZA POPULATION: 7

NUMBER OF INSTITUTIONS: 2

OTHER CAPTIVE POPULATIONS:

North America (non-AZA)	0
South America	
Europe	

WILD POPULATION STATUS:

CITES:	Appendix II
IUCN:	Data Deficient
Other:	MMPA - Non-depleted/non-candidate

HUSBANDRY CONSIDERATIONS AND MIXED-SPECIES MANAGEMENT POTENTIAL: A small colony of Commerson's dolphins has been maintained at Sea World since 1983. They are quick and agile swimmers. Because of their high metabolic rate and relatively short attention span, they require more feeds/sessions. At times, when they are more socially active, they might take a feed or two off and interact with the other dolphins. Training sessions are short and the process requires more and smaller steps to reach a husbandry or management behavior goal (unrestrained blood, separations, gating). A significant amount of time is needed to adjust to new environment/pool and work out social differences with pool mates and may require separation or medication for some period of time. This species seems to do better in colder water (55 – 60 degrees Fahrenheit). Through extensive conditioning and rehearsals, the dolphins transport long distances well.
Commerson's dolphins have been successfully exhibited with beluga whales (*Delphinaptera leucas*). Hybridization has not occurred at SeaWorld.

ADDITIONAL PROGRAM INFORMATION: A long-term management of the population is at risk. Commerson's dolphins are not endangered or considered threatened. They are, however, a rare species (population is small and relatively isolated). Their numbers seem stable, but increasing boat traffic, over-fishing, oil drilling, and fish net entanglement could quickly threaten this population of dolphins.

SPECIES: **Indo-Pacific Bottlenose Dolphin**
Tursipos aduncus

RECOMMENDATIONS:

Program:	**DERP**
Target population:	N/A
Program Role and Purpose:	Conservation Education, Display

Species Champion: Loretta Ho
Ocean Park, Hong Kong
Loretta.ho@oceanpark.com.hk

AZA POPULATION: 16

NUMBER OF INSTITUTIONS: 1

OTHER CAPTIVE POPULATIONS:

North America (non-AZA)	0
Europe:	0
SEAZA	9
ARAZPA	4

WILD POPULATION STATUS:

CITES:	Appendix II
IUCN:	Data Deficient
Other:	MMPA - Non-depleted/non-candidate

HUSBANDRY CONSIDERATIONS AND MIXED-SPECIES MANAGEMENT POTENTIAL:

ADDITIONAL PROGRAM INFORMATION One AZA member institution located overseas holds these animals and is actively managing a breeding population. There is potential for collaboration with other regional associations. Management of this species is critical to ensure the genetic viability. The MMTAG recommends that an international studbook is developed for future animal management.

MARINE MAMMAL TAXON ADVISORY GROUP
NORTH AMERICAN REGIONAL COLLECTION PLAN

SPECIES:	**Pacific white-sided dolphin** ***Lagenorhynchus obliquidens***

RECOMMENDATIONS:

Program:	**DERP**
Target population:	N/A
Program Role and Purpose:	Conservation Education; Research, Display

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Species Champion: Lisa Takaki
John G. Shedd Aquarium
ltakaki@sheddaquarium.org

AZA POPULATION: 15

NUMBER OF INSTITUTIONS: 3

OTHER CAPTIVE POPULATIONS:

North America (non-AZA)	0
South America	
Europe	

WILD POPULATION STATUS:

CITES:	Appendix II
IUCN:	Least concern
Other:	MMPA – Non-depleted/non-candidate

HUSBANDRY CONSIDERATIONS AND MIXED-SPECIES MANAGEMENT POTENTIAL: These naturally acrobatic and energetic dolphins seem to thrive in cooler water temperatures ranging from approximately 50 to 60 degrees Fahrenheit. Although typically pelagic dolphins, they acclimate to other habitats well. This species has proven to respond well to training and are easily managed for all husbandry needs. Pacific white-sided dolphins have been successfully housed with several other species: Killer whales, belugas, and pseudorcas.

ADDITIONAL PROGRAM INFORMATION: There has been limited success with natural reproduction. Due to the limited number of males within the AZA population, artificial insemination techniques are being developed for this species. Other sources of genetic material outside the current AZA population are being investigated. There is a critical need to consider all available individuals to enhance the populations' viability.
Demographic summary: This population has several demographic challenges common to small, fairly young populations. The age structure of this population is unstable--heavily female-biased with too few juveniles to support future reproduction.
Genetic summary: Some recent breeding has occurred but parentage of these six animals has not been identified in studbook records. There are ten unrepresented potential founders in the population.

Although breeding programs have been initiated by several AZA facilities, the level of success has been minimal. For now the TAG recommends this species be managed as a DERP. With future breeding success and improved demographics, the TAG will reevaluate the status of this program. In the short term, this program should focus on breeding the current potential founders and increasing the growth rate and effective population size. To meet long term genetic goals, the population will need to add founders (unrelated individuals from the wild or other regions) and recruit additional institutions to expand the population size.

SPECIES:	**Pan Tropical Spotted Dolphin** ***Stenella attenuata***

RECOMMENDATIONS:

Program:	**DERP**
Target population:	N/A
Program Role and Purpose:	Conservation Education, Public display

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Species Champion: Vacant

AZA POPULATION: 1

NUMBER OF INSTITUTIONS: 1

OTHER CAPTIVE POPULATIONS:

North America (non-AZA)	1
Europe:	
Asia	5

WILD POPULATION STATUS:

CITES:	Appendix II
IUCN:	Least concern
Other:	MMPA: Pacific north eastern offshore stock depleted

HUSBANDRY CONSIDERATIONS AND MIXED-SPECIES MANAGEMENT POTENTIAL

Pan-Tropical Spotted dolphins have typically been considered a difficult species to manage successfully; however, 1 AZA facility has been managing 1 male well for the past several years. Due to the lack of con-specifics in zoos and aquaria, the animal is being managed with a spinner dolphin. Both animals were stranded fairly young which may account for their successful transition. The pan-tropical dolphin has acclimated well to training and although slightly more reactive to new stimuli than a bottlenose dolphin, the animal has been successfully trained for all voluntary husbandry behaviors. The animal also responds well to tactile interactions with training staff and has not shown any aggression. The one current animal maintains good health, though the facility reports due to their physical delicacy, staff must be careful when handling the animal for any necessary restraints.

ADDITIONAL PROGRAM INFORMATION The TAG would not recommend a facility seek to create a collection of this species, although it is important to note the progress in their management for the placement of individuals that are deemed non-releasable after stranding events.

SPECIES:	**Spinner Dolphin** ***Stenella longirostris***

RECOMMENDATIONS:

Program:	**DERP**
Target population:	N/A
Program Role and Purpose:	Conservation Education, Public display

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Species Champion: Vacant

AZA POPULATION: 1

NUMBER OF INSTITUTIONS: 1

OTHER CAPTIVE POPULATIONS:

North America (non-AZA)	0
Europe:	

WILD POPULATION STATUS:

CITES:	Appendix II
IUCN:	Data deficient
Other:	MMPA: Eastern stock depleted

HUSBANDRY CONSIDERATIONS AND MIXED-SPECIES MANAGEMENT POTENTIAL

Much like the Pan-tropical dolphin, Spinner dolphins have typically been considered a difficult species to manage successfully; however, 1 AZA facility has been managing 1 female well for the past few years. Due to the lack of con-specifics in zoos and aquaria, the animal is being managed with a Pan-tropical dolphin. Both animals were stranded fairly young which may account for their successful transition. The Spinner dolphin has acclimated well to training and although slightly more reactive to new stimuli than a bottlenose dolphin, the animal has been successfully trained for all voluntary husbandry behaviors. The animal also responds well to tactile interactions with training staff and has not shown any aggression. The one current animal maintains good health, though the facility reports due to their physical delicacy, staff must be careful when handling the animal for any necessary restraints. This animal can be particularly sensitive to changes in diet and supplementation. It is not known at this time whether that is a species or individual characteristic due to the limited experience caring for this species.

ADDITIONAL PROGRAM INFORMATION

The TAG would not recommend a facility seek to create a collection of this species, although it is important to note the progress in their management for the placement of individuals that are deemed non-releasable after stranding events.

MARINE MAMMAL TAXON ADVISORY GROUP
NORTH AMERICAN REGIONAL COLLECTION PLAN

SPECIES:	**Beluga whale** ***Delphinapterus leucas***

RECOMMENDATIONS:

Program:	**SSP**
Target population:	50
Program Role and Purpose:	Conservation Education; Research, Display

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Studbook Keeper:	Derek Woodie Point Defiance Zoo & Aquarium derek.woodie@pdza.org
Program Leader:	Vacant
AZA POPULATION:	38
NUMBER OF INSTITUTIONS:	8

OTHER CAPTIVE POPULATIONS:

North America (non-AZA)	25
Europe	5
Asia estimate	107

WILD POPULATION STATUS:

CITES:	Appendix II
IUCN:	Near threatened
Other:	MMPA – Depleted (Cook Inlet)

HUSBANDRY CONSIDERATIONS AND MIXED-SPECIES MANAGEMENT POTENTIAL: This charismatic species has a long history in zoological collections and has bred successfully. Beluga whales have been successfully kept with harbor seals, harp seals, bottlenose dolphins, false killer whales, Commerson's dolphins, walrus, and white-sided dolphins.

ADDITIONAL PROGRAM INFORMATION: A long-standing level of cooperation exists among AZA beluga holders. Artificial insemination techniques are being developed for belugas to better facilitate long-term genetic management of the population and reduce risk to animals during transport. Acquisition of genetic material from outside the current AZA population is being investigated to strengthen genetic diversity of the AZA population.
Demographic summary: Demographic projections indicate that at least 4 births are required to offset deaths and maintain the population at its current size. Projections indicate that 6 births are necessary to grow the population to 50 animals in 10 years.
Genetic summary: Genetic projections indicate that this population could most likely reach genetic goals with careful genetic management and the addition of potential founders periodically.

The TAG has selected this population for SSP management due to the strong commitment by AZA institutions to display this species long into the future. The main focus of this program should be on demographic issues rather than genetic goals. Meeting genetic goals will require resolving demographic problems and obtaining a positive growth rate. (Scenario B of the PMC report). This program should breed as many individuals as possible and minimize first-year mortality.

SPECIES: **False Killer Whale**
Pseudorca crassidens

RECOMMENDATIONS:

Program:	**DERP**
Target population:	N/A
Program Role and Purpose:	Conservation Education, Display

Species Champion:

Derek Woodie
Point Defiance Zoo and Aquarium
derek.woodie@pdza.org

AZA POPULATION: 2

NUMBER OF INSTITUTIONS: 1

OTHER CAPTIVE POPULATIONS:
North America (non-AZA)
Europe:

WILD POPULATION STATUS:

CITES:	Appendix II
IUCN:	Data Deficient
Other:	MMPA – Non-depleted/non-candidate

HUSBANDRY CONSIDERATIONS AND MIXED-SPECIES MANAGEMENT POTENTIAL: They have been successfully bred in a captive environment and one of the two remaining individuals was captive born. Facilities housing these animals are in agreement that they seem to be less hardy that other cetacean species. Preventive medicine schedules are the same as Tursiops. Their social behavior is different than any other studied captive cetacean species. Hybridization has occurred and care should be taken when housing with other species of mixed genders. They have been housed with bottlenose dolphins, beluga whales, rough-toothed dolphin, spotted and Pan tropical spotted dolphin.

ADDITIONAL PROGRAM INFORMATION There is not a demand for an increase in this population. Few animals of this species are taken in by the stranding network and their survival rate through this process is very low. Their numbers seem stable in the wild but problems facing most marine mammals, such as increased boat traffic, pollution, global warming, and overfishing could become problems in the near future.

