USA Progress Report on Cetacean Research - May 2002 to April 2003 With Statistical Data for Calendar Year 2000

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The following information summarizes cetacean research conducted or supported by the U.S. National Marine Fisheries Service at Silver Spring, Maryland (NMFS HQ), and by the five NMFS Science Centers; Alaska Fisheries Science Center (AFSC) and Northwest Fisheries Science Center (NWFSC) in Seattle, Washington; Southwest Fisheries Science Center (SWFSC), La Jolla, California, Northeast Fisheries Science Center (NEFSC), Woods Hole, Massachusetts; and the Southeast Fisheries Science Center (SEFSC), Miami, Florida. Information was also contributed by the Alaska Department of Fish and Game (ADFG), Anchorage, Alaska, the Alaska Beluga Whale Committee (ABWC), and the North Slope Borough (NSB), Barrow, Alaska, and the National Museum of Natural History (NMNH), Smithsonian Institution, Washington, DC. The following information was compiled in consultation with the above agencies.

U.S.A. Atlantic and Gulf of Mexico Waters

1. SPECIES AND STOCKS STUDIED

Common Name	Scientific Name	Area/Stock(s)	Referred to in Section(s):
Atlantic spotted dolphin	*Stenella frontalis*	No. Gulf of Mexico	2.1, 4.1, 4.2
Atlantic white-sided dolphin	*Lagenorhynchus acutus*	western N. Atlantic	2.1, 4.2, 7.1
Beaked whale	*Mesoplodon sp.*	western N. Atlantic, Gulf of Mexico	2.1, 4.2
Bottlenose dolphin	*Tursiops truncatus*	western N. Atlantic, Florida, Gulf of Mexico	2.1, 3.1, 3.2, 4.1, 4.2, 7.1, 8, 9, 10.1, 10.2
Bottlenose whale, northern	*Hyperoodon, sp.*	western N. Atlantic, Scotian Shelf	2.1, 3.1, 4.1
Clymene dolphin	*S. clymene*	western N. Atlantic, Gulf of Mexico	2.1, 4.2, 10.1
Common dolphin	*Delphinus delphis*	western N. Atlantic	2.1, 4.1, 4.2, 7.1
Dwarf sperm whale	*Kogia simus*	western N. Atlantic, Gulf of Mexico	4.2
False killer whale	*Pseudorca crassidens*	western N. Atlantic, Puerto Rico, VI	4.2
Fin whale	*B. physalus*	western N. Atlantic	2.1, 4.1, 6.1, 8
Harbor porpoise	*Phocoena phocoena*	western N. Atlantic	4.2, 7.1
Humpback whale	*Megaptera novaeangliae*	western N. Atlantic	2.1, 3.1, 4.1, 4.2, 8, 10.1
Minke whale	*B. acutorostrata*	western N. Atlantic	4.2, 6.1
Pantropical spotted dolphin	*Stenella attenuata*	western N. Atlantic, Gulf of Mexico	4.2, 10.1

Common Name	Scientific Name	Area/Stock(s)	Referred to in Section(s):
Pilot whale	*Globicephala sp.*	western N. Atlantic, Gulf of Mexico	2.1, 4.2, 7.1
Pygmy sperm whale	*Kogia breviceps*	western N. Atlantic, Gulf of Mexico	4.2
Pygmy killer whale	*Feresa attenuata*	western N. Atlantic	4.2
No. Right whale	*Balaena glacialis*	western N. Atlantic	2.1, 3.1, 4.1, 4.2
Risso's dolphin	*Grampus griseus*	western N. Atlantic, Gulf of Mexico	2.1, 4.2, 7.1
Rough-toothed dolphin	*Steno bredanensis*	Florida, Gulf of Mexico	4.2
Sperm whale	*Physeter macrocephalus*	western N. Atlantic, Gulf of Mexico	2.1, 3.1, 4.2, 8, 10.1
Spinner dolphin	*S. longirostris*	Gulf of Mexico	2.1, 4.2
Striped dolphin	*S. coeruleoalba*	western N. Atlantic, Gulf of Mexico	2.1, 4.2

2. SIGHTINGS DATA

2.1 Field Work

Shipboard Surveys

NEFSC

NOAA R/V Albatross IV - No. Right Whale Survey conducted from 29 April to 17 May, 2002.
The study area included Great South Channel, the waters of Cashes Ledge and Platts Bank in the northwestern part of the Gulf of Maine, and extended to Cultivator Shoal and Georges Shoal (northwest Georges Bank). The survey was conducted along non-random track lines that were determined based on the location of right whales and environmental factors. Right whale sightings were reported daily via email and cell phone to the Right Whale Sighting Advisory System (SAS) for notification to commercial and military mariners about the presence of endangered whales in their travel area. The total number of right whales sighted was 63 and 6 right whale biopsies were collected. (Contact: F. Wenzel NEFSC).

NOAA Ship *Delaware II. Large Whale Survey conducted from August 5th to 28th 2002 in Canadian territorial waters*.
The 2002 a survey of the Scotian Shelf in Canadian waters extending from Brown's Bank in the west to the Laurentian Channel in the east. Survey tracks were based upon sparse past records of whale sightings, as well as assumptions concerning bathymetric characteristics of likely large whale habitats. The first leg of the survey was conducted in the Eastern Scotian Shelf, where the most common mysticete the humpback whale; major concentrations of humpbacks were found on the Stone Fence and on the northern edge of Banquereau Bank. Bottlenose whales were observed in the Gully together with a single sperm whale and various odontocetes. Other sperm whales were recorded in the Laurentian Channel, to the east of the Stone Fence. Other species of cetacean observed included bottlenose dolphins (*Tursiops truncatus*), common dolphins (*Delphinus delphis*), long-finned pilot whales (*Globicephala melaena*) and Atlantic white-sided dolphins (*Lagenorhynchus acutus*). The second leg of the survey was conducted in the Western Scotian Shelf where fin and right whales were the most common large whales observed, especially on Roseway Basin. Fin and humpback whales were the most abundant species on Browns Bank. Sei whales (*Balaenoptera borealis*) were found in low numbers in both regions. A total of 62 biopsy samples were obtained, from 22 humpback whales, 16 right whales, 4 fin whales, 9 bottlenose whales and 11 common dolphins. (Contact: P. Clapham NEFSC)

NOAA Ship Delaware II. Marine mammal distribution and habitat use survey (Georges Bank and Bear Seamount) conducted from July 18 to August 1, 2002.

Surveying was conducted under two modes (i.e., primary and secondary). During primary mode (July 18-23; July 30-August 1), surveying was conducted along predetermined transect lines. During secondary mode (July 24-29), surveying was conducted in association with daytime trawling near Bear Seamount, and "transect lines" were not predefined. Four scientists conducted standard line transect sampling. In addition to sighting data, effort data were logged by a recorder, environmental data were obtained and plankton sampling was conducted using a 505 mesh bongo. Biopsy tissue samples were collected offshore bottlenose dolphin (1), spotted dolphin (2) and common dolphin (1). The sighting survey covered approximately 436 nautical miles of track line. There were 11 species of identifiable cetaceans seen during the survey: fin, pilot , beaked (Cuvier's, and North Sea), and sperm whales, bottlenose, common, spinner, spotted (2 species), striped, and Risso's dolphins (Contact: G. Waring NEFSC).

