

USA Progress Report on Cetacean Research - May 2001 to April 2002 With Statistical Data for Calendar Year 1999

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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 (NWFS) 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	<i>Stenella frontalis</i>	No. Gulf of Mexico	2, 4, 8
Atlantic white-sided dolphin	<i>Lagenorhynchus acutus</i>	western N. Atlantic	2, 7
Beaked whale	<i>Mesoplodon sp.</i>	western N. Atlantic, Gulf of Mexico	10
Bottlenose dolphin	<i>Tursiops truncatus</i>	western N. Atlantic, Florida, Gulf of Mexico	2, 3, 4, 7, 8, 9, 10
Clymene dolphin	<i>S. clymene</i>	No. Gulf of Mexico	4
Common dolphin	<i>Delphinus delphis</i>	western N. Atlantic	2, 7
Fin whale	<i>B. physalus</i>	western N. Atlantic	2, 4, 6, 8
Harbor porpoise	<i>Phocoena phocoena</i>	western N. Atlantic	2, 7
Humpback whale	<i>Megaptera novaeangliae</i>	western N. Atlantic	2, 6
Melon-headed whale	<i>Peponocephala electra</i>	Gulf of Mexico	4
Minke whale	<i>B. acutorostrata</i>	western N. Atlantic	2, 4, 6, 8
Pantropical spotted dolphin	<i>Stenella attenuata</i>	western N. Atlantic, Gulf of Mexico	2, 4, 8

Common Name	Scientific Name	Area/Stock(s)	Referred to in Section(s):
Pilot whale	<i>Globicephala sp.</i>	western N. Atlantic, Gulf of Mexico	2, 4, 7, 8
No. Right whale	<i>Balaena glacialis</i>	western N. Atlantic	2, 3, 4, 6, 8
Risso's dolphin	<i>Grampus griseus</i>	western N. Atlantic, Gulf of Mexico	7
Rough-toothed dolphin	<i>Steno bredanensis</i>	Florida, Gulf of Mexico	2, 4
Sperm whale	<i>Physeter macrocephalus</i>	western N. Atlantic, Gulf of Mexico	2, 3, 4, 8, 10
Spinner dolphin	<i>S. longirostris</i>	Gulf of Mexico	4
Striped dolphin	<i>S. coeruleoalba</i>	western N. Atlantic, Gulf of Mexico	4

2. SIGHTINGS DATA 2001

2.1 Field Work

NEFSC

Shipboard surveys

16 July - 3 August, 2001. Marine Mammal Survey Calibration Study aboard FRV Delaware II and NOAA Twin Otter aircraft.

The study area was from Boothbay Harbor, Maine, north to Grand Manan Island, Nova Scotia, and east to near Digby, Nova Scotia. The primary goal was to evaluate the *FRV DELAWARE II* as a platform to conduct future line transect abundance surveys (see Section 8). Two independent sighting teams surveyed approximately 1200 nautical miles over a period of 16 days. There were eight species of identifiable cetaceans seen during the survey - fin, sei, pilot, minke, right, and humpback whales, white-sided dolphins, and harbor porpoises (Contact: D. Palka, NEFSC).

23 July - 3 August, 2001. Northern Right Whale Habitat Study aboard FRV Albatross IV.

The study area encompassed the offshore waters from Wilkinson Basin to the Bay of Fundy. The primary objectives of the cruise were to conduct oceanographic sampling in areas of right whale habitat and to assess the feasibility of methods for several ECOHAB studies (Ecology and Oceanography of Harmful Algal Blooms, NOAA Coastal Oceans Program) (see Section 8). During 16 hours and five minutes of observation, a total of 512 sightings were recorded, of which 499 were right whales. The vast majority of the right whale sightings, however, were undoubtedly repeated sightings of the same individuals during consecutive 15 minute scans. The other marine mammal sightings included one sighting of a fin/sei whale, one of a fin whale, one of a minke, and eight sightings of harbor porpoise (18 individuals total). No photographs or biopsy samples of marine mammals were taken during this cruise. (Contact: T. Cole or P. Clapham, NEFSC).