SPECIES:	**Killer Whale** ***Orcinus orca***

RECOMMENDATIONS:

Program:	**DERP**
Target population:	N/A
Program Role and Purpose:	Conservation Education, Research, Display

Species Champion: Brad Andrews
Sea World, Orlando
brad.andrews@anheuser-busch.com

AZA POPULATION: 23

NUMBER OF INSTITUTIONS: 4

OTHER CAPTIVE POPULATIONS:

North America (non-AZA)	5
Europe:	9

WILD POPULATION STATUS:

CITES:	Appendix II
IUCN:	Data deficient
Other:	MMPA – Depleted (transient population, Southern residents) ESA - Endangered (Southern residents)

HUSBANDRY CONSIDERATIONS AND MIXED-SPECIES MANAGEMENT POTENTIAL: This is the largest species of dolphin and the top predator of the world's oceans. These animals are very high profile and extremely costly to maintain. Adequate space, proper water temperature, nutritional food, and well trained staff are all critical meet the needs of this challenging cetacean species. Captive breeding over the last 30 years has been successful. Assisted Reproduction Techniques (ART) have been constantly improving and show promise for increased breeding potentials. These animals should not be mixed with other cetacean species, as they tend to play rough with smaller animals.

ADDITIONAL PROGRAM INFORMATION This species will be managed as a DERP due to the extremely limited availability of animals. The current collection has been successfully managed within a multi-facility institution, therefore the MM TAG recommends continuing with this strategy.

SPECIES:	**Short-finned pilot whale** ***Globicephala macrorhynchus***

RECOMMENDATIONS:

Program:	**DERP**
Target population:	N/A
Program Role and Purpose:	Conservation Education, Display

Species Champion: Vacant

AZA POPULATION: 2

NUMBER OF INSTITUTIONS: 1

OTHER CAPTIVE POPULATIONS:
North America (non-AZA)
South America
Europe

WILD POPULATION STATUS:

CITES:	Appendix II
IUCN:	Data deficient
Other:	MMPA – Non-depleted/non-candidate

HUSBANDRY CONSIDERATIONS AND MIXED-SPECIES MANAGEMENT POTENTIAL: The diet for this species should be 80-85% squid with the remaining fish being primarily herring. They are capable of learning the same training concepts taught to Tursiops. Due to their large size and strength, it is beneficial to teach these cetaceans to voluntarily accept urine and blood collection as part of routine husbandry practices. Pilot whales can be housed with other cetaceans; however they have been known to breed with Tursiops. They should not have access to enclosures with neonate Tursiops calves.

ADDITIONAL PROGRAM INFORMATION This species is a low level priority animal, primarily housed as a rehabilitated animal. There is not a direct demand for the species, nor is there a regular supply of animals through stranding events.

Program Status Table

Species	Program (SSP, PMP, Studbook)	Program Leader / Contact Information	Program Start Date	Program Leader Start Date	Last Studbook Publication Date	Last PMP /SSP Publication Date	Date of PM I course
Beluga whale	SSP Studbook	**Derek Woodie**, Point Defiance Zoo & Aquarium Phone: 253-404-3671 Fax: 253-591-5448 E-mail: Derek.Woodie@pdza.org	2008	Sept 2007	July 2009	Meeting with PMC Aug 2010	Feb 2008
Bottlenose dolphin	PMP Studbook	**Marilyn Dudley**, SeaWorld Phone: 619) 226-3900 X2411 Fax: (619) 226-3951 E-mail: Marilyn.Dudley@SeaWorld.Com	1994	Jun 1996	Jun 2008		Studbook school Feb 1997
California sealion	PMP Studbook	**Jennifer McGee**, Brookfield Zoo Phone: 708-688-8441 Fax: 708-485-3140 E-mail: jennifer.mcgee@czs.org	2003	Feb 2003	Jun 2007	Apr 2008	May 2005
Gray seal	PMP Studbook	**Rita Stacey**, Brookfield Zoo Phone: 708-688-8442 Fax: 708-485-3140. E-mail: rita.stacey@czs.org	1997	Sept 2007			On waiting list for 2009
Harbor seal	PMP Studbook	**Megan Wright**, Blank Park Zoo Phone: 515-323-8385 Fax: 515-323-8390 E-mail: mmwright@blankparkzoo.org	?	Jul 2007	Apr 2009		Feb 2008
Northern fur seal	PMP Studbook	**Gayle Sirpenski**, Mystic Aquarium Phone: 860-572-5955 x108 Fax: 860-572-5972 E-mail: gsirpenski@mysticaquarium.org	1994	Jun 1994	Sep 2006		Studbook school March 1993
Walrus	PMP Studbook	**Lisa Oland,** Indianapolis Zoo Phone: 317-630-2184 Fax: 317- 630-5153 E-mail: loland@indyzoo.com	2004	Jun 2008	May 2009		Feb 2008
Pacific white-sided dolphin	Studbook No Program	**Lisa Takaki,** John G. Shedd Aquarium Phone: 312-692-3236 Fax: 312-939-2216 E-mail:ltakaki@sheddaquarium.org	2008	Jun 2008	N/A	N/A	On list for Nov 2009
Northern & southern Sea otter	Studbook No Program	**CJ Casson,** Seattle Aquarium Phone: 206-386-4348 Fax: 206-386-4328 E-mail: cj.casson@seattle.gov	2002	Mar 2001	N/A	N/A	PM1 in 2000; PM2 in 2001
West Indian Manatee	Studbook No Program	**Virgina Edmonds**, Lowry Park Zoo Phone: 813-935-8552 ext 264 Fax: 813-930-0106 E-mail: virginia.edmonds@lowryparkzoo.com	1993	Nov 2007	N/A	N/A	2002

APPENDIX I - *Guidelines for Institutions*

Acquisition and Disposition

Accredited institutions are required to develop policies on acquisition and disposition of animals, and AZA offers direction to institutions for their development. Institutions wishing to acquire marine mammals should refer to the Marine Mammal TAG Regional Collection Plan for species selection recommendations. Program managers may be contacted directly for information on program needs, availability and sources of animals, and for goals of the program. Institutions planning to acquire animals from outside AZA should contact the respective species managers to make them aware of the planned additions to AZA populations.

Contraception

Contraception options for marine mammals have been developed by the AZA Wildlife Contraception Center (WCC) at the St. Louis Zoo. The WCC includes scientists, veterinarians, and animal managers with research and management expertise in wildlife contraception. Recommended methods of contraception for cetaceans and pinnipeds can be found on the AZA website, Animal Health page
http://www.stlzoo.org/downloads/CAGrecs2008revised.htm#pinnipeds

When considering permanent contraception, the TAG recommends that animal managers contact the appropriate Program Leader or Marine Mammal TAG Chair.

Surplus Animals

Accredited institutions are required to develop policies on surplus and disposition of animals and AZA offers direction to institutions for their development. The TAG understands that an institution's need for program or performing animals may direct the decision to breed certain individuals. It is incumbent upon each institution to proceed with breeding in a responsible manner. Program Leaders may be able to assist with the placement of surplus animals but are not obliged to do so.

Non-member Participation in Marine Mammal TAG Programs

For marine mammals managed under a SSP, the Marine Mammal TAG follows the Non-member Participation Guidelines developed by the AZA Wildlife Conservation and Management Committee (WCMC) in its relationships with non-accredited institutions. For PMP and DERP species, the TAG also recognizes the benefits of cooperating with certain non-AZA participants with like-minded goals, and supports their involvement within the guidelines of the AZA institution's Acquisition/Disposition policy.

APPENDIX II - ***Regulatory Oversight of Marine Mammals***

Marine mammals housed in zoos and aquariums in the United States fall under the jurisdiction of three federal agencies that regulate and enforce three primary laws pertaining to the conservation and management of marine mammals: the Marine Mammal Protection Act, the Endangered Species Act, and the Animal Welfare Act.

Regulatory Agencies:

1. National Marine Fisheries Service
    - The agency has oversight responsibility for collection of marine mammals from the wild, imports, and stranded marine mammals, specifically whales, dolphins, porpoises and all pinnipeds except walruses.
    - NMFS also maintains an inventory of all marine mammals in the U.S. as required by the MMPA, keeping track of transports and exports of the animals.

2. Fish and Wildlife Service
    - The agency has responsibilities similar to NMFS but for the conservation and management of sea and marine otters, walruses, polar bears, three species of manatees, and dugongs.
    - FWS is the U.S. management authority for CITES

3. Animal and Plant Health Inspection Service
    - Establishes federal minimum regulations for the care, maintenance and transport of marine mammals in public display facilities.
    - Provides licenses and registration of persons subject to the AWA (USDA Exhibitors License) and inspects all facilities to assure compliance with the rules.
    - APHIS also reviews for comparability all non-U.S. facilities to which marine mammals in the U.S. are exported.

Because of the tremendous amount of administrative and enforcement overlap between the NMFS, FWS and APHIS, they have entered into a Memorandum of Understanding that outlines their relative responsibilities and authorities under the MMPA, the ESA and the AWA. **Care must be taken to ensure all animal managers work in close contact with representatives from all pertinent agencies when planning to obtain or maintain marine mammals in their AZA zoos and aquariums.**

Most marine mammal issues are covered in the regulations listed above but other pertinent laws include the Fur Seal Act (Specific to northern fur seals *Callorhinus ursinus*) and the Lacey Act of 1901 which prohibits the importation, exportation, transportations, selling, receiving, acquiring or purchasing of any fish, wildlife or plant that has been taken or possessed in violation of any law, treaty, or regulation of the US or in violation of any Indian tribal Law.

Laws:

1. Marine Mammal Protection Act (MMPA)

    All pinnipeds and cetaceans are protected under the MMPA; some of which are “depleted”. Species determined to be “threatened” or “endangered “get further protection under the Endangered Species Act (ESA). Passed by Congress in 1972 to protect wild marine mammals and their habitats, The Act established a moratorium on the collection or importation of marine mammals with few exceptions. One of those exceptions is for the public display of marine mammals,

which Congress acknowledged as essential to their conservation. The Act was last amended in 1994. The MMPA also established the independent Marine Mammal Commission (MMC) to review and make recommendations on government policies and actions related to the implementation of the MMPA and to coordinate them to assure the best management practices for marine mammals. The Commission also reviews all applications for permits for scientific research, public display, or enhancing the survival or recovery of a species or stock.

The U.S. Department of Commerce's National Marine Fisheries Service (NMFS) and Department of Interior's U.S. Fish and Wildlife Service (FWS) implement regulations to carry out the mandates in the MMPA.

2. Endangered Species Act (ESA)

   Identifies species that are endangered or threatened, and designates critical habitat for listed species. The ESA prohibits taking, importing, exporting, selling, transporting, or possessing any illegally acquired species listed as endangered, subject to certain exceptions. One exception allows for the issuance of permits for scientific research or species enhancement. The ESA implements Convention of International Trade in Endangered Species of Wild Fauna and Flora (CITES) in the United States. The list of species regulated under CITES and regulations applicable to these listed animals can be found in **50 *CFR* Part 23.** The U.S. Department of Commerce's National Marine Fisheries Service (NMFS) and Department of Interior's U.S. Fish and Wildlife Service (FWS) implement regulations to carry out the mandates in the ESA.

3. Animal Welfare Act (AWA)

   Enacted in 1966, the AWA is designed to ensure humane handling, care, treatment and transportation of all warm-blooded animals. The Act was amended in 1979 to include marine mammals in public display facilities. Regulations under the AWA specific to marine mammals can be found in 9 *CFR* Chapter 1, Subchapter A, Part 3, Subpart E. The Department of Agriculture's Animal and Plant Health Inspection Service (APHIS) implements the mandates of the AWA.

