

Steller Sea Lion and other Research Funding at the AFSC

- New opportunities in 2001 from Congressional Appropriation of \$43.15M
- Unprecedented funding levels resulting from controversy involving role of commercial groundfish fisheries in sea lion population decline



Objectives

- Review how money was dispersed in 2001
- Summarize research framework and coordination activities
- Describe the variety of over 150 research projects underway at 25 different institutions
- Brief overview of NMFS research projects

FY2001 Funded Entities



■ National Marine Fisheries Service	\$7.85 M
■ Alaska Dept. of Fish & Game	\$2.50 M
■ University of Alaska	\$1.00 M
■ Alaska Sea Life Center	\$6.00 M
■ N. Pac. Univ. Mar. Mamm. Res. Cons.	\$0.80 M
■ NOAA-Office of Atmos. Research	\$6.00 M
■ NOAA-NOS (CIFAR)	\$2.00 M
■ N. Pac. Fish. Mgt. Council	\$2.00 M
Plus	
Steller Sea Lion Research Initiative	\$15.00 M

Research Coordination

- Meetings of research organizations in January, July, and September 2001
- Creation of research framework to identify needs and gaps
- Research coordination activities
 - Steering group composed of funded entities
 - SSL research coordinator position at NMFS
 - Web-based communications
 - PI orientation meeting
 - Symposium for presentation of results

Research Framework

Top-Down Approach Based on Factors and Hypotheses

- Reasons why population is declining
- Factors causing or contributing to the decline
- Mechanisms by which factors affect sea lions
- Specific hypotheses/questions related to each factor and mechanism

Bottom-Up Approach Based on Research Projects/Themes

- Research Projects - funded entities, categorized by:
 - Research Theme - category of research
 - Project Type - flow of data or information from project
- Specific hypotheses/questions addressed by each project

Factors Causing or Contributing to the Decline



1. Indirect effects of fisheries
2. Environmental changes
3. Direct anthropogenic effects
4. Predation
5. Disease
6. Contaminants
7. Synergies/combinations of factors listed above

Research Themes



- Life History
- Foraging
- Vital Rates
- Fish Assessment and Fisheries
- Ecosystems
- Other Anthropogenic Effects
- Predation
- Disease
- Contaminants
- Management
- Communications

Steller Sea Lion Research Projects for 2001:

Summary by Research Theme

Research Theme	# of Projects
Communications	2
Contaminants	4
Disease	2
Ecosystems	17
Fish Assessment and Fisheries	28
Foraging	42
Life History	5
Management	6
Other Anthropogenic Effects	5
Predation	13
Vital Rates	28
Grand Total	152

Institution	# of Projects
Alaska Department of Fish & Game	11
AK Sea Otter and SSL Commission	1
Alut Comm of St Paul	1
Alaska SeaLife Center	17
Bristol Bay Native Assoc	1
Colorado State University	1
Mystic Aquarium	1
Naval Postgrad School	1
National Marine Fisheries Service	37
NOAA-CIRES	1
N. Pacific Fisheries Management Council	3
N. Pacific Universities Mar. Mamm. Res. Cona	31
Old Dominion University	1
Pacific Marine Environmental Lab (OAR)	5
PWS Science and Technology Institute	3
St Andrews, UK	1
Texas A&M University	5
University of Alaska Anchorage	2
University of Alaska Fairbanks	19
University of Alaska SE	1
University of California, Davis	1
University of California, Irvine	1
University of California, San Diego	1
University of Washington	5
Yale University	1
Grand Total	152

Steller Sea Lion Research Projects for 2001: Summary by Institution

NMFS SSL Projects

Research Theme	# of Projects
Sea Lion Biology and Ecology	
Foraging	5
Vital Rates	9
Life History	2
Contaminants	1
Disease	1
Predation	5
Fish Assessment and Fisheries	9
Ecosystems	1
Management	2
Other Anthropogenic Effects	2
Grand Total	37

NMFS Sea Lion Foraging Projects

Food habits and diet, bioenergetics, habitat use

- Scat collections at haulouts and rookeries
- Blubber collections for fatty acid and stable isotope analyses
- Satellite tagging of individual sea lions
- Individual based modeling

Address questions of indirect effects of fisheries and environmental changes

NMFS Sea Lion Vital Rates Projects

Reproductive, Survival, Mortality rates; Population assessment

- Aerial surveys and pup counts
- Branding and tagging of pups (AK & Russia)
- Genetic stock structure (DNA, mtDNA)
- Rookery demographic studies (e.g., Marmot)

Baseline studies which supply information necessary to address all factors contributing to the decline

NMFS Sea Lion Life History Projects

Ontogeny, Behavior, Reproduction

- Rookery demographic studies (e.g., Marmot)
- Video installations at Benjamin Island, AK and Rogue Reef, OR

Baseline and developmental studies which supply information necessary to address all factors contributing to the decline

NMFS Predation Projects

Killer whales and Sharks

- Killer whale survey and diet
- Shark diet, archival tagging, and stock assessments
- Modeling of trophic cascade hypothesis

Address questions of effects of predation

NMFS Fish/Fisheries Projects

Large scale, Small spatial-temporal scales

- Small scale studies of fisheries effects (Atka mackerel, pollock and Pacific cod)
- Assessments of forage fish near rookeries and haulouts
- Seasonal assessments of groundfish
- Retrospective, modeling, and tagging studies