SEFSC

See Section 8 "Other Studies and Analyses"

Aerial Surveys

NEFSC

NOAA DeHavilland Twin Otter. "Circle-Back Method" Experimental Abundance Survey conducted from July 19 to August 16, 2002.
The primary objective of the survey was to determine the feasibility of using the "circle-back method"(Hibby 1999) to calculate an abundance of cetaceans and turtles which includes an estimate of *g(0)*, the probability of detecting a group on the track line. Fourteen days of on-effort surveying covered 4,156 nautical miles of track line in 69.5 flight hours. Eleven species of identifiable cetaceans were seen. Preliminary indications of the feasibility of this methodology is that it is a practical way of collecting data. (Contact: D. Palka NEFSC)

NOAA DeHavilland Twin Otter Right Whale Aerial Photogrammetry Survey conducted from August 24 to September 11, 2002 in cooperation with the NMFS Southwest Fisheries Science Center
The 2002 right whale photogrammetry survey resulted in 3000 feet of film taken during 38.3 hours of surveying and approximately 73 individual right whales were photographed using an image motion compensated 5" format, military reconnaissance camera, mounted vertically over the camera port in the NOAA Twin Otter. Vertical aerial photographs of North Atlantic right whales in the Bay of Fundy have been collected during August-September 2000, 2001 and 2002. At present, about 105 whales have been matched to the New England Aquarium catalogue from the 2000 field season and approximately 68 (+18 calves) whales were identified from the 2001 sample. Total length has been measured for 100 matched whales and 18 calves. There was no apparent difference in the length-width relationship between the 2000 and 2001 seasons, cows with calves were found to be significantly narrower than other right whales. (Contact: W. Perryman SWFSC and T. Cole NEFSC).

2002 Right Whale Sighting Advisory System (SAS) surveys
Systematic aerial line transects for right whales (*Eubalaena glacialis*) were conducted between late March and mid-July, 2002, and from mid-September through December, 2002. The study area encompassed waters from eastern Long Island (72° 51' W) east to the Hague Line (66° 30' W), and from the New York shipping lanes and the southern edge of Georges Bank (40° 21' N) north to the entrance of the Bay of Fundy (44° 40' N). A series of 16 transect lines spaced 20 nautical miles apart was completed 6 times in 59 flights. On 40 additional flights, fine scale surveys were made over small, bathymetrically defined areas in search of right whale aggregations. During the surveys, observers were on watch for a total of 396 hours and recorded 794 sightings of right whales including re-sights of many individuals (Contact T. Cole NEFSC).

SEFSC

Southwestern Atlantic
From 15 July to 31 August 2002, an aerial survey was conducted on the continental shelf between Sandy Hook, New Jersey and Ft. Pierce, Florida. The primary goal of the survey was assessment of coastal bottlenose dolphin in water

depths between 0-40m. A total of 6,734 km of trackline were flown on effort. 185 bottlenose dolphin groups were sighted a total of 2,544 individuals. In addition, 37 groups (384 animals) of *Stenella frontalis* and 1 group (9 animals) of *Stenella clymene* were encountered during the survey. (Contact: L. Garrison, SEFSC)

From 15 November to 30 March 2002, the southeast early warning system surveys were conducted between Savannah, Georgia and St. Augustine, Florida. These surveys monitor the presence of Northern Right Whales, *Balaena glacialis*, in their southeast U.S. calving grounds. The survey provided daily coverage, where operational conditions allowed, of the region along transect lines perpendicular to the shoreline spaced 3 nautical miles apart and extending to 35-45 nautical miles from shore. Upon sighting whales, the aircraft circled to take photographs for use in identifying individual animals. Sighting information was relayed to commercial and military vessels in the area to notify mariners of the presence of right whales in the area and reduce the likelihood of mortality due to ship strikes. Surveys of this type have now been flown in each calving season since 1995. (Contact: B. Zoodsma, SER)

There were no sighting surveys conducted in the Gulf of Mexico during 2002.

2.2. Analyses/Development of Techniques

None reported

3. MARKING DATA

3.1. Field work

Natural Marking Data for Calendar Year 2002

NEFSC

Species	Area/Stock	New Animals ID'd	Total cataloged	Contact Person/Institute
No. Atlantic right whale, *Eubalaena glacialis*	Bay of Fundy	N/A	73*	W. Perryman, SWFSC T. Cole, NEFSC
No. Atlantic right whale, *Eubalaena glacialis*	Great South Channel	N/A	~25	F. Wenzel, NEFSC
No. Atlantic right whale, *Eubalaena glacialis*	Western Scotian Shelf	N/A	~35	F. Wenzel, NEFSC
Humpback whale, *Megaptera novaeangliae*	Western Scotian Shelf	N/A	~50	F. Wenzel, NEFSC
No. bottlenose whale, *Hyperoodon ampullatus*	Western Scotian Shelf	N/A	20	P. Clapham, NEFSC
Sei whale, *Balaenoptera borealis*	Platt's Bank in Gulf of Maine	N/A	4	F. Wenzel, NEFSC

* Using sophisticated camera systems in Photogrammetry Aerial Survey (see section 2.1)

SEFSC

Species	Area/Stock	New Animals ID'd	Total cataloged	Contact Person/Institute
Bottlenose dolphin *Tursiops truncatus*	Mississippi Sound	27	836	K. Mullin, SEFSC
Sperm whale *Physeter macrocephalus*	Gulf of Mexico	35	102	

3.2. Telemetry Data (satellite radio, Time Depth Recorder (TDR tags)) for Calendar Year 2002.

SEFSC

Species	Area/Stock	Tag Type	No. Deployed	Contact Person/Institute
Bottlenose dolphin, *Tursiops truncatus*	Mid-Atlantic	satellite	6	A. Hohn, SEFSC

4. TISSUE/BIOLOGICAL SAMPLES COLLECTED

4.1. Biopsy Samples for Calendar Year 2002

NEFSC

Species	Area/Stock	No. Samples	Contact Person/Institute
No. Atlantic right whale, *Eubalaena glacialis*	Great South Channel Georges Bank	6	F. Wenzel, NEFSC
No. Atlantic right whale, *Eubalaena glacialis*	Scotian Shelf	16	P. Clapham, NEFSC
Humpback whale, *Megaptera novaeangliae*		22	
Fin whales, *Balaenoptera physalus*		4	
No. Bottlenose whale, *Hyperoodon* sp.		9	
Common dolphin, *Delphinus delphis*		11	
Bottlenose dolphin, *Tursiops truncatus*	Georges Bank Bear Seamount	1	G. Waring, NEFSC
Spotted dolphin (unidentified), *Stenella* sp.		2	
Common dolphin, *Delphinus delphis*		1	

SEFSC

Species	Area/Stock	No. Samples	Contact Person/Institute
Bottlenose dolphin, *Tursiops truncatus*	Atlantic	315	K. Mullin, SEFSC
Atlantic spotted dolphin, *Stenella frontalis*	Atlantic	46	
Fin whale, *B. physalus*	Atlantic	1	
Humpback whale, *Megaptera novaeangliae*	Atlantic	9	

4.2. Samples from stranded animals for the Calendar year 2002. Samples taken from stranded animals include some or all of the following: hard parts (i.e., teeth, skull, baleen, entire skeleton, etc.) soft parts (i.e., skin, gonads, stomach, muscle, blubber, blood, etc.)