Permitting

NMFS and FWS are responsible for issuing MMPA and ESA permits for their respective species. Permits are required to collect marine mammals from the wild, release marine mammals to the wild, and import live marine mammals. All MMPA permit applications are reviewed by the Marine Mammal Commission and its Committee of Scientific Advisors on Marine Mammals.

Under the MMPA, a permit is no longer required to hold marine mammals for public display; however, facilities exhibiting marine mammals must:

- Be open to the public on a regularly scheduled basis with access not limited or restricted other than by charging an admission fee
- Offer a program of education or conservation based on professionally recognized standards of the public display community (standards endorsed by the Association of Zoos and Aquariums and the Alliance of Marine Mammal Parks and Aquariums)
- Be registered or hold a license issued by APHIS.

Under the MMPA, a permit is **not** required for the export of marine mammals from U.S. public display facilities for display in a foreign zoo or aquarium. The receiving facility must meet all the requirements of public display as outlined by the AWA. The foreign receiving facility must submit sufficient government-certified documentation to APHIS to demonstrate comparability to U.S. regulations.

When transferring marine mammals between domestic institutions, no permit is required under the MMPA, but the facility must give NMFS or FWS a notice of transport at least 15 days prior to the move. The receiving institution must meet the three requirements for exhibiting marine mammals.

Letters of Authorization (LOA) from the appropriate agency are required to respond to, rescue, rehabilitate, and release stranded marine mammals. (16 *U.S.C.* 1379(h)). If an animal is determined to be non-releasable, the rehabilitating facility may request to retain the animal. If the facility cannot house the animal, NMFS makes the final determination regarding the placement of the animal. Federal regulations for rehabilitated marine mammals are found in **50 *CFR* 216.27** for NMFS and in **50 *CFR* 18.22** for FWS.

A CITES permit is required to import a CITES-listed marine mammal to the United States. Both an export permit and an import permit are required for international transport of marine mammals listed on CITES Appendix I. Only a CITES export permit is required for animals listed on CITES Appendix II. For species listed on CITES Appendix III, the country listing the species would have to issue an export permit when exporting the animal, whereas only a certificate of origin would be required for export by countries that did not list the species.

APPENDIX III - ***Marine Mammals Not Recommended for Captive Management***

The marine mammal species below are not considered suitable for long-term captive management due to their large size, lack of husbandry expertise and/or specialized food requirements.

Whales and Dolphins (Cetaceans)

Family	Scientific Name	Common Name
Balaenidae		
	Eubalaena australis	Southern right whale
	Eubalaena glacialis	North Atlantic right whale
	Eubalaena japonica	North Pacific right whale
	Balaena mysticetus	Bowhead whale
Neobalaenidae		
	Caperea marginata	Pygmy right whale
Eschrichtiidae		
	Eschrichtius robustus	Gray whale
Balaenopteridae		
	Balaenoptera bonaerensis	Antarctic minke whale
	Balaenoptera borealis	Sei whale
	Balaenoptera edeni	Bryde's whale
	Balaenoptera musculus	Blue whale
	Balaenoptera physalus	Fin whale
	Megaptera novaeangliae	Humpback whale
Physeteridae		
	Physeter macrocephalus	Sperm whale
Kogiidae		
	Kogia breviceps	Pygmy sperm whale
	Kogia sima	Dwarf sperm whale
Platanistidae		
	Platanista gangetica	South Asian river dolphin
Pontoporiidae		
	Pontoporia blainvillei	Franciscana
Lipotidae		
	Lipotes vexillifer	Baiji
Iniidae		

Monodontidae		
	Delphinapterus leucas	Cook Inlet beluga whale

Phocoenidae		

Delphinidae		
	Sousa teuszii	Atlantic humpback dolphin
	Lagenorhynchus albirostris	White-beaked dolphin
	Lagenorhynchus cruciger	Hourglass dolphin
	Lagenorhynchus australis	Peale's dolphin
	Grampus griseus	Risso's dolphin
	Lagenodelphis hosei	Fraser's dolphin
	Lissodelphis borealis	Northern right whale dolphin
	Lissodelphis peronii	Southern right whale dolphin
	Cephalorhynchus eutropia	Chilean dolphin
	Cephalorhynchus heavisidii	Heaviside's dolphin
	Cephalorhynchus hectori	Hector's dolphin
	Peponocephala electra	Melon-headed whale
	Feresa attenuata	Pygmy killer whale
	Globicephala melas	Long-finned pilot whale
	Orcaella brevirostris	Irrawaddy dolphin

Ziphiidae		
	Tasmacetus shepherdi	Shepherd's beaked whale
	Berardius bairdii	Baird's beaked whale
	Berardius arnuxii	Arnoux's beaked whale
	Mesoplodon pacificus	Longman's beaked whale
	Mesoplodon bidens	Sowerby's beaked whale
	Mesoplodon densirostris	Blainville's beaked whale
	Mesoplodon europaeus	Gervais' beaked whale
	Mesoplodon layardii	Strap-toothed whale
	Mesoplodon hectori	Hector's beaked whale
	Mesoplodon grayi	Gray's beaked whale
	Mesoplodon stejnegeri	Stejneger's beaked whale
	Mesoplodon bowdoini	Andrews' beaked whale
	Mesoplodon mirus	True's beaked whale
	Mesoplodon gingkodens	Ginkgo-toothed beaked whale
	Mesoplodon carlhubbsi	Hubbs' beaked whale
	Mesoplodon peruvianus	Pygmy beaked whale
	Mesoplodon bahamondi	Bahamonde's beaked whale
	Ziphius cavirostris	Cuvier's beaked whale
	Hyperoodon ampullatus	Northern bottlenose whale

	Hyperoodon planifrons	Southern bottlenose whale

Seals and Sea Lions (Pinnipeds)

Family	Scientific Name	Common Name
Phocidae		
	Phoca sibirica	Baikal seal or nerpa
	Phoca caspica	Caspian seal
	Ommatophoca rossii	Ross seal
	Mirounga leonina	Southern elephant seal
	Monachus monachus	Mediterranean monk seal
	Monachus tropicalis	Caribbean monk seal
Otariidae		
	Arctocephalus philippi	Juan Fernandez fur seal
	Arctocephalus pusillus	South African and Australian fur seals
	Arctocephalus forsteri	New Zealand fur seal
	Neophoca cinerea	Australian sea lion
	Phocarctos hookeri	New Zealand sea lion
Odobenidae		

Manatees, Dugongs, and Sea Cow (Sirenia)

Family	Scientific Name	Common Name
Trichechidae		
	Trichechus inunguis	Amazonian manatee
	Trichechus senegalensis	West African manatee
Dugongidae		
	Dugong dugon	Dugong
	Hydrodamalis gigas	Steller's sea cow

Otters (Carnivora)

Family	Scientific Name	Common Name
Mustelidae		
	Lutra felina	Marine otter

APPENDIX IV - ***Non-releasable Marine Mammals by Species/Year***

	2000	2001	2002	2003	2004	2005	2006	2007	Total
Cetaceans									
Atlantic bottlenose dolphin	4	0	2	2	2	3	3	1	17
Rough toothed dolphin	0	0	0	0	1	0	0	0	1
Atlantic spotted dolphin	0	0	0	0	1	0	0	0	1
Pan-tropical spotted dolphin	0	0	0	1	0	0	0	0	1
Spinner dolphin	0	0	1	0	3	2	0	1	7
Common dolphin	1	0	0	0	0	0	0	0	1
Harbor porpoise	0	0	1	0	0	0	0	0	1
Short finned pilot whale	0	1	0	0	0	0	0	0	1
Pinnipeds									
California sea lion	0	1	8	8	5	5	3	2	32
South American sea lion	0	0	0	0	0	0	1	0	1
Stellar sea lion	0	0	0	0	0	0	0	1	1
Atlantic harbor seal	1	0	1	2	1	1	2	1	9
Pacific harbor seal	1	0	0	0	0	1	2	1	5
Grey seal	0	1	0	0	0	1	0	1	3
Harp seal	0	0	0	0	1	0	0	1	2
Hooded seal	0	0	0	1	0	0	0	1	2
Northern elephant seal	0	0	1	0	0	0	0	1	2
Guadalupe fur seal	0	1	0	0	0	0	0	1	2

Reference: NMFS Marine Mammal Inventory Report

APPENDIX V – *List of References to Marine Mammal Information*

Alliance for Marine Mammal Parks and Aquariums www.ammpa.org
American Association of Zoo Veterinarians www.aazv.org
American Veterinary Medical Association (AVMA) www.avma.org
Animal Behavior Management Alliance www.theabma.org
Animal Rights International (AWI) www.awionline.org
Animal Training and Animal Enrichment (Disney Animal Kingdom) www.animaltraining.org
www.animalenrichment.org
Association of Fish and Wildlife Agencies www.fishwildlife.org
Association of Zoos and Aquariums http://www.aza.org
Coral Reef Alliance (CORAL) www.coral.org
Defenders of Wildlife www.defenders.org
European Association of Zoos and Aquariums http://www.eaza.net/
Fort Worth Zoo Enrichment Online http://www.enrichmentonline.org/browse/index.asp
International Congress of Zookeepers http://www.iczoo.org
International Marine Mammal Trainers Association http://www.imata.org
Ocean Alliance www.oceanalliance.org
Ocean Conservancy www.oceanconservancy.org
Seal Conservation Society http://www.pinnipeds.org/
Shape of Enrichment http://www.enrichment.org/
The Nature Conservancy www.nature.org
The Ocean Project www.theoceanproject.org
The Society for Marine Mammalogy http://www.marinemammalogy.org/
US Department of Agriculture/ Animal Health Inspection Service (USDA/APHIS) http://www.aphis.usda.gov/ac/
Whale and Dolphin Conservation Society (WDCS) www.wdcs.org
Whale Conservation Institute www.oceanalliance.org/wci

APPENDIX VI

Target Population Size Evaluations for the Marine Mammals Taxon Advisory Group

PMC/SPMAG ADVISORS
Sarah Long, AZA Population Management Center
Kristine Schad, AZA Population Management Center
12 August 2008

This report was prepared with assistance from the

PMC Population Management Center

Lincoln Park Zoo ASSOCIATION OF ZOOS & AQUARIUMS

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Acknowledgments

This report details the results of a meeting held at the Lincoln Park Zoo in Chicago, Illinois on 29 – 30 July 2008. In attendance were:

Jim Robinett, Shedd Aquarium
Gayle Sirpenski, Mystic Aquarium & Institute for Exploration
Rita Stacey, Chicago Zoological Society/Brookfield Zoo
Lisa Takaki, Shedd Aquarium
Kevin Willis, Minnesota Zoo
Sarah Long, Senior Population Biologist, AZA Population Management Center
Kristine Schad, Associate Population Biologist, AZA Population Management Center
Kristin Kovar, Studbook Analyst, AZA Population Management Center

Executive Summary

Objective: To assist the Marine Mammal Taxon Advisory Group with the evaluation of target population sizes in the current draft of the Marine Mammal TAG's Regional Collection Plan.

Methods: To evaluate potential management strategies for species that are current or proposed Population Management Plan species (PMPs) or Species Survival Plans® (SSPs), demographic and genetic analyses were conducted using the most current available studbook data and the Goal Setting screen of Population Management 2000 software (PM2000 Version 1.212). The current population size and baseline genetic analyses for each species was obtained from the population studbook or ISIS data as noted, for AZA institutions only unless otherwise stated. In additional modeling scenarios, adjustments to other demographic parameters such growth rate were made based on studbook data of the species in questions, similar species, or the expertise of meeting attendants.