Address questions of indirect effects of fisheries and environmental changes

Other NMFS SSL Projects

- **Contaminants**
Evaluation of environmental contaminant loads in juvenile SSL
- **Diseases**
Evaluation of SSL parasites and impact assessment
- **Ecosystems**
Incorporating uncertainty in ecosystem models
- **Management**
Economic impact of regulations
Review of Russian fisheries management
- **Other Anthropogenic Effects**
Subsistence harvest evaluation

FY02 Steller Sea Lion Funding

Total: \$40.145 M

- NMFS
 - Climate Change/SSL \$ 6 M
 - Predator-Prey/SSL \$ 2 M
 - SSL Recovery Plan \$16.8 M
 - ESA/SSL \$ 0.850 M
- ADF&G \$ 2.495 M
- ASLC \$ 5 M
- NPUMMRC \$ 3.5 M
- Univ. of AK \$ 1 M
- NPFMC \$ 2 M
- ADFD \$ 0.5 M

FY02 NMFS Steller Sea Lion Research

Total Appropriation - \$ 25.65 M

Proposed Distribution

- Climate Change \$4-8 M
- SSL Core Studies \$4-5 M
- Expanded SSL Tagging \$1-2 M
- Fisheries Interaction Studies \$4-5 M
- Forage Species Assessments \$2-3 M
- Predator Studies \$1-2 M
- Vessel Support \$1-2 M
- Univ. Outreach, Contracts, Grants \$1-2 M

RACE Survey Activities for 2002

Winter Surveys:

1. Acoustic survey (EIT) for Shumagin Island Pollock
Miller Freeman, Feb 10-17
2. Acoustic survey (EIT) for southeastern Bering Sea and Bogoslof areas
Miller Freeman, Feb 19 - Mar 11
3. Acoustic survey (EIT) for Shelikof St and Eastside of Kodiak
Miller Freeman, Mar 13-27
4. Fishery Oceanography Mooring deployment in GOA with PMEL
Miller Freeman, Feb 2-9
5. Fishery Oceanography GLOBEC and Steller sea lion research in Gulf of Alaska, Bering Sea and Aleutian Islands with PMEL. *Miller Freeman, Feb 2-9*

Spring and Summer Surveys:

1. Acoustic survey (EIT) for eastern Bering Sea pollock
Miller Freeman, Jun 4 - Aug 2
2. SSL/Fishery Interactions on east side of Kodiak
Miller Freeman, Aug 14 - Sep 6
3. Annual eastern Bering Sea crab/groundfish bottom trawl survey
2 chartered trawlers, late May to end of July
4. Biennial eastern Bering Sea slope groundfish bottom trawl survey
Morning Star, early late May to end of July
5. Biennial Aleutian Islands groundfish bottom trawl survey
Vestraalan and Sea Storm, late May to end of July
6. Phase 2 of Trawllex Study of the effects of trawling on the Bering Sea sea floor and associated biota, *Ocean Explorer*, mid June to early July

Fall Surveys:

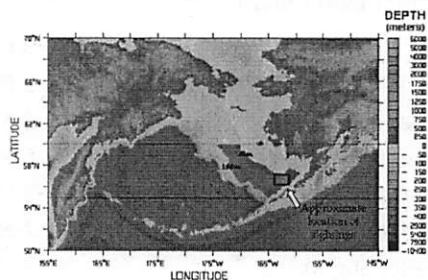
1. Fishery Oceanography forage fish early life history dynamics in GOA
Miller Freeman, Sep 8-23
2. Fishery Oceanography Mooring recovery in Bering Sea, Aleutian Islands, and Gulf of Alaska, *Miller Freeman, Sep 25 - Oct 9*

Proposed FY02 Research: North Pacific Right Whale

- ❖ Vessel surveys in the Bering Sea
 - Count animals
 - Collect biopsy samples for genetics
 - Satellite tagging
- ❖ Acoustic monitoring
 - Shipboard hydrophones
 - Bottom mounted recorders
- ❖ Aerial photogrammetry to identify individuals

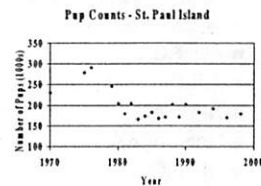


Petition to Designate North Pacific Right Whale Critical Habitat



Proposed FY02 Northern fur seal Research

- ❖ Population assessment on St. Paul and St. George Islands
- ❖ Deploy satellite recorders and time-depth recorders
- ❖ Food habits
- ❖ Monitor pup mortality
- ❖ Analyze tissue/teeth from subsistence harvest



Proposed FY02 Research: Alaska Harbor Seals

- ❖ Population abundance
 - Conduct aerial surveys in northern SE Alaska
 - Develop region-specific correction factors for aerial surveys
- ❖ Assessment of abundance at glacial haulout sites
 - Investigate utility of remote sensing at glacial haulout sites
 - Evaluate impacts of harassment in Yakutat Bay
- ❖ Continue to pursue establishment of a long-term field site
- ❖ Work with Alaska Native comanagers to revise stock structure

Proposed FY02 Research: Other Projects



- ❖ Use bottom-mounted recorders to determine distribution of large cetaceans
- ❖ Update estimate for the Central North Pacific humpback whale stock
- ❖ Assess gray whale population abundance
- ❖ Conduct surveys for ice seal distribution and habitat use
- ❖ Continue monitoring the Southeast Alaska killer whale population