NEFSC

Species	Area/Stock		Total Samples	Contact Person/Institute
	Mid-Atlantic	NW Atlantic		Dana Hartley, NMFS, Northeast Regional Office
Bottlenose dolphin, *Tursiops truncatus*	49	2	51	
Common dolphin, *Delphinus delphis*	3	21	24	
Gervais beaked whale, *Mesoplodon europaeus*	2		2	
Risso's dolphin, *Grampus griseus*	1	4	5	
Harbor porpoise, *Phocoena phocoena*	3	39	42	
Humpback whale, *Megaptera novaeangliae*	1	3	4	
Minke whale, *Balaenoptera acutorostrata*	1	4	5	
Pilot whale (long-finned), *Globicephala* sp.		56	56	
Pygmy sperm whale, *Kogia breviceps*	1	1	2	
Right whale, *Balaena glacialis*	1	1	2	
Rough-toothed dolphin, *Stena bredanensis*	14		14	
Sperm whale, *Physeter macrocephalus*		1	1	
Striped dolphin, *Stenella coeruleoalba*		2	2	
White-sided dolphin, *Lagenorhynchus acutus*	1	42	43	
Unidentified dolphin	1	1	2	
Unidentified stenella	1		1	
Unidentified whale		1	1	

SEFSC

The following table is preliminary as the SEFSC is in the process of switching over to the new national stranding database and the 2002 data was not all entered in an electronic format at the time of this reporting. The sampling data will be provided as soon as it becomes available.

Species	Area/Stock: Atlantic/ Gulf of Mexico	No. Strandings		No. samples	Contact Person/Institute: Blair Mase and Jenny Litz, SEFSC
		dead	live		
Minke whale, *Balaenoptera acutorostrata*	No. Carolina	2		N/A	
Common dolphin, *Delphinus delphis*	No. Carolina	4		N/A	
Right whale, *Eubalaena glacialis*	No. Carolina	1		N/A	
Risso's dolphin, *Grampus griseus*	No. Carolina Florida	1 2		N/A	
Pygmy killer whale, *Feresa attenuata*	PR/VI	1		N/A	
Pygmy sperm whale, *Kogia breviceps*	Texas Florida Georgia So. Carolina No. Carolina	1 7 1 3 3	1 8 1 2 2	N/A	

Cont.

Species	Area/Stock: Atlantic/ Gulf of Mexico	No. Strandings		No. samples
		dead	live	
Dwarf sperm whale, *Kogia simus*	Texas Florida PR/VI	 1 1	1 6 1	N/A
Unidentified *Kogia* sp.	Texas Florida Georgia No. Carolina	2	 2 2 1	N/A
Fraser's dolphin, *Lagenodelphis hosei*	PR/VI	1		N/A
Humpback whale, *Megaptera novaengliae*	Florida No. Carolina PR/VI	1 3 1		N/A
Blainville's beaked whale, *Mesoplodon densirostris*	PR/VI	1		N/A
Unidentified *Mesoplodon* sp.	No. Carolina	1		N/A
Melon-headed whale, *Peponocephala electra*	PR/VI	1		N/A
Harbor porpoise, *Phocoena phocoena*	No. Carolina	5		N/A
Sperm whale, *Physeter macrocephalus*	Florida So. Carolina	2 1		N/A
False killer whale, *Pseudorca crassidens*	No. Carolina PR/VI	1	 1	N/A
Pantropical spotted dolphin, *Stenella attenuata*	Florida No. Carolina	1 1		N/A
Clymene dolphin, *Stenella clymene*	Florida		1	N/A
Striped dolphin, *Stenella coeruleoalba*	No. Carolina	2	1	N/A
Atlantic spotted dolphin, *Stenella frontalis*	Florida No. Carolina	1 1	1 1	N/A
Spinner dolphin, *Stenella longirostris*	PR/VI	2		N/A
Unidentified *Stenella* sp.	Florida No. Carolina	1 1	1	N/A
Rough-toothed dolphin, *Steno bredanensis*	Florida		1	N/A
Bottlenose dolphin, *Tursiops truncatus*	Texas Louisiana Mississippi Alabama Florida Georgia So. Carolina No. Carolina PR/VI	145 2 18 12 122 11 25 90 5	4 8 3 1	N/A
Unidentified cetacean	Florida No. Carolina Texas	1 2 1	1	N/A

Cont.

Species	Area/Stock: Atlantic/ Gulf of Mexico	No. Strandings		No. samples	
		dead	live		
Unidentified dolphin	Florida Georgia So. Carolina No. Carolina PR/VI	8 1 2 	 1 1	N/A	
Cuvier's beaked whale, *Ziphius cavirostris*	So. Carolina	1		N/A	

5. POLLUTION STUDIES
None reported

6. STATISTICS FOR LARGE CETACEANS

6.1. Other Non-Natural (e.g., Ship Strike, Entanglement) Mortalities For The Calendar Year 2000 as Reported in Waring *et al*. 2002.

NEFSC

Species	Area/Stock	Sex	Cause	Methodology
Fin whale, *Balaenoptera physalus*	(located in New York harbor)	F	ship strike	*Review of NMFS records
Minke whale, *Balaenoptera acutorostrata*	(located in Rockland, ME)	unknown	entanglement	*Review of NMFS records

* Subsequent review of NMFS/NER stranding records found sufficient information to confirm the cause of death as collision with vessel or fishery interaction/entanglement.

7. STATISTICS FOR SMALL CETACEANS

7.1. Incidental Mortalities For The Calendar Year 2000 as Reported in Waring *et al*. 2002.

NEFSC and SEFSC

Species	Area/Stock	Incidental Mortality		
		Reported	Est. Total	Fishery type
Bottlenose dolphin, *Tursiops truncatus*, coastal stock	Mid-Atlantic Florida coast	3 1	202 4	Coastal gillnet So. Atlantic shark gillnet fishery
Bottlenose dolphin, *Tursiops truncatus*, offshore stock	NW Atlantic	1	132	Northeast sink gillnet
Common dolphin, *Delphinus delphis*	NW and Mid-Atlantic	6	273	So. New England *Loligo* squid trawl
Harbor porpoise, *Phocoena phocoena*	Gulf of Maine/ Bay of Fundy and Mid-Atlantic	15 1	507 21	Northeast sink gillnet Mid-Atlantic coastal gillnet
Pilot whales, *Globicephala* sp.	NW Atlantic and Mid-Atlantic	2 1	34 24	So. New England *Illex* squid trawl pelagic longline
Risso's dolphin, *Grampus griseus*	NW and Mid-Atlantic	1 1	41 15	Pelagic longline Northeast sink gillnet
White-sided dolphin, *Lagenorhynchus acutus*	NW Atlantic	1	26	Northeast sink gillnet

8. OTHER STUDIES AND ANALYSES

NEFSC

East Coast Lightship Meteorological Data

This ongoing project was funded in 2001 as a component of the History of Marine Animal Populations (HMAP) project under the Census of Marine Life. Atmospheric and oceanographic data collected at lightships along the east coast is being rescued, converted into standard units of measurement, and archived. The data will be used in determining past environmental conditions to better interpret historic records of marine mammal and fish populations (Contact: T. Smith NEFSC).