Where noted, the number of founders that could reasonably be obtained was added into the projections to determine the impact on the maintenance of gene diversity. A potential founder is considered to be any animal that is unrelated to individuals in the current population, and may be obtained from other managed populations or from the wild. Although the importation of founders is considered in some of the management strategies evaluated and zoos and aquariums may serve a valuable role in the rescue and rehabilitation of injured, stranded, or orphaned marine mammals, frequent importations should not necessarily be viewed as an alternative strategy to responsible population management for the maintenance of gene diversity over time.

Management Goals: For each species, several different strategies were tested to evaluate population sizes relative to genetic and demographic sustainability over the next 100 years. The first strategy listed in the table for each species is a baseline strategy, demonstrating the projected status of the population assuming no changes to current management or population parameters and using either the population's current size or the estimated current maximum holding capacity from the TAG's 2007 space survey. Other strategies tested include changes to population parameters, including growth rate and effective population size, or the recruitment or acquisition of potential founders.

The target size analyses within this document are based primarily on genetic projections, with the assumption that husbandry and cooperation will be adequate for the populations to grow to the target sizes tested. The genetic goal for all populations was the maintenance of 90% gene diversity for 100 years into the future or, if starting gene diversity was unknown or already lower than 90%, long-term management goals are assumed to be the loss of no more than 10% gene diversity relative to the starting gene diversity. When gene diversity falls below approximately 90% of the gene diversity in the founding population, it is expected that reproduction will be increasingly compromised by, among other factors, smaller clutch sizes, lower hatch weights, and greater infant mortality.

Definitions and Explanation of Tables

Demography & Genetics

Number of holding institutions	N_0	Estimated future holding capacity	T	λ	GD_0	N_e/N	% pedigree known before assumptions	% pedigree known after assumptions

Number of institutions
This is the number of AZA institutions currently holding specimens of a given species, unless otherwise specified.

N_0 – Current population size
This is the current number of specimens estimated to be living in participating institutions, according to the most current studbook.

Estimated holding capacity
This is the estimated current maximum population size compiled from the 2007 TAG space survey sent to institutions.

T – Generation time
This represents the average age at reproduction (from first reproduction through to last reproduction), in years.

λ - Potential population growth rate (λ = 1.0, 0% growth)
This represents the annual rate of increase of the population, as determined by demographic analysis of historic studbook data within the date range of modern management, or comparison with a similar species.

GD_0 – Estimated current gene diversity of AZA population (%)
Gene diversity was calculated by genetic analysis of true or analytical studbook data. When studbook data was insufficient, a benchmark gene diversity (90%) was used as a starting point to measure loss of GD over time. The proportional gene diversity (as a proportion of the source population) is the probability that two alleles from the same locus sampled at random from the population will not be identical by descent.

N_e/N – Ratio of effective population size to actual population size.
This ratio represents the approximate proportion of the population that is breeding, calculated from the number of living animals with living offspring in the population.

% Known – Percentage of pedigree known (before and after assumptions and exclusions).
This is the proportion of the pedigree of living specimens descended from known or wild-caught ancestors. If pedigree assumptions were made or if unknown pedigree animals were excluded from the genetic analyses, the percentage known before and after these assumptions/exclusions is noted.

The following table is an example of different projection strategies used for each population to evaluate whether the current population will be able to meet the standard AZA program goal of 90% gene diversity for at least 100 years.

Projection strategy	% GD at 100 years	Years to 90% GD	Years to 10% GD loss	Tested Target Population Size
A. Baseline				
Strategy A evaluates the genetic status of the population in 100 years under current conditions (historic average annual growth rate, current GD, current Ne/N). This strategy assumes that no founders will be imported. The **tested target population size** *was the number set as the maximum allowable population size on the PM2000 Goals Screen, and was generally the estimated current maximum holding capacity from the TAG's space survey.*				
B. Increase lambda or Ne/N C. Increase target population size tested				
Additional strategies evaluate the genetic status of the population in 100 years with an improvement to population parameters (average annual growth rate, Ne/N) or an increase in the tested target size (set to either the estimated future holding capacity from the TAG's space survey or some larger population size).				
D. Import reasonable # founders				
Other additional strategies evaluate the genetic status of the population based on previous improvements with the addition of a realistic number of founders, based on meeting attendees' expertise, with imports scheduled as described.				

California Sea Lion
Zalophus californianus

Proposed program status: PMP

Projections for this population were based on the analytical version of the Regional California Sea Lion Studbook (current to 18 July 2008, from Studbook Keeper Jennifer McGee, Chicago Zoological Society/Brookfield Zoo). Assumptions were developed for the April 2008 PMP Breeding and Transfer Plan. Genetic data exports were for the living AZA population excluding neutered and unknown pedigree animals. Demographic data was exported for AZA 1980 – present. However, some demographic data for this population is lacking. The California Sea Lion North American Regional Studbook includes only currently living animals and all of their ancestors (as per new WCMC guidelines). The studbook does not include most of the large number of historical records that have no known connection to the current population. Because of this method of studbook-keeping, the studbook cannot provide accurate information about mortality rates, effective population size, and growth rates. Therefore, these values were estimated based on data from the Marine Mammal Inventory and species biology (e.g., $Q_{x=1}$ = 0.30).

Demography & Genetics

	Number of holding institutions	N (M.F.U)	N after exclusions	5-year estimated holding capacity	T	Projected λ	GD (%)	N_e/N	% pedigree known before assumptions/ exclusions	% pedigree known after assumptions/ exclusions
AZA	45	313 (145.167.1)	131	361	12.7		98.21		51.3%	100%
Variables used in projections						1.03		0.20		

N – Current population size
Estimated holding capacity was based on the current maximum holding obtained from the Marine Mammal TAG's space survey.
T – Generation time (years) *(estimated)*
λ - Potential population growth rate (λ = 1.0, 0% growth) *(estimated)*
GD – Estimated current gene diversity of AZA population
N_e/N – Ratio of effective population size to actual population size *(estimated)*
% Known – proportion of descendant population with known pedigree.

Projection Strategy	% GD at 100 years	Years to 90% GD	Tested target population size	Minimum population size needed to meet genetic goals
A. Baseline	> 90%	> 100	361	250

Demographic summary: This population is has been sustained by both periodic imports of stranded or orphaned animals as well as by zoo & aquarium births. Demographic projections based on estimated birth and death rates indicate that approximately 30 – 35 births or imports per year would be necessary to increase the AZA population to the estimated 5 – year capacity of 361.

Genetic summary: This population is able to meet long-term genetic goals of 90% gene diversity for 100 years with the current target population size. In fact, because of the large number of founding animals (84 founders and 28 additional potential founders) and high starting gene diversity, this population would actually be able to meet genetic goals with a smaller target size (250).

The main focus of this population should be demographic, breeding animals (using mean kinship) and creating a self-sustaining population with a more stable age structure.

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California Sea Lion

Zalophus californianus

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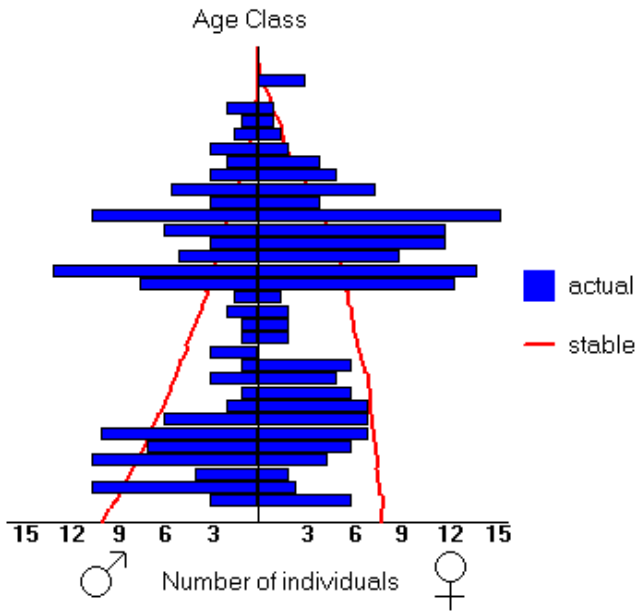

Figure 1. Age structure of the entire currently living population of California Sea Lions (N=313 (145.167.1)).

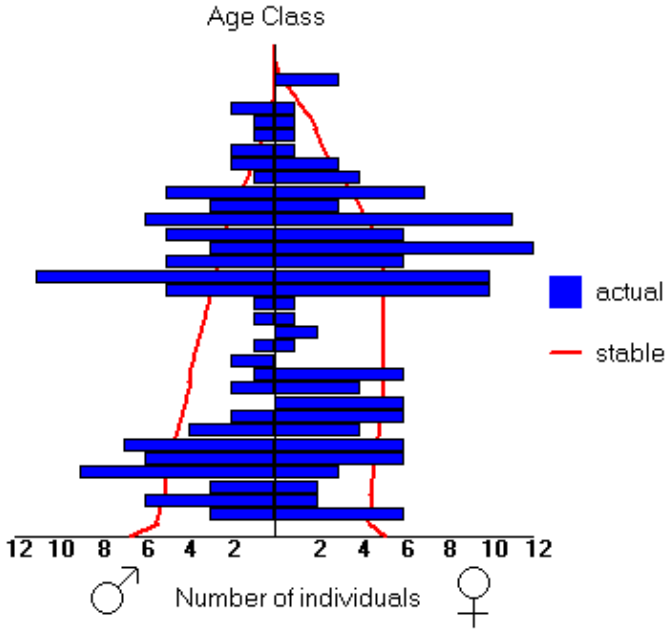

Figure 2. Age structure of the breeding population (N=131).

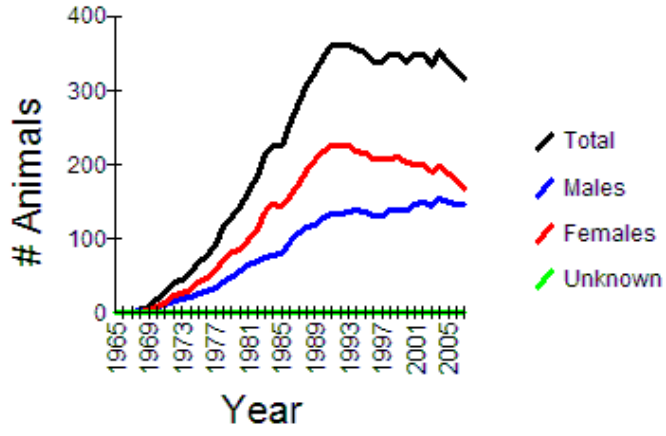

Figure 3. Census of population by sex of California sea lions.

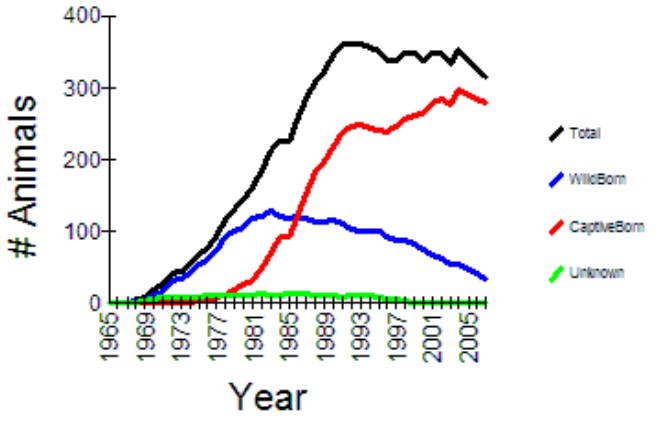

Figure 4. Census of population by birth type of California sea lions.

Steller Sea Lion
Eumetopias jubatus

Proposed program status: None → DERP

Projections for this population were based on the Steller Sea Lion studbook (current to 7 July 2008, maintained by Gayle Sirpenski, Mystic Aquarium). Genetic data exports for the living population were based the entire North American population (3 AZA institutions + Alaska SeaLife). Demographic exports were based on North American data from 1 January 1980 – 29 July 2008.

Demography & Genetics

	Number of holding institutions	N	N (after exclusions)	5-year estimated holding capacity	T	Projected λ	GD (%)	N_e/N	% pedigree known before assumptions/ exclusions	% pedigree known after assumptions/ exclusions
North America	4	22 (5.17.0)	19	21	--	--	72%	--	70%	83.3%

N – Current population size
Estimated holding capacity was based on the current maximum holding obtained from the Marine Mammal TAG's space survey.
T – Generation time (years)
λ - Potential population growth rate based on historic data for this species (λ = 1.0, 0% growth)
GD – Estimated current gene diversity of population
N_e/N – Ratio of effective population size to actual population size
% Known – proportion of descendant population with known pedigree

Demographic summary: This population is demographically unstable due to its small size and heavily female biased age structure. More breeding and additional males would be required to create a more stable population.

Genetic summary: The population is comprised of mostly potential founders (16) who have not yet bred, with a potential gene diversity of 97.22%. If these potential founders were to successfully breed, the population would have a good start towards becoming a genetically healthy zoo/aquarium population.

The TAG plans to keep this population as a DERP because of low institutional interest currently, permitting issues, low likelihood of breeding due to space and behavioral issues. However, we propose that the TAG set a short-term goal of increasing this population to 30 individuals and recruiting at least two additional institutions. If this population were to become a more intensively managed program (PMP or SSP), males would need to be added and the potential founders would need to be bred to start the population towards a more genetically and demographically health population.

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Steller Sea Lion
Eumetopias jubatus
(continued)

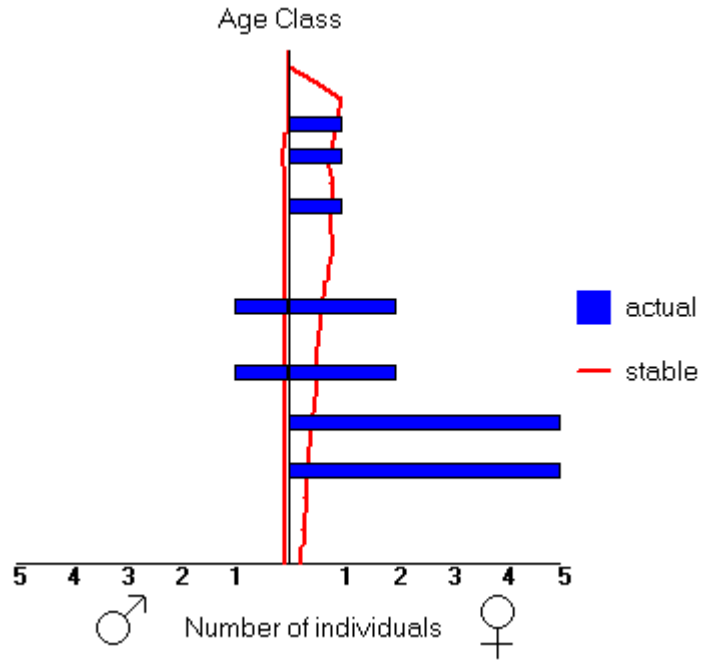

Figure 1. Age structure of the breeding population of Steller sea lions (5.17.0).

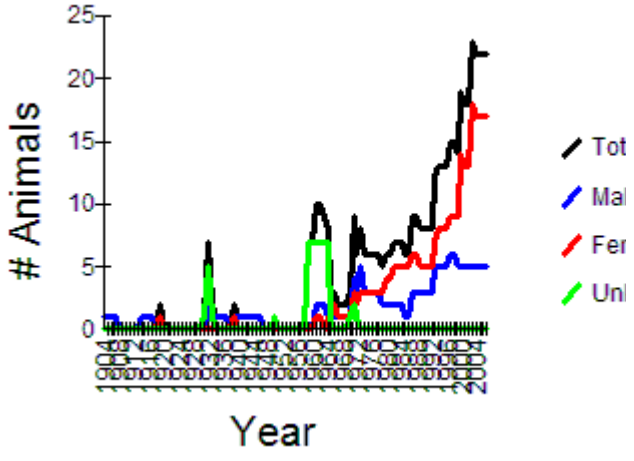

Figure 2. Census of population by sex of Steller sea lions.

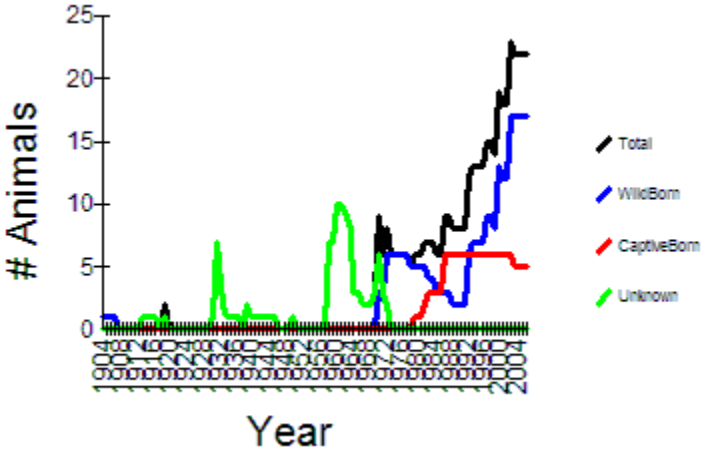

Figure 3. Census of population by birth type of Steller sea lions.

Northern Fur Seal
Callorhinus ursinus

Proposed program status: DERP → PMP

Projections for this population were based on the Northern fur seal studbook (current to 31 January 2008, maintained by Gayle Sirpenski at Mystic Aquarium). Genetic data exports for the living population were based on the AZA population. Demographic exports were based on data AZA from 1 January 1970 – 29 July 2008.

Demography & Genetics

	Number of holding institutions	N (M.F.U)	N (after exclusions)	5-year estimated holding capacity	T	Projected λ	GD (%)	N_e/N	% pedigree known before assumptions/exclusions	% pedigree known after assumptions/exclusions
AZA	5	16 (9.7.0)	13	32	11.1	0.909	90.45	0.1538	100%	100%
Variables used in projections						1.01		0.2		

N – Current population size
Estimated holding capacity was based on the 5-year estimated holding capacity from the Marine Mammal TAG's 2007 space survey.
T – Generation time (years)
λ - Estimated potential population growth rate (λ = 1.0, 0% growth)
GD – Estimated current gene diversity of AZA population
N_e/N – Ratio of effective population size to actual population size
% Known – proportion of descendant population with known pedigree

Projection strategy	% GD at 100 years	Years to 90% GD	Years to 10% GD loss	Tested target population size	Minimum population size needed to meet genetic goals*
A. Baseline (lambda = 1.01)	18%	Already < 90%	3	32	Not possible
B. Recruit additional founders (2 founders every 4 year for 100 years)	81%	Already < 90%	> 100	32	28
C. Recruit additional founders (2 founders every 10 year for 100 years)	73%	Already < 90%	4	32	Not possible
D. Recruit additional founders (2 founders every 10 year for 100 years) and **increase Ne/N to 0.20**	76%	Already < 90%	7	32	Not possible
E. Recruit additional founders (2 founders every 10 year for 100 years), Ne/N = 0.20, **increase Kt to 40**	78%	Already < 90%	7	40	59

***genetic goals: GD loss <= 10%**

Demographic summary: This population is currently declining. First–year mortality appears to be high (~63%) based on the small number of births recorded so far (< 40). Approximately 2-3 births or imports per year are necessary to keep the population at its current size.

Genetic summary: The current population is descended from 10 founders. There are currently no potential founders in the population. To better meet genetic goals, the population should recruit additional founders to increase genetic diversity and focus on breeding animals using mean kinship, unless the population can rely on a steady influx of additional stranded or orphaned animals.

Northern Fur Seal

Callorhinus ursinus

(continued)

With additional founders and a focus on breeding, this population would benefit from additional space and be able to meet genetic goals of a less than 10% loss of gene diversity over 100 years.

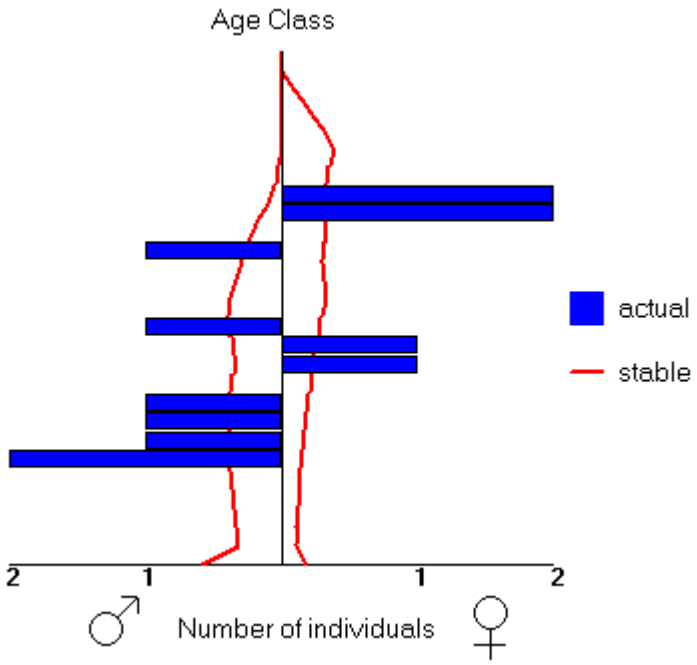

Figure 1. Age structure of the breeding population of Northern fur seals (7.6.0).

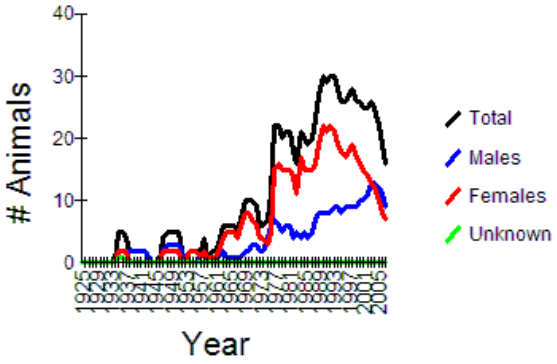

Figure 2. Census of population by sex

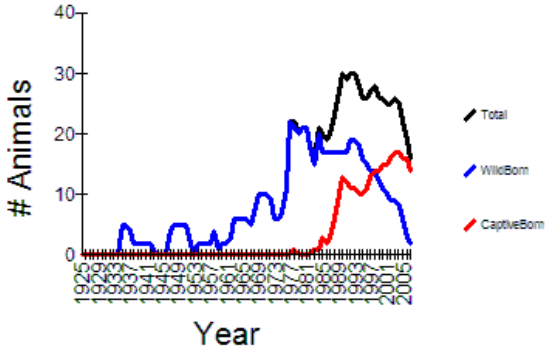

Figure 3. Census of population by birth type of Northern fur seals.

Gray Seal
Halichoerus grypus

Proposed program status: None → PMP

Projections for the gray seal population were based on the gray seal studbook (current to 25 May 2008, maintained by Rita Stacey, Chicago Zoological Society/Brookfield Zoo). Genetic data exports for the living population were based on the AZA population. One assumption was made for an animal with multiple potential sires and some older and neutered animals were excluded.

Demographic data was exported for AZA 1970 – present. However, some demographic data for this population is lacking. This database includes only currently living animals and all of their ancestors (as per new WCMC guidelines for studbooks); the studbook does not include most of the large number of historical records that have no known connection to the current population. Because of this method of studbook-keeping, the studbook cannot provide accurate information about mortality rates, effective population size, and growth rates. Therefore, these values were estimated based on data from a similar species (harbor seal) from the Marine Mammal Inventory and general species biology (e.g., Qx = 0.30).