Sperm Whale Catch History

A workshop was conducted in July 2002 (Smith and Reeves 2003, SC/55/O16) that outlined a research program designed to provide annual regional estimates of catches of sperm whales by all fisheries from the mid-18th century to the early 20th century. This program was designed to make use of voyage logbooks to determine the changing spatial distribution of sperm whaling over time, as well as oil yields per whale caught and numbers of sighted vessels. The largest costs will be reading a representative sample of the roughly 5,000 extant logbooks from the US fishery. Subsequent to that workshop, a complete database of information about each of the US voyages was assembled. Secondary sources on 19th century whaling voyages were compared to determine consistency, and preliminary comparisons to original whaling logbooks were begun. The voyage database will be augmented with information from a sample of logbooks, and information on numbers and distribution of sperm whale catches for those voyages are planned to be used to estimate regional annual catches (Contact T. Smith and E. Josephson, NEFSC).

SEFSC

Gulf of Mexico:

From July 2002 through March 2003, a photo-identification study of bottlenose dolphins in Mississippi Sound (north-central Gulf of Mexico) was conducted. Mississippi Sound is a 1600 km^2 marine area with as many as 2000 bottlenose dolphins. These photo-identification surveys built on previous photo-id work but focused on three small discreet habitat areas to test hypotheses about ranging patterns and site-fidelity of dolphins. The results of this work are part of an overall study of bottlenose dolphin stock structure in inshore waters of the Gulf of Mexico. Systematic surveys were conducted from a 7-m boat in each area on 18 survey days and dolphin groups photographed. Twenty-seven dolphins were added to the Mississippi Sound bottlenose dolphin catalog in 2002 which contains a total of 836 dolphins (Contact: K. Mullin, SEFSC).

Sperm whale photo-identification studies were continued in a 53,000 km^2 region south of the Mississippi River delta in the north-central Gulf of Mexico. The objectives of this ongoing study are to collect photo-identification data to test hypotheses concerning the site-fidelity and association patterns of sperm whales. Surveys were conducted from an 18-m vessel during July, September, October and November 2002 and April 2003. Systematic surveys were conducted in a zig-zag pattern along the 1000-m isobath for 3 to 5 days each month. A two-element passive acoustic array was used to track and locate sperm whales for photo-identification. Thirty-five whales were added to the SEFSC sperm whale catalog from these surveys and the catalog contains 102 individual whales (Contact: K. Mullin, SEFSC).

Southwestern Atlantic

From 22 July to 23 August 2002 a survey was conducted between Virginia Beach, Virginia and Cape Fear, North Carolina to collect skin biopsy samples from bottlenose dolphins, *Tursiops truncatus*, for genetic analysis to identify habitat boundaries between the coastal and offshore ecotypes. The survey was accomplished using small vessels as biopsy platforms working in concert with "spotter" airplanes surveying along systematic tracklines. Forty-four groups (645 animals) of *T. truncatus* were encountered during the survey and biopsy samples from 50 individuals were collected. In addition, 21 groups (285 animals) of *Stenella frontalis* were encountered and 29 biopsy samples were collected. All biopsy samples are currently being analyzed at the NOS lab in Charleston, SC (Contact: R. Baird, SEFSC).

From 16 January to 25 March 2003, a systematic survey was conducted between Oregon Inlet, North Carolina to Cape Fear, North Carolina using small vessels to collect biopsy samples from bottlenose dolphins, *Tursiops truncatus*. The samples will be used to describe the winter distribution of the coastal vs. offshore morphotypes and provide additional information on stock structure. A total of 67 biopsy samples were collected from bottlenose

dolphins. In addition, 25 samples were collected from *S. frontalis*, 9 from humpback whales *Megaptera novaeangliae,* and 1 from a fin whale *B. physalus*. All biopsy samples are currently being analyzed at the NOS lab in Charleston, SC (Contact: R. Baird, SEFSC).

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USA Progress Report on Cetacean Research - May 2002 to April 2003 With Statistical Data for Calendar Year 2000

U.S.A. Pacific Waters

1. SPECIES AND STOCKS STUDIED

Common Name	Scientific Name	Area/Stock(s)	Referred to in Section(s):
Baird's beaked whale	*Berardius bairdii*	Oregon, Northeast Pacific, Southeast Bering Sea	2.1, 4.1, 4.3
Beaked whale	*Mesoplodon sp.*	Eastern Tropical Pacific, Oregon Northeast Pacific	2.1
Beluga whale	*Delphinapterus leucas*	Alaska, N. Pacific	2.1, 3.2, 4.1, 4.2, 4.3, 5, 7, 8, 10.1
Blue whale	*Balaenoptera musculus*	California	4.1, 4.3, 10.1
Bottlenose dolphin	*Tursiops truncatus*	California, Eastern Tropical Pacific, western N. Atlantic, Florida	4.1, 4.3, 10.1
Bowhead whale	*B. mysticetus*	Alaska, western U.S. Arctic	4.2, 10.1
Common dolphin	*Delphinus delphis*	California, Eastern Tropical Pacific, N. Pacific	4.1, 4.3, 4.4, 7.2
Cuvier's beaked	*Ziphius cavirostris*	Oregon, Northeast Pacific, Bahamas	4.3
Dall's porpoise	*Phocoenoides dalli*	Alaska, California, Washington, N. Pacific, Oregon, Southeast Bering Sea	2.1, 4.1, 4.3
Fin whale	*B. physalus*	California, N. Pacific, Oregon, Southeast Bering Sea	2.1, 3.1, 4.1, 4.3
Gray whale	*Eschrichtius robustus*	California, Washington, NE and NW Pacific, Oregon	2.1, 3.1, 4.1, 4.2, 4.3, 5, 10.1
Harbor porpoise	*Phocoena phocoena*	Alaska, eastern N. Pacific, Oregon, Northeast Pacific; Southeast Bering Sea, Washington	2.1, 3.2, 4.3, 7.2
Humpback whale	*Megaptera novaeangliae*	California, Hawaii, No. Pacific, Alaska, Japan and Mexico, Oregon, Southeast Bering Sea	2.1, 3.1, 4.1
Killer whale	*Orcinus orca*	Alaska, British Columbia, Oregon, Northeast Pacific; Southeast Bering Sea, California, Eastern Tropical Pacific	2.1, 3.1, 4.1, 4.3, 5.0, 8, 10.1, 10.2
Minke whale	*B. acutorostrata*	California, N. Pacific, Oregon, Southeast Bering Sea	2.1, 4.1, 6.2
Northern right whale	*Eubalaena glacialis Eubalaena japonica*	North Pacific, Southeast Bering Sea	4.3, 4.4, 7.2
Northern right whale dolphin	*Lissodelphis borealis*	Oregon, Northeast Pacific	4.3, 4.4, 7.2

Common Name	Scientific Name	Area/Stock(s)	Referred to in Section(s):
Pacific white-sided dolphin	*L. obliquidens*	California, Eastern Tropical Pacific, N. Pacific, Oregon	4.1, 4.4, 7.2
Pantropical spotted dolphin	*Stenella attenuata*	Eastern Tropical Pacific	4.1
Risso's dolphin	*Grampus griseus*	California, Eastern Tropical Pacific, Oregon, Northeast Pacific	4.1, 4.3, 7.2
Sperm whale	*Physeter macrocephalus*	California, N. Pacific, Eastern Tropical Pacific, Oregon	2.1, 2.2, 3.1, 4.1
Spinner dolphin	*S. longirostris*	Eastern Tropical Pacific	4.1, 8
Striped dolphin	*S. coeruleoalba*	Eastern Tropical Pacific, California	
Stejneger's beaked whale	*Mesoplodon stejnegeri*	Washington, NE Pacific	2.1