Demography & Genetics

	Number of holding institutions	N	N (after exclusions)	5-year estimated holding capacity	T	λ	GD (%)	N_e/N	% pedigree known before assumptions/ exclusions	% pedigree known after assumptions/ exclusions
AZA	11	25 (10.15.0)	22	30	16.2	0.96	88.62	0.40	89.6%	100%
Variables used in projections						1.03	92	0.30		

N – Current population size
Estimated holding capacity was based on the 5-year estimated holding capacity from the Marine Mammal TAG's 2007 space survey.
T – Generation time (years)
λ - Potential population growth rate based on historic data for this species (λ = 1.0, 0% growth) *(estimated)*
GD – Estimated current gene diversity of AZA population
N_e/N – Ratio of effective population size to actual population size. *(a more realistic Ne/N was used for long-term projections)*
% Known – proportion of descendant population with known pedigree.

Projection strategy	% GD at 100 years	Years to 90% GD	Years to 10% GD loss	Tested target population size	Minimum population size needed to meet genetic goals
A. Baseline (lambda = 1.03, Ne/N = 0.30)	62%	Already < 90%	33	30	Not possible
B. Incorporate existing potential founders into starting GD = 92%	64%	3	29	30	Not possible
C. Incorporate existing potential founders into starting GD = 92% & add new potential founders (1 every 5 years)	82%	5 years	> 100 years	30	29
D. Incorporate existing potential founders into starting GD = 92% & add new potential founders (1 every 5 years) & increase target size to 40	84%	5 years	> 100 years	40	29
E. Incorporate existing potential founders into starting GD = 92% & add new potential founders (1 every 5 years) & increase target size to 60	87%	5 years	> 100 years	60	29

[Continued on following page]

Grey Seal
Halichoerus grypus
(continued)

Demographic summary: Based on the modified demographic data, at least 3 births or imports are necessary to maintain the population at its current size. Approximately 7 births or imports would be needed to increase to the proposed target size.

Genetic summary: There are currently 8 potential founders (1.7) in the AZA population already – recruiting at least half of these animals would increase the gene diversity to approximately 92%. Projections indicate if existing potential founders already in the population can be bred and if there is a periodic influx of additional founders coming in from the wild, increasing the target size to 40 or 60 would not significantly improve the genetic outlook for this species (Scenario D & E).

The TAG could consider either a) managing gray seals at a target size of 30 with a reliance on imports or b) obtain additional spaces from a more stable seal population (e.g., harbor seals) to increase the target size above 40 and allow for a more self-sustaining breeding gray seal population.

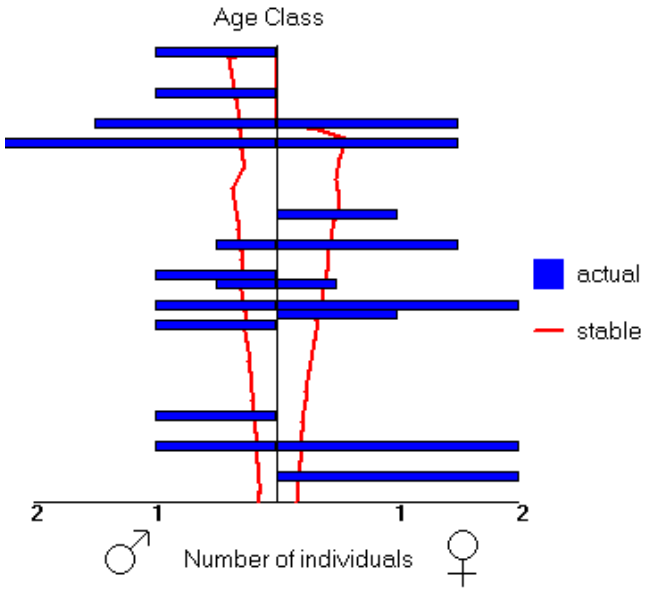

Figure 1. Age structure of the breeding population of grey seals (12.13.0).

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Grey Seal

Halichoerus grypus

(continued)

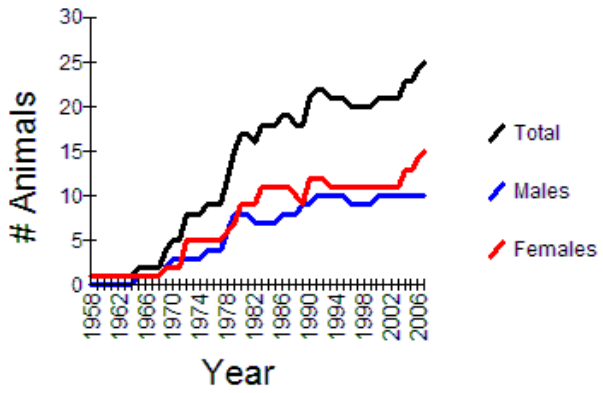

Figure 2. Census of population by sex of grey seals.

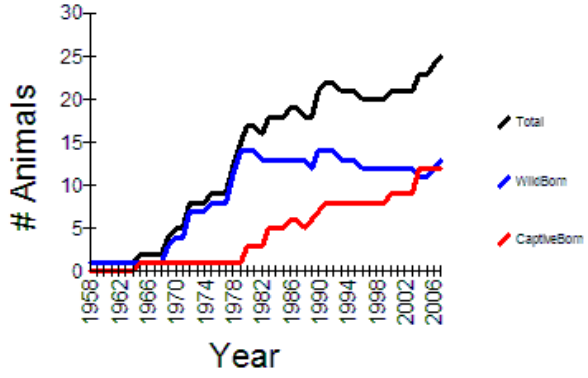

Figure 3. Census of population by birth type of grey seals.

Harbor Seal
Phoca vitulina

Proposed program status: None → PMP

Projections for the AZA harbor seal population were based on analyses from the harbor seal studbook (current to 10 July 2008, maintained by Megan Wright, Blank Park Zoo). Genetic data exports for the living population were based on the North America population. However, only 35% of the population pedigree traces back to known wild ancestors, so genetic analyses are an estimate based only on this small fraction and in reality may be significantly higher or lower. Some older animals were excluded from the genetic analyses.

Demographic exports were based on AZA data from 1 January 1980 – 29 July 2008. However, some demographic data for this population is lacking. According to new WCMC guidelines for studbooks, this database includes only currently living animals and all of their ancestors; the studbook does not include most of the large number of historical records that have no known connection to the current population. Because of this method of studbook-keeping, the studbook cannot provide accurate information about mortality rates, effective population size, and growth rates. Therefore, these values were estimated based on data from the Marine Mammal Inventory and general species biology (e.g., Qx = 0.30).

Demography & Genetics

	Number of holding institutions	N	N (after exclusions)	5-year estimated holding capacity	T	λ	GD (%)*	N_e/N	% pedigree known before assumptions/ exclusions	% pedigree known after assumptions/ exclusions
AZA	35	163 (74.84.5)	159	187	15.3	0.971	96.8	0.1578	34%	34.7%
Values used for projections						1.01		0.20		

N – Current population size
Estimated holding capacity was based on the 5-year estimated holding capacity from the Marine Mammal TAG's 2007 space survey.
T – Generation time (years)
λ - Potential population growth rate based on historic data in Marine Mammal Inventory for this species (λ = 1.0, 0% growth)
GD – *Estimated current gene diversity of AZA population based on the known portion of the population that traces back to the wild; based on life table data from the Marine Mammal Inventory, which increases the mortality rate but does not change the fecundity rates
N_e/N – Ratio of effective population size to actual population size.
% Known – proportion of descendant population with known pedigree.

Projection strategy	% GD at 100 years	Years to 90% GD	Tested target population size	Minimum population size needed to meet genetic goals
A. Baseline (lambda = 1.00, Ne/N = 0.15)	84%	51	159	Not possible
B. Increase growth rate to 1.01 and increase Ne/N to 0.20	87%	69	159	262
C. Increase growth rate to 1.01 and increase Ne/N to 0.20 and increase target size to 187	89%	80	187	262
D. Increase growth rate to 1.01 and increase Ne/N to 0.20 and increase target size to 187, add 1 founder every other year	> 90%	> 100	187	72

[Continued on following page]

Harbor Seal
Phoca vitulina
(continued)

Demographic summary: This population has been increasing due primarily to zoo & aquarium births. Approximately 13 births or imports per year are necessary to keep the population at its current size (lambda = 1.00). Approximately 19 births or imports per year are necessary to grow the population to the target size of 187 (lambda = 1.0279).

Genetic summary: Even with unknown pedigree issues, this population's genetic outlook is projected to be very optimistic, with a large founder base (32 founders and 39 additional potential founders) and the possibility of regular imports from the wild (historically, frequent stranded animals) (Scenario D).

The studbook keeper should continue to work with historic and current holding institutions to resolve unknown pedigrees in this population. This population has been breeding fairly well and with good genetic management, it can most likely meet genetic goals with either the current or 5-year projected population sizes (159, 187). Additional space would not significantly improve the outlook for this species and some space used for harbor seals could be allocated for a species in greater need.

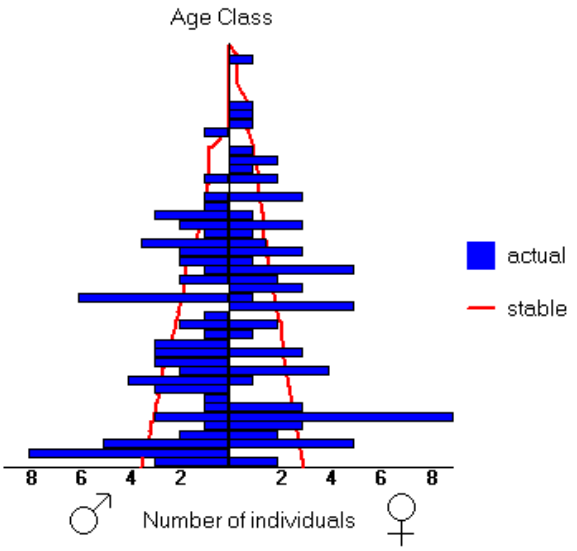

Figure 1. Age structure of the breeding population of harbor seals (N=159).

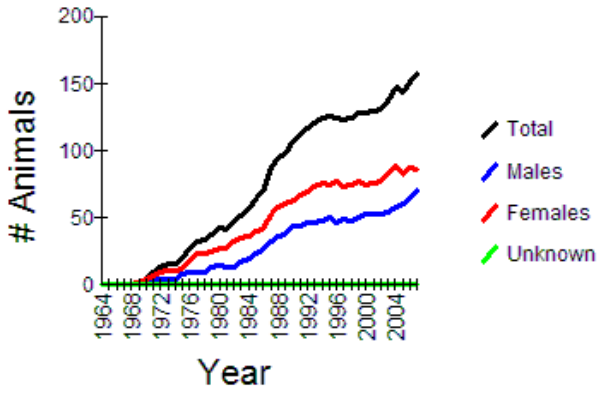

Figure 2. Census of population by sex of harbor seals.

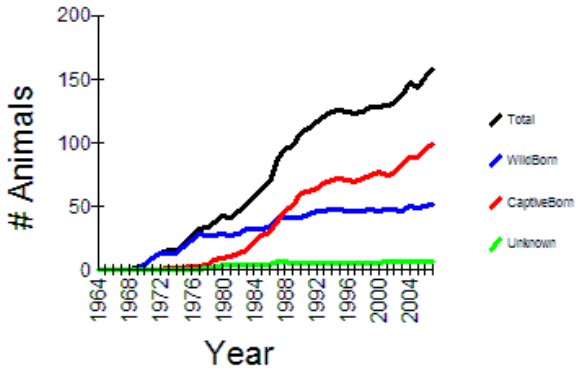

Figure 3. Census of population by birth type of harbor seals.

Pacific Walrus
Odobenus rosmarus

Proposed program status: PMP

Projections for the AZA walrus population were based on the North American Regional Walrus Studbook (current to 25 July 2008, maintained by Studbook Keeper Lisa Oland, Indianapolis Zoo). Genetic data exports for the living population were based on the AZA population. Demographic exports were based on AZA data from 1 January 1970 – 30 July 2008.

Demography & Genetics

	Number of holding institutions	N	N (after exclusions)	5-year estimated holding capacity	T	λ	GD (%)	N_e/N	% pedigree known before assumptions/ exclusions	% pedigree known after assumptions/ exclusions
AZA	7	22 (10.12)	22	38	--	--	83.33	--	75%	75%

N – Current population size
Estimated current holding capacity was obtained from the Marine Mammal TAG's space survey
T – Generation time (years)
λ - Potential population growth rate based on historic data for this species (λ = 1.0, 0% growth)
GD – Estimated current gene diversity of AZA population
N_e/N – Ratio of effective population size to actual population size
% Known – proportion of descendant population with known pedigree

Demographic summary: Demographic data is based on very small sample sizes due to the historically small population size and very few births (12) and deaths in the database. Male infant mortality is 39% (N = 16), female is 28% (N = 23). According the database, females have bred at ages 10 – 27; males have bred at ages 13 – 28. Records indicate that the oldest male is 31 (currently alive now) and the oldest female lived to age 33.

Genetic summary: This population is comprised of eighteen wild born individuals and four animals born in zoos/aquariums (descended from 6 known founders). Fourteen potential founders remain (potential GD = 97.37). Genetic projections were not conducted for this population as it is not intended to be a breeding population managed by zoo/aquariums.

This species and the individuals at AZA institutions fall under the jurisdiction of the U.S. Fish & Wildlife Service (USFWS).

Pacific Walrus
Odobenus rosmarus
(continued)

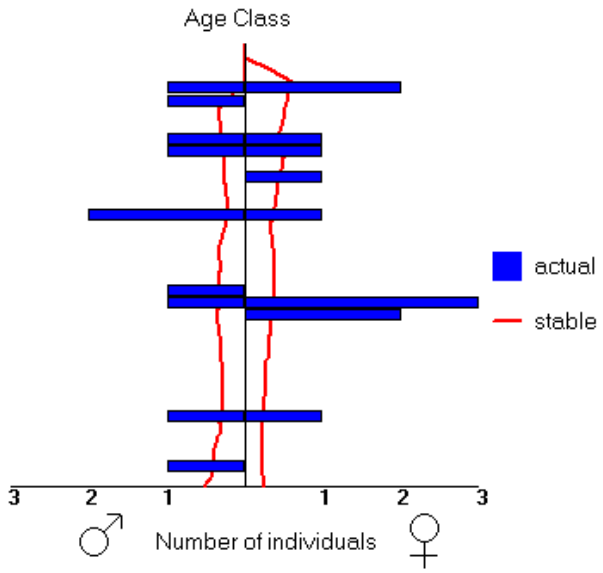

Figure 1. Age structure of the breeding population of walrus (10.12.0).

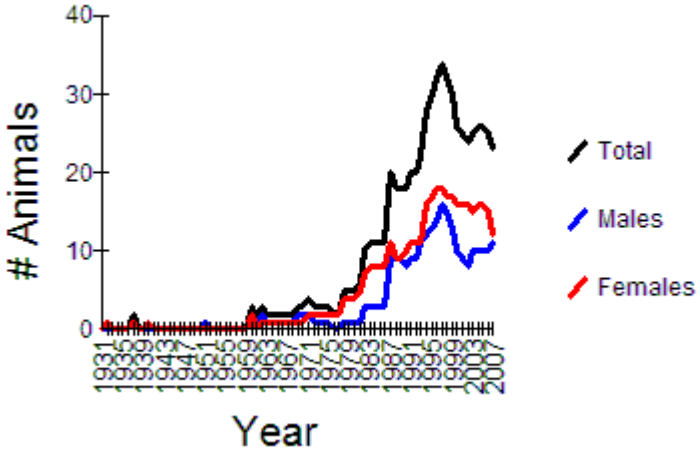

Figure 2. Census of population by sex of walrus.

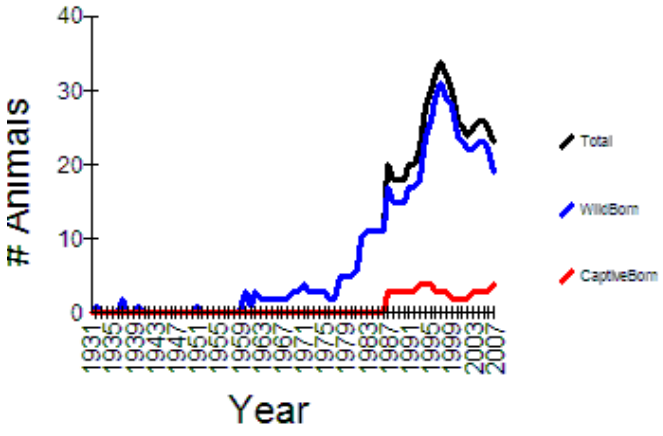

Figure 3. Census of population by birth type of walrus.

Beluga Whale
Delphinapterus leucas

Proposed program status: PMP → SSP

Projections for AZA beluga whale population were based on a North American Regional Beluga Whale studbook (current to 1 June 2008, maintained by Studbook Keeper Derek Woodie, Point Defiance Zoo). The TAG plans to upgrade this program to an SSP. Genetic data exports for the living population were based on the AZA population. Demographic exports were based on AZA data from 1 January 1970 – 30 July 2008. Assumptions were developed by the PMC during the TAG meeting to complete parentage for several offspring with multiple potential sires.

Demography & Genetics

	Number of holding institutions	N	N (after exclusions)	5-year estimated holding capacity	T	λ	GD (%)	N_e/N	% pedigree known before assumptions/ exclusions	% pedigree known after assumptions/ exclusions
AZA	8	36 (14.22)	36	50	22.3	0.93	95.21	0.2963	87.5%	100%
Values used for projections					15	1.03				

N – Current population size
Estimated current holding capacity was obtained from the Marine Mammal TAG's 2007 space survey
T – Generation time (years)
λ - Potential population growth rate based on historic data for this species (λ = 1.0, 0% growth)
GD – Estimated current gene diversity of AZA population
N_e/N – Ratio of effective population size to actual population size.
% Known – proportion of descendant population with known pedigree.

Projection strategy	% GD at 100 years	Years to 90% GD	Years to 10% GD loss	Tested target population size	Minimum population size needed to meet genetic goals
A. Baseline (lambda = 1.03, Ne/N = 0.29, T = 15)	75%	20	45	50	Not possible
B. Add additional founders (2 founders every 10 years)	86%	26	> 100 years	50	108

Demographic summary: Demographic projections indicate that at least 4 births are required to offset deaths and maintain the population at its current size. Projections indicate that 6 births are necessary to grow the population to 50 animals in 10 years. Demographic analyses based on the historic studbook data indicate average first year mortality rates are 40% (N = 35). However, anecdotal evidence indicates first-year mortality rates may be closer to 66% and therefore the number of births required to meet demographic goals should be considered a minimum number.

Genetic summary: Genetic projections indicate that this population could most likely reach genetic goals with careful genetic management and the addition of potential founders periodically (Scenario B). However, meeting genetic goals will require resolving demographic problems and obtaining a positive growth rate.

The main focus of this program should be on demographic issues rather than genetic goals. This program should breed as many individuals as possible and minimize first-year mortality in order to attempt to maintain the current population size and demographic stability.

Beluga Whale

Delphinapterus leucas

(continued)

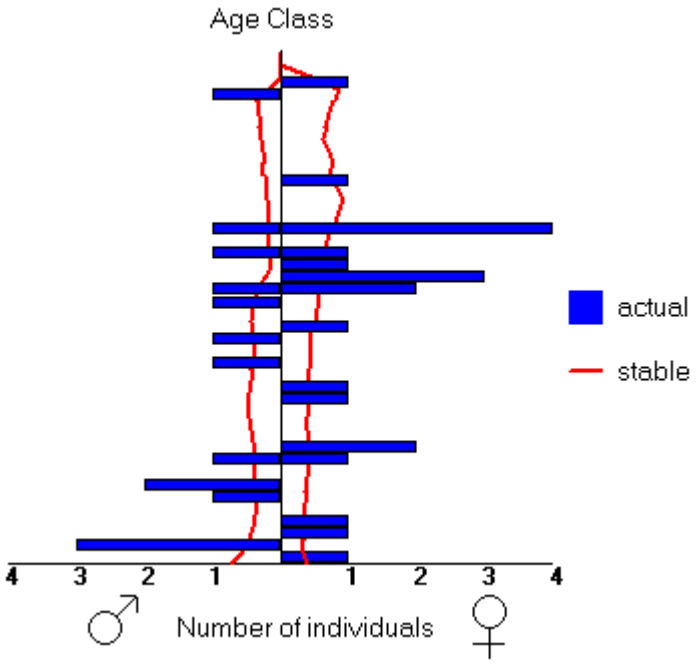

Figure 1. Age structure of the breeding population of beluga whales (14.22.0).

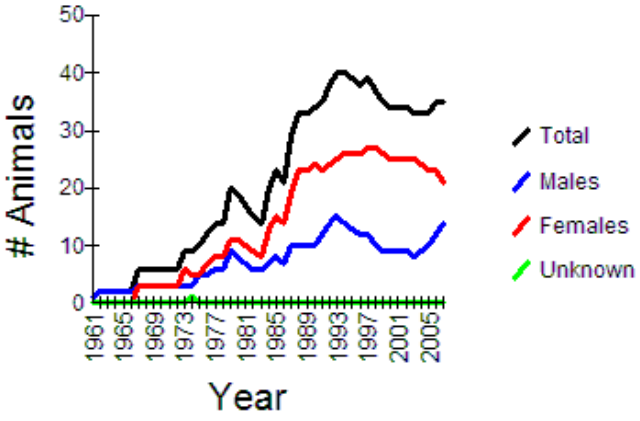

Figure 2. Census of population by sex of beluga whales.

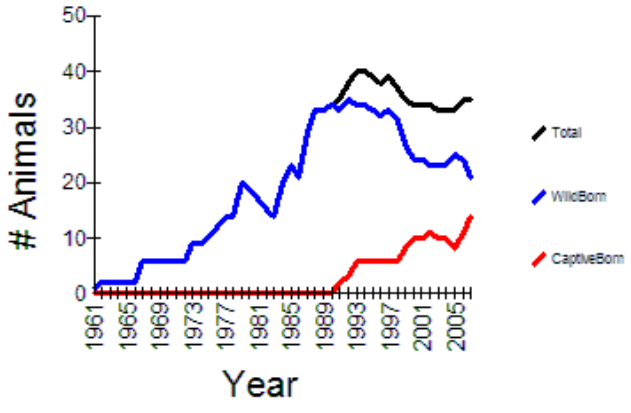

Figure 3. Census of population by birth type of beluga whales.

Bottlenose Dolphin
Tursiops truncatus

Proposed program status: PMP

Projections for AZA bottlenose dolphin population were based on a North American Regional Beluga Whale studbook (current to 24 July 2008, maintained by Studbook Keeper Marilyn Dudley, Sea World San Diego). Genetic data exports for the living population were based on the AZA population; no assumptions were made for the few unknown parentage animals in the living population. Demographic exports were based on AZA data from 1 January 1990 – 30 July 2008 (1990 being the date threshold from which institutions were requested to submit more complete historic data for the studbook).