2. SIGHTINGS DATA

2.1. Field Work

Shipboard Surveys

AFSC

Gray Whales off Washington Coast
From March 28, 2002 to February 6, 2003, vessel surveys were conducted along the northwestern coast of Washington, Oregon, northern California, the Strait of Juan de Fuca, and off the west coast of Vancouver Island, Canada. The surveys lasted approximately 100 hours and covered 1313 nautical miles. During these surveys, 59 gray whales were sighted and 39 were photographed for identification. Approximately 20% of the sightings were made in the Strait of Juan de Fuca, 29% on the northwest coast of Washington, and 37% off the west coast and southwest coast of Vancouver Island. The same number of sightings (7%) was made off Oregon and northern California. (Contact: M. Gosho, AFSC)

Gray whales off Kodiak Island, Alaska
From 14-19 August, 2002, Ugak Bay, offshore the southeast coast of Kodiak Island, Alaska was surveyed for gray whales. Surveys were conducted from a 44 ft (14m) fishing boat and 14 ft (4.5m) inflatable Zodiac. Gray whales were approached and photographed from both sides whenever possible. In addition, ten fecal samples were collected near feeding whales using a modified plankton net. Benthic samples were also obtained at 12 stations in and around Ugak Bay, using a $0.1m^2$ van Veen grab, as used in sampling gray whale feeding areas in the Chirikov Basin. Provisional results of the prey sampling suggest gray whales offshore Kodiak were feeding on exceptionally dense assemblages of cumaceans. (Contact: P. Gearin and S. Moore, AFSC)

Bering Sea shelf cetacean survey
A cetacean line-transect survey was conducted in conjunction with an acoustic-trawl survey for walleye pollock on the Bering Sea shelf from 9 June to 28 July 2002 aboard the NOAA ship *Miller Freeman*. The objective was to examine the abundance and distribution of cetacean species across the three hydrographic domains on the Bering Sea shelf and compare to previous survey years. The survey included 5516 km of effort during which 312 cetacean sightings were made. Eight species were identified in the following percentages: 54% Dall's porpoise (168 sightings), 18% harbor porpoise (57 sightings), 9% fin whales (27 sightings), 7% minke whales (21 sightings), 6% killer whales (19 sightings), 5% humpback whales (17 sightings), 1% sperm whales (2 sightings) and 0.3% Stejneger's beaked whale (1 sighting). (Contact: J. Waite, AFSC).

Southeast Alaska killer whale survey

Two 14-day killer whale cruises were completed in Southeast Alaska in May and September 2002. The main focus of the survey was to estimate the abundance and movement patterns of killer whales using photo-identification techniques. A total of 10 killer whale encounters occurred representing whales from both the transient and resident groups. In addition to the photo-identification research, biopsy sampling was also conducted. Genetic and contaminant studies are currently being completed using these tissue samples. Long-term studies conducted on Southeast Alaskan transient killer whales (1989 through 2002) are being used to help develop a framework for photographic analysis of other killer whale populations and are being used to provide baseline data on killer whale survival. (Contact: M. Dahlheim, AFSC).

Central Alaska and Aleutians killer whale survey

From 10 July to 21 August, 2002, the second year of a three-year vessel survey was conducted from approximately Seward in central Alaska to Tanaga Pass in the Aleutian Islands. The main focus of the survey was to estimate the abundance of killer whales using both line-transect and mark-recapture methods. A total of 2,256 nm were surveyed on effort. There were 16 encounters (~307 individuals) of killer whale groups. Killer whale groups were provisionally classified by type (based on behavior, external morphology and group size) as 12 groups of resident-type (~279 individuals), 3 groups of transient-type (25 individuals), and 1 group of unknown type (3 individuals). Overall, a total of 602 sightings of cetaceans were made, including harbor porpoise (3 sightings), Dall's porpoise (213 sightings), Baird's beaked whale (3 sightings), sperm whale (12 sightings), minke whale (36 sightings), humpback whale (132 sightings), and fin whale (142 sightings). (Contact: P. Wade and J. Waite, AFSC)

SWFSC

North Pacific Right Whale Aerial and Vessel Survey

A marine mammal assessment survey of the waters of the Bering Sea and Gulf of Alaska was conducted in 2002 for 51 sea days and covered 10,148 km of effort. The primary focus was on Northern Right Whales (*Eubalaena japonica*) and sperm whales (*Physeter macrocephalus*) The main goals included biopsy sampling, acoustic study and photo-identification. A total of 613 cetacean schools were observed during the cruise and 53 biopsy samples were collected. Approximately 66 killer whales, 62 humpback whales, 10 right whales and 2 fin whales were approached and photographed. Additionally, sonobouys were deployed opportunistically and at least 11 distinct right whale recordings were obtained along with recordings from fin, humpback, killer, and sperm whales. (Contact: R. LeDuc, SWFSC).

Hawaiian Island Cetacean Ecosystem and Abundance Survey (HICEAS)

A 2002 marine mammal assessment survey was conducted in the waters of the Hawaiian Island Chain extending offshore to the limits of the U.S. Exclusive Economic Zone. The overall objective was to estimate the abundance and understand the distribution of dolphins and whales in the waters around the Hawaiian Islands. In addition, biological and oceanographic data were collected to better characterize the cetaceans' environment. Other objectives included biopsy sampling, photo-identification, and acoustic study of sounds produced by Hawaiian cetaceans. The survey resulted in the sighting of 415 cetacean schools and 18,556 seabird sightings. Biopsies and sloughed skin were collected for genetic analyses and resulted in 144 samples. Acoustic sampling from a towed hydrophone array resulted in a total of 441 recordings, with 5 additional recordings from low frequency sonobouys. The area proved to be relatively barren, averaging approximately two sightings per day. Several sightings, biopsies and acoustic recordings of Bryde's whales showed them to be all in the western area of the survey.The first Pacific recording was obtained from sei whales. (Contact: J. Barlow, SWFSC).

Antarctic killer whale phylogenetics

A preliminary field investigation into the phylogenetics of killer whales in Antarctica was begun aboard the U.S. Coast Guard Icebreaker Polar Star during the 2001-2002 season. Three different forms of killer whales have been identified in the Southern Ocean based on field identifications and literature searches. A morphotype of killer whale that regularly occurs in the McMurdo Sound area of the Ross Sea was targeted for biopsy efforts and 18 samples were collected for genetics analyses. (Contact: R. Pitman, SWFSC).

Aerial Surveys

AFSC

Harbor porpoise surveys
Aerial surveys for harbor porpoise were conducted in the coastal (to the 200m isobath) and inland waters of Oregon, Washington and British Columbia from 42-50^0 N from 5 Aug - 11 Sept 2002. Concurrent small boat surveys were conducted in the inland waters of Washington State. Excellent survey conditions existed, with about 80% of the effort with Beaufort 0 or 1. A total of 477 harbor porpoise groups were observed during the survey which covered 1,077 km of transect line. (Contact: J. Laake, AFSC)

Aerial Surveys of Beluga Whales in Cook Inlet, Alaska
Beluga whales in Cook Inlet, Alaska, was surveyed 4-11 June 2002 in a manner consistent with techniques used since 1994 (Rugh *et al.,* 2000). Whale distribution was highly stratified, with almost all sightings occurring near a few river mouths or along shallow mud flats. This distribution has been fairly constant during the past several years, although it is much more limited than it was prior to the 1990s (Rugh *et al.,* 2000). Index counts (using median counts from each site where whales were seen, not corrected for missed whales) declined from the start of the surveys in 1994 until the native hunt ended in 1999 (281, 324, 307, 264 and 193, respectively). Since then, the index counts have been fairly steady (217, 184, 211 and 192). (Contact D. Rugh, AFSC).