Demography & Genetics

	Number of holding institutions	N	N (after exclusions)	5-year estimated holding capacity	T	λ	GD (%)	N_e/N	% pedigree known before assumptions/ exclusions	% pedigree known after assumptions/ exclusions
AZA	9	210 (91.116.3)	210	179	19.2	1.013	98.73	0.3220	90.9%	90.9%

N – Current population size
Estimated current holding capacity was obtained from the Marine Mammal TAG's 2007 space survey
T – Generation time (years)
λ - Potential population growth rate based on historic data for this species (λ = 1.0, 0% growth)
GD – Estimated current gene diversity of AZA population
N_e/N – Ratio of effective population size to actual population size
% Known – proportion of descendant population with known pedigree

Projection strategy	% GD at 100 years	Years to 90% GD	Tested target population size	Minimum population size needed to meet genetic goals
A. Baseline	> 90%	> 100	210	89

Demographic summary: Approximately 13 births per year are required to offset deaths and keep this population at its current size. Historically, this population exceeded this number of births and has been growing at an average rate of about 1% (lambda =1.013).

Genetic summary: Due to the large founder base (94 founders), healthy effective population size, and a positive growth rate, the AZA population of bottlenose dolphins can meet genetic goals with the current population size of 210. In fact, this population could meet genetic goals with a population size as low as 89. The genetic outlook is further enhanced by 15 additional founders currently in the population and the possibility of small numbers of new founders added periodically.

With few species competing for *Tursiops* space and a current population size well above the size necessary to meet genetic goals, the target size for this species can be based on institutional demand rather than population management goals.

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Bottlenose Dolphin

Tursiops truncatus

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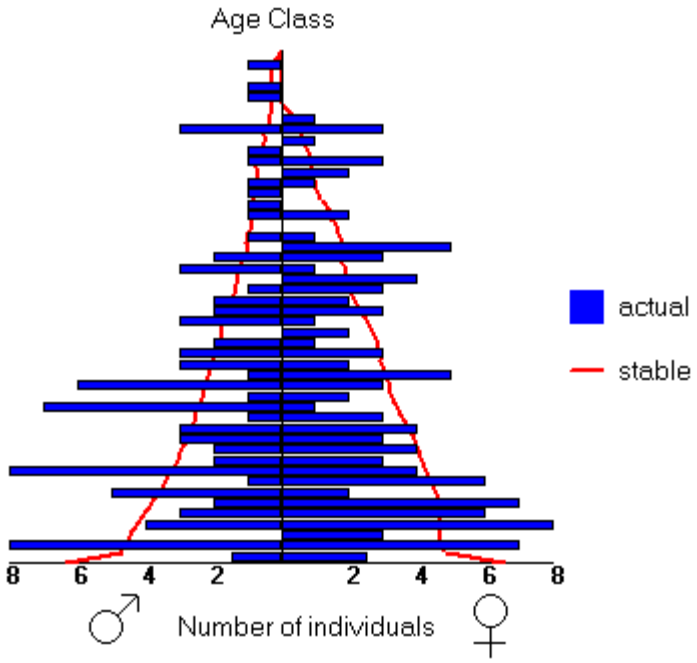

Figure 1. Age structure of the breeding population of bottlenose dolphins (N=210 (91.116.3)).

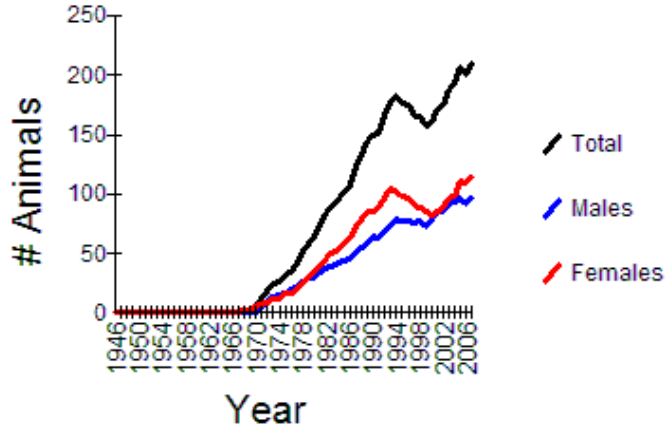

Figure 2. Census of population by sex of bottlenose dolphins.

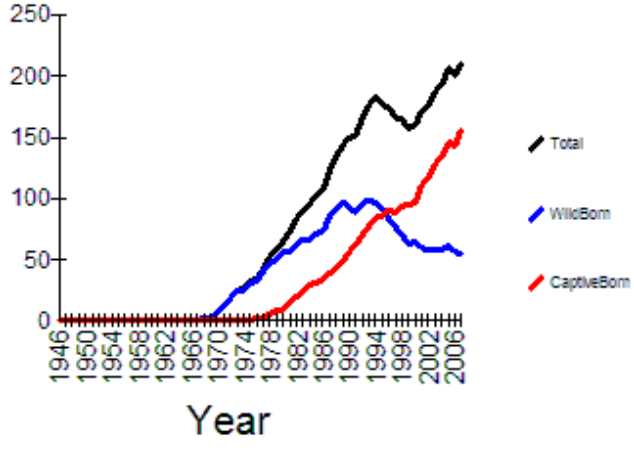

Figure 3. Census of population by birth type of bottlenose dolphins.

Pacific White-sided Dolphin
Lagenorhynchus obliquidens

Proposed program status: DERP

Projections for AZA bottlenose dolphin population were based on the North American Regional Pacific White-sided Dolphin studbook (current to 24 June 2008, maintained by Lisa Takaki, John G. Shedd Aquarium). Genetic data exports for the living population were based on the AZA population. Demographic and genetic data is lacking for this species due to the small population size and few births. Demographic values were estimated based on the biology of bottlenose dolphins and the expertise of meeting attendees. Theoretical genetic values were calculated from the number of potential founders in the population.

Demography & Genetics

	Number of holding institutions	N	N (after exclusions)	5-Year estimated holding capacity	T	λ	GD (%)	N_e/N	% pedigree known before assumptions/ exclusions	% pedigree known after assumptions/ exclusions
AZA	3	16 (2.13.1)	--	22	--	--	--	--	--	--
Values used for projections					18	1.03	95	0.32		

N – Current population size
Estimated current holding capacity was obtained from the Marine Mammal TAG's 2007 space survey
T – Generation time (years) *(estimated)*
λ - Potential population growth rate based on historic data for this species (λ = 1.0, 0% growth) *(estimated)*
GD – Estimated current gene diversity of AZA population
N_e/N – Ratio of effective population size to actual population size (*estimated)*
% Known – proportion of descendant population with known pedigree

Projection strategy	% GD at 100 years	Years to 90% GD	Years to 10% GD loss	Tested target population size	Minimum population size needed to meet genetic goals
A. Baseline	62	10	23	22	Not possible

Demographic summary: This population has several demographic challenges common to small, fairly young populations. The age structure of this population is unstable--heavily female-biased with too few juveniles to support future reproduction.

Genetic summary: Some recent breeding has occurred but parentage of these six animals has not been identified in studbook records. There remain ten unrepresented potential founders in the population.

In the short term, this program should focus on breeding the current potential founders and increasing the growth rate and effective population size. The studbook keeper should work with holding institutions to resolve unknown parentage issues. To meet long term genetic goals, the population will need to add founders (unrelated individuals from the wild or other regions) and recruit additional institutions (e.g., *Tursiops* holders) to expand the population size.

Pacific White-sided Dolphin

Lagenorhynchus obliquidens

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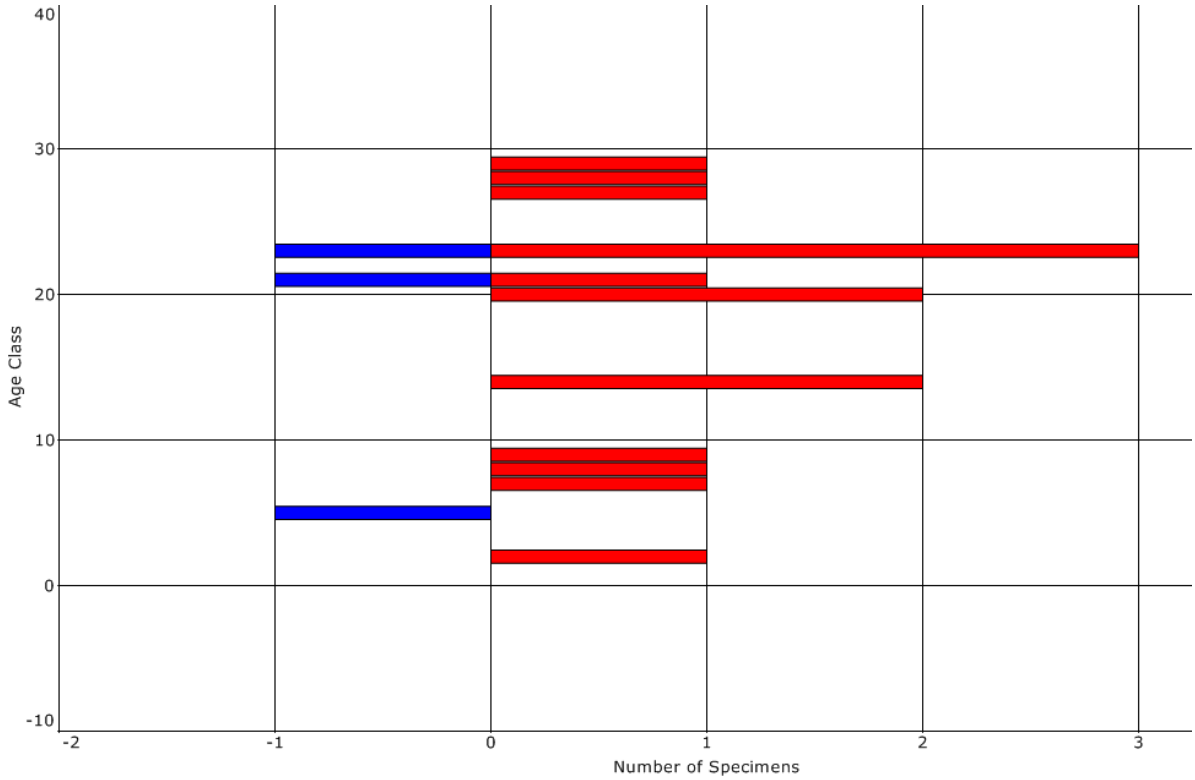

Figure 1. Age structure of the breeding population of Pacific White-sided Dolphins (2.13.1). These data cannot be run in PM2000 software, so this age pyramid is from PopLink 1.3.

Acknowledgements

The first edition of The Marine Mammal Taxon Advisory Group Regional Collection Plan was a long time in coming and we accept that it is not a perfect plan. We encourage the marine mammal community to utilize this information, question what seems “off”, but mostly, provide constructive criticism that will improve the usefulness of future editions.

The Steering Committee would like to acknowledge and express our sincere appreciation to the following individuals for their assistance with the production of this document:

The marine mammal studbook keepers for their determination to get the data compiled in time for the PMC analysis; Brad Andrews and past TAG chairs for getting us started; Melinda Pruett-Jones for her earnest attempt at the first edition (we miss you); Marilee Menard for her review and edits to our Regulatory Oversight section; Steve Thompson, Kristine Schad, and Sarah Long from the PMC for their expertise, patience and time; Kevin Willis for his guidance; Bill Winhall for species information, and John G. Shedd Aquarium for graciously hosting our planning meeting in January 2008. We would also like to thank the Marine Fish TAG for giving us the impetus for getting this done. Without the collective contributions of everyone involved, we might have been the last TAG to complete a RCP!