Aerial Survey for Gray Whales in the northern Bering and southern Chukchi Seas
Five line transect aerial surveys (total effort 42,109 km) for gray whales in the northern Bering and southern Chukchi seas were conducted from 29 July through 3 August 2002. Survey effort focused the Chirikov Basin, the portion of the northern Bering Sea between St. Lawrence Island and Bering Strait, a 'prime' feeding habitat for gray whales in the 1980s. Gray whale distribution was restricted to the northernmost portion of the Basin and sighting rates were 3 to 17-fold lower than in the 1980s (Moore et al., 2003). A large aggregation of gray whales were seen on a single exploratory survey in the southern Chukchi Sea and sighting rates there were 16-fold higher than in the Chirikov Basin. These results suggest a decrease in gray whale foraging in the Chirikov Basin and possible increase in foraging northward. (Contact: S. Moore, AFSC).

SWFSC

Gray Whale northbound cow/calf shore-based and aerial surveys
Aerial surveys were conducted during both the southbound and northbound migrations of California gray whales in order to assess the reproductive condition of females, the overall condition of the population, and to examine the temporal segregation of the migrating whales. Photos taken during aerial surveys are used to help determine mortality rates for calves and aid in evaluating conditions of individual animals. Results from previous gray whale aerial and land based surveys in 1994 through 2000 were published in 2002 (Perryman et al. 2002). (Contact: W. Perryman, SWFSC).

2.2. Analyses/Development of Techniques

SWFSC

Pregnancy detection from skin samples
Techniques are being developed that can detect pregnancy, lactation, sexual maturation, and seasonal, gonadal recrudescence in free ranging cetaceans. In the past, the methods to assess these physiological conditions in cetaceans where either opportunistic (i.e. dependant on stranded or fishery involved animals) or harmful to the study animals. This new technique measures the levels of reproductive steroids found in the blubber just below the surface of the skin. Samples are obtained by a well-established method of projectile biopsy currently used to collect skin for genetic data. The steroids are then removed from the blubber samples through a series of organic extractions and then quantified by enzyme immunoassay (EIA). The quantities of these hormones allow us to assess the reproductive state of individuals with an empirically determined margin of error. (Contact: N. Kellar, SWFSC).

Sperm whale Single Nucleotide Polymorphisms
Research is underway to develop and apply single nucleotide polymorphism (SNP) markers for sperm whales to complement and further the genetic studies done to date. Primers for the assays will be synthesized and tested individually for genotyping accuracy against the samples with known sequence. Thus far, several variable loci for sperm whales have been identified, but additional loci need to be identified before the approach can be used to address sperm whale genetic questions. (Contact: P. Morin and S. Mesnick, SWFSC)

3. MARKING DATA

3.1. Field work - Natural Marking Data for Calendar Year 2002.

AFSC

Humpback whales: The North Pacific Humpback Whale photo-identification collection currently has over 24,000 photographs in the computer-assisted matching database. Results from a paper on adult mortality estimation were presented by Mizroch at the Europhlukes Conference in Madeira in November 2002. Over 16,000 new humpback whale flukes photographs taken throughout the North Pacific are being integrated into the database. (Contact: S. Mizroch, AFSC)

Species	Area/Stock	New Animals	Total Catalogued	Contact Person/Institute
Killer whale, *Orcinus orca*	SE Alaska Central AK & Aleutians, AK	N/A N/A	10 groups 15 groups	M. Dahlheim, AFSC P. Wade, AFSC
Humpback whale, *Megaptera novaeangliae*	Central AK & Aleutians	N/A	46 individuals	P. Wade, AFSC
Fin whale, *B. physalus*	Kodiak, AK	N/A	19 individuals	P. Wade, AFSC
Gray whale, *Eschrichtius robustus*	NW Washington, Vancouver Is./Eastern North Pacific	N/A	159 individuals	M. Gosho, AFSC
Sperm whales, *P. macrocephalus*	Aleutians	N/A	8 individuals	P. Wade, AFSC

3.2. Telemetry Data (satellite and radio tags) for Calendar Year 2002.

AFSC

Species	Area/Stock	Tag Type	No. Deployed	Contact Person/Institute
Beluga whale	Cook Inlet	Long term location Short-term dive/location	8 10	R. Hobbs, AFSC

Harbor porpoise tagging
In late September – early October 2002, eight harbor porpoises were captured with a large mesh gillnet from a small vessel near the Sekiu River, Olympic Peninsula, Washington State. All eight (one subadult male, four subadult females, and an adult male, and two adult females) were released unharmed with a pair of streamlined satellite-linked (PTT)/VHF tags pinned to their dorsal fin for long-term monitoring. In addition, one of the porpoises had a suction-cup attached TDR/VHF radio attached for short-term collection of dive and velocity data although it was not recovered. The same general movement pattern observed with the four porpoises tagged in 2001 was observed in 2002. The porpoises generally remained in the vicinity of the capture location for several weeks before moving out of the local area. Some of the porpoises then moved to the west, near Swiftsure Bank, while the others moved to the east in the central Strait of Juan de Fuca. Locations were obtained from one to five months for seven of the porpoises, with signals still being received to date (mid April) for one porpoise. During these monitoring periods the

porpoises have generally remained in the central region of the Strait of Juan de Fuca. (Contact: B. Hanson, NWFSC).

4. TISSUE/BIOLOGICAL SAMPLES COLLECTED

4.1. Biopsy Samples for Calendar Year 2002

NWFSC and AFSC

Species	Area/Stock(s)	No. Samples	Contact Person/Institution
Beluga, *Delphinapterus leucas*	Cook Inlet, Alaska Bering Sea; Kodiak, AK	810	Barb Mahoney, AK NMFS R. Hobbs, AFSC
Dall's porpoise, *Phocoenoides dalli*	Bering Sea, Alaska	2	Paul Wade, NMML
Fin whale, *Balaenoptera physalus*	Gulf of Alaska	5	Paul Wade, AFSC
Gray whale, *Eschrichtius robustus*	Eastern No. Pacific	1	M. Gosho, AFSC
Humpback whale, *Megaptera novaeangliae*	Bering Sea, Gulf of Alaska	11	Paul Wade, AFSC
Killer whale, *Orcinus orca*	Northern Resident, North Pacific	1 (blood)	Brent Norberg, NWR
Killer whale *Orcinus orca*,	Bering Sea, North Pacific	34	Paul Wade, NMML
Killer whale, *Orcinus orca*	Prince William Sound, Bering Sea, North Pacific	38	Craig Matkin, North Gulf Oeanic Society
Killer whale, *Orcinus orca*	SE Alaska Central AK and Aleutians	710	M. Dahlheim, AFSC Paul Wade, AFSC
Killer whale *Orcinus orca*,	Russia	8	Vladimar Burkanov and Marilyn Dahlheim, NMML
Sperm whale, *Physeter macrocephalus*	Aleutians	8	Paul Wade, AFSC

SWFSC

Species	Area/Stock(s)	No. Samples	Contact Person/Institution S. Chivers, SWFSC
Baird's beaked whale, *Berardius bairdii*	California/Oregon/Washington	5	
Blue whale, *Balaenoptera musculus*	Eastern North Pacific	2	
Bottlenose dolphin, *Tursiops truncatus*	California/Oregon/Washington	1	
Bottlenose dolphin, *Tursiops truncatus*	Hawaiian	12	
Byrde's whale, *Balaenoptera edeni*	Hawaiian	6	
Fin whale, *Balaenoptera physalus*	Hawaiian	3	
Fin whale, *Balaenoptera physalus*	California/Oregon/Washington	4	
Fraser's dolphin, *Lagenodelphis hosei*	Hawaiian Stock	4	
Humpback whale, *Megaptera novaengliae*	Eastern North Pacific	8	
Humpback whale, *Megaptera novaengliae*	Eastern North Pacific	76	
Killer whale, *Orcinus orca*	West Coast Transient	1	
Killer whale, *Orcinus orca*	Hawaiian	5	
Killer whale, *Orcinus orca*	Gulf of Alaska Transient	7	

Species	Area/Stock(s)	No. Samples	Contact Person/Institution S. Chivers, SWFSC
Killer whale, *Orcinus orca*	Northern Resident	9	
Long-beaked common dolphin, *Delphinus capensis*	California/Oregon/Washington	6	
Minke whale, *Balaenoptera acutorostrata*	Hawaiian	1	
North Pacific right whale, *Eubalaena japonica*	North Pacific	9	
Pacific white-sided dolphin, *Lagenorynchus obliquidens*	California/Oregon/Washington	4	
Pantropical spotted dolphin, *Stenella attenuata*	Hawaiian	7	
Risso's dolphin, *Grampus griseus*	California/Oregon/Washington	1	
Rough-toothed dolphin, *Steno bredanensis*	Hawaiian	6	
Sei whale, *Balaenoptera borealis*	Eastern North Pacific	8	
Short-beaked common dolphin, *Delphinus delphis*	California/Oregon/Washington	39	
Short-finned pilot whale, *Globicephala macrorhynchus*	Hawaiian	44	
Sperm whale, *Physeter macrocephalus*	Hawaiian	19	
Sperm whale, *Physeter macrocephalus*	California/Oregon/Washington	3	
Unidentified common dolphin, *Delphinus* sp	California/Oregon/Washington	14	
Whitebelly spinner dolphin, *Stenella longirostris*	Hawaiian	17	

4.2. Samples From Directed Catches or Bycatches for Calendar Year 2002

AFSC

Species	Area/Stock(s)	Number	Contact Person/Institute
Beluga, *Delphinapterus leucas*	Bristol Bay, Alaska	1	Barb Mahoney, AK NMFS
Bowhead whale, *Balaena mysticetus*	Alaska	45 (from 15 animals)	Todd O'Hara, North Slope Borough
Gray whale, *Eschrichtius robustus*	Russia, Eastern North Pacific	18 blubber and 14 liver	Teri Rowles, OPR and Todd O'Hara, North Slope Borough

4.3. Samples From Stranded Animals for the Calendar Year 2002.

NWFSC/AFSC

Species	Area/Stock(s)	No. Samples	Contact Person/Institute
Baird's beaked whale, *Berardius bairdii*	Washington, Eastern North Pacific	1	Brent Norberg, NMFS-NW Region (NWR) and John Calambokidis, Cascadia Research Collective
Beluga, *Delphinapterus leucas*	Alaska	6	Barb Mahoney, NMFS Alaska

Species	Area/Stock(s)	No. Samples	Contact Person/Institute
			Region (AR)
Common dolphin, *Delphinus delphis*	California	1	Michelle Hunter, Cascadia Research Collective
Dall's porpoise, *Phocoenoides dalli*	California	1	Frances Gulland, The Marine Mammal Center
Fin whale, *Balaenoptera physalus*	NE Pacific	1	Brent Norberg, NMFS-NWR
Harbor porpoise, *Phocoena phocoena*	Alaska	1	Barb Mahoney, NMFS-AR
Harbor porpoise, *Phocoena phocoena*	Central California Coast	2	Frances Gulland, The Marine Mammal Center
Killer whale, *Orcinus orca*	California transient, North Pacific	1	Brent Norberg, NMFS-NWR
Killer whale, *Orcinus orca*	Southern resident, North Pacific	1	Brent Norberg, NMFS-NWR

SWFSC

Species Name	Area/Stock	No. Samples	Contact Person/ Institution
Long-beaked common dolphin, *Delphinus capensis*	California	5	S. Chivers, SWFSC
Short-beaked common dolphin, *Delphinus delphis*	California/Oregon/Washington	2	
Bottlenose dolphin, *Tursiops truncatus*	California/Oregon/Washington	2	
Risso's dolphin, *Grampus griseus*	California/Oregon/Washington	2	
Northern right whale dolphin, *Lissodelphis borealis*	California/Oregon/Washington	1	
Cuvier's beaked whale, *Ziphius cavirostris*	California/Oregon/Washington	1	
Gray whale, *Eschrictius robustus*	Eastern North Pacific	1	
Blue whale, *Balaenoptera musculus*	Eastern North Pacific	1	

4.4 Samples From Incidental Catch for Calendar Year 2002

SWFSC

Species	Observed Incidental Kill	Specimens with minimum data collected [a]	Specimens with full life history data collected [b]
Common dolphin, *Delphinus delphis*	10	10	9
Long-beaked common dolphin, *Delphinus capensis*	3	3	3
Pacific white-sided dolphin, *Lagenorhynchus obliquidens*	1	1	1
No. right whale dolphin, *Lissodelphis borealis*	3	3	3
TOTAL	17	17	16

[a] species identification and total body length, and/or a skin sample were collected

b species identification, gender, total body length, teeth, gonads and skin samples were collected

Estimated mortality of marine mammals incidentally caught in the California halibut/angel shark set gillnet and swordfish/thresher shark drift gillnet fisheries is estimated for calendar year 2002 are presented in SC/55/SM3. Observed bycatch in the drift gillnet fishery is documented by NMFS biological technicians that accompany 20-25% of all fishing trips, and in 2002 observer coverage was 20% (360 days observed/1,779 estimated days fished). The observed incidental take of cetaceans and the number of cetaceans with biological samples collected is summarized in the table above by species. (Contact: S. Chivers, SWFSC).

5. POLLUTION STUDIES

NWFSC

Gray Whales
In 1999 and 2000, more than 600 gray whales stranded along the west coast of North America, which was an increase of approximately six times the annual number of animals that stranded between 1995 – 1998. Several factors may have contributed to the increased number of gray whale stranding events including reduced prey quality or quantity, infectious diseases, ship strikes or exposure to biotoxins or anthropogenic contaminants. In addition , Russian subsistence hunters have reported that some gray whales were skinny and that the tissues of freshly harvested whales were malodorous. The "skinny whale" syndrome may be related to reduced prey quality or quantity; however, the cause of "stinky whale" syndrome is unknown. Liver and full-thickness blubber samples of gray whales collected by Russian subsistence hunters in 2001 were compared to samples from the 1994 Russian subsistance harvest (presumably healthy animals) and to samples from stranded and free-ranging gray whales from Washington and Puget Sound waters. Organic chloride (OC) concentrations were comparable between 1994 and 2001 Russian harvested whales but were lower than levels found in stranded animals. Lipid concentrations of blubber were similar between 1994 and 2001 Russian harvested whales and were higher than those from samples of stranded or free-ranging gray whales. (Contact G. Ylitalo, NWFSC).

To determine if there are differences in lipid composition and OC levels in the blubber of gray whales based on depth within the blubber, each full-thickness blubber sample was subsampled every 3 cm from the epidermis. In most cases, the inner blubber samples had lower levels of OCs and percent lipids than did the outer or middle depth blubber samples. (Contact G. Ylitalo, NWFSC).

Killer Whales
Potential factors that may be contributing to the suspected decline of southern resident killer whales that live in waters of Puget Sound during May through October include reduced food quality or quantity, exposure to high levels of toxic contaminants (e.g., organochlorines) and whale watching disturbances. The ratios of DDTs:PCBs for 36 whole chinook salmon were compared to the ratios determined for other potential killer whale prey previously analyzed. In addition, blubber biopsy samples (n = 26) of free-ranging killer whales from the Eastern North Pacific were analyzed for OCs and lipids. Toxic PCB congeners were measured, as well as additional OCs (e.g., β-HCH, chlordane) to provide information on the profiles and levels of toxic environmental contaminants. (Contact G. Ylitalo, NWFSC).

Full-thickness blubber samples of a transient reproductive female that stranded near Dungeness Spit, WA in January 2002 and a resident reproductive female whale that stranded off the Washington Coast in April 2002 were analyzed for OCs and lipid concentrations. These data provided information on the stratification of contaminants and lipid classes based on blubber depth as well as blubber site (e.g., dorsal, lateral) in killer whales (SC/55/E3). (Contact P. Krahn, NWFSC).

6. STATISTICS FOR LARGE CETACEANS

6.1. Direct Catches (Commercial, Aboriginal and Scientific Permits) for Calendar year 2002

None reported

6.2. Incidental Catches for Calendar year 2000

AFSC

Species Name	Area/Stock	Reported	Est. Total	Fishery Type
Minke whale, *Balaenoptera acutorostrata*	Bering Sea	1	2	groundfish trawl fishery
Sperm whale, *Physeter macrocephalus*	Gulf of Alaska	0.0417	3	groundfish longline fishery

[a] This whale was caught in longline gear lines and was not hooked. It was released alive with trailing gear which is considered a serious injury.

7. STATISTICS FOR SMALL CETACEANS (Not Strandings - unless cause of death can be attributed to direct or incidental capture)

7.1. Direct Catches (Commercial, Aboriginal and Scientific Permits).

Western Alaska beluga whale harvest information for 1997-2001. Totals for each stock show only the high end of estimated harvest ranges. Data provided by the Alaska Beluga Whale Committee (ABWC). ND = No Data.

Area/Stock	LANDED	STRUCK & LOST	TOTAL
2001			
Beaufort Sea	25	18	43
Chukchi Sea	84	5	89
Eastern Bering Sea	281	28	309
Kuskokwim	0	ND	0
Bristol Bay	22	ND	22
2000			
Beaufort Sea	16	ND	16
Chukchi Sea	2	3	5
Eastern Bering Sea	188	24	212
Kuskokwim	0	ND	0
Bristol Bay	6	1	7

7.2. Incidental Catches For The Calendar Year 2000

SWFSC

Species	Area/Stock	Incidental Mortality		
		Reported	Est. Total	Fishery type
Short-beaked common dolphin, *Delphinus delphis*	California/Oregon/ Washington	23[1]	75	Swordfish/thresher shark drift gillnet fishery
Long-beaked common dolphin, *Delphinus capensis*	California	2[1]	9	Swordfish/thresher shark drift gillnet fishery
Unidentified Common Dolphin	California	un-observed fishery	3	California angel shark/halibut and other species large mesh (>3.5") set gillnet fishery

Species	Area/Stock	Incidental Mortality		
		Reported	Est. Total	Fishery type
Northern right whale dolphin , *Lissodelphis borealis*	California/Oregon/ Washington	11[1]	47	Swordfish/thresher shark drift gillnet fishery
Harbor porpoise,*Phocoena phocoena*	Central California	7[1]	26	California angel shark/halibut and other species large mesh (>3.5") set gillnet fishery
Risso's dolphin, *Grampus griseus*	California	2[1]	7	Swordfish/thresher shark drift gillnet fishery
Pacific white-sided dolphin, *Lagenorhynchus obliquidens*	California	2[1]	5	Swordfish/thresher shark drift gillnet fishery

[1]Carretta, J.V. 2001. Preliminary estimates of cetacean mortality in California gillnet fisheries for 2000. Rept. Int. Whal. Comm., Scientific Committee document SC/53/SM9. 21 p. [Available from Southwest Fisheries Science Center, 8604 La Jolla Shores Dr., La Jolla, CA 92037, USA].

8. OTHER STUDIES AND ANALYSES

AFSC

Ecosystem studies

An Eastern Bering Sea Ecopath/Ecosim model (described in SC/54/E1) is being linked to two additional Ecopath/Ecosim models: one of the Gulf of Alaska continental shelf region from 144ºW to 170ºW and one of the Aleutian Islands west of 170º. Linking these three models will allow migratory species, such as cetaceans, to be more accurately modeled. In addition, sub-models are being designed to examine the different oceanographic regions within the individual models, e.g., within the Eastern Bering Sea model the Coastal, Middle Shelf, and Outer Shelf hydrographic domains will be modeled. For the Eastern Bering Sea model, sensitivity analyses are being performed to explore the effects of different parameter values (e.g., the vulnerability parameter), uncertainty in the input data (e.g., biomass estimates and diet composition), and the effect of different model assumptions (e.g., how competition between different species groupings is modeled). (Contact: N. Friday, AFSC).

NWFSC

Review of Southern Resident killer whales status under the U.S. Endangered Species Act

The status review was conducted in 2001 and 2002. The results of the review, including recommendations for needed research projects, was published (P. Krahn *et al.* 2002)(Contact P. Krahn, NWFSC).

Feeding Ecology

Blubber samples collected in 2001 from Cook Inlet belugas from harvested animals and by biopsy were and analyzed ifor fatty acids using GC/MS, In addition, seven potential prey species believed to be a significant part of the diet for these whales were also collected from Cook Inlet in 2001 and analyzed for their whole-body fatty acid composition. Quantitative fatty acid signature analysis (QFASA) was used to infer the relative importance of the seven postulated prey species to the diet of the Cook Inlet belugas. From these data, provisional estimates of the relative biomass (wet weight) of whole-body prey consumed by these cetaceans have been computed (Contact P. Krahn, NWFSC).

SWFSC

Tuna-Dolphin Studies

Studies of whether chase and encirclement of dolphins by tuna purse seiners were conducted in 2002. The research falls under four categories: abundance estimates for depleted dolphin stocks, ecosystem studies, stress and other possible fishery effects, and quantitative stock assessments of depleted dolphins. This research produced three substantial new results: (1) current estimates of abundance for depleted dolphin stocks as well as for other cetaceans in the Eastern Tropical Pacific (ETP), with advances in analytic methods for abundance estimation; (2) sharpening the focus on likely mechanisms of stress effects on individual dolphins; and (3) an improved understanding of the likely effects of chase and encirclement on the cow-calf bond. Overall conclusions of the research were that both northeastern offshore spotted dolphins and eastern spinner dolphins are significantly below their pre-fishery levels and that neither population is recovering at a rate that would be expected based on these current levels of depletion. (See reports on http://swfsc.nmfs.noaa.gov/IDCPA/TunaDol_rep/). (Contact: S. Rielly, SWFSC).

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