Aerial Surveys

Right Whale Photogrammetry - August 8 - 30, 2001. The first NW Atlantic right whale aerial photogrammetry survey was conducted aboard the NOAA DeHavilland Twin Otter aircraft during August 8-30, 2001. Camera systems with forward image motion compensation were used to record images of right whales, including some mother/calf pairs, while congregated in the summer feeding grounds in the waters of the Bay of Fundy and the Gulf of Maine. Data was collected during 9 flight days within the survey time period. Approximately 5400 photographs of 87 individuals were taken with many of sufficient quality to allow total length, fluke width and girth measurements (Contact: D. Potter, NEFSC or W. Perryman, SWFSC).

Northeast Right Whale Sighting Advisory System (SAS)

The Northeast Right Whale Sighting Advisory System (SAS) was established to document locations of right whales via aerial and ship surveys and to provide sighting locations, near real time, to the maritime industry to help reduce the likelihood of vessel collisions with right whales. Sighting information was disseminated by various

media (fax, email, NAVTEX, broadcasts, web sites) and sources (Coast Guard, National Weather Service, shipping agents, pilots, dispatchers, port authorities, Mandatory Ship Reporting System, etc.). Detailed information about the Right Whale Sighting Advisory System can be found at <http://www.nefsc.nmfs.gov/cgi-bin/rwhale.pl>

Right whale aerial surveys were flown in the Cape Cod Bay and Great South Channel Right Whale Critical Habitats off Massachusetts and other offshore areas from January through mid-July 2001. Great South Channel and offshore surveys (late March to mid-July) completed a total of 51 flights covering almost 15,000 nautical miles in 294 flight hours. Observer sightings totaled 508 right whales, including 32 sightings of mother and calf pairs, one entangled right whale and one right whale that was known to have been entangled previously but was now not entangled. The Cape Cod Bay surveys (January to mid-May) were conducted by the Center for Coastal Studies (CCS) under contract to the state of Massachusetts and completed 32 flights in Cape Cod Bay and adjacent waters.

Approximately 9,000 nautical miles in 118 flight hours were completed with a total of 545 right whale sightings, including seven mother and calf pairs, and one entangled right whale (Contact: P. Gerrior, NER).

An additional aerial team surveyed systematic transect lines in waters from eastern Long Island east to the Hague Line, and from the New York shipping lanes and the southern edge of Georges Bank north to the entrance of Penobscot Bay. From late March to mid-July, a series of 13 transect lines spaced 20 nautical miles apart was completed twice in 12 flights. On four 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 80 hours and recorded 73 sightings of right whales (Contact: T. Cole, NEFSC).

SEFSC

Shipboard Surveys

Gulf of Mexico

From 17 April to 31 May 2001, a visual line-transect survey was conducted throughout oceanic and continental slope waters of the U.S. Gulf of Mexico aboard NOAA Ship *Gordon Gunter*. During 44 survey days, 4094 transect km were surveyed, resulting in 175 cetacean sightings of at least 18 species. The most commonly sighted species were pantropical spotted dolphins (43 sightings), sperm whales (27 sightings), and dwarf/pygmy sperm whales (20 sightings). Observations were recorded on the prevalence of bite wounds from cookie-cutter sharks (*Isistius* spp.) and presence of remoras on cetaceans. Fifteen biopsy samples, representing six cetacean species, were obtained from animals riding at the bow of the *Gordon Gunter* and from small boats. The skin and blubber samples were sent to the NOS Charleston (South Carolina) Laboratory for analysis and storage. (Contact: K. Mullin, SEFSC).

A visual line-transect survey was conducted throughout outer continental shelf (>10 m) and upper continental slope waters of the U.S. Gulf of Mexico aboard NOAA Ship *Gordon Gunter* from 28 August to 29 September 2001. During 25 survey days, 2794 transect km were surveyed, resulting in 225 cetacean sightings of at least five species as follows: bottlenose dolphin (104 sightings), Atlantic spotted dolphin (58 sightings), pantropical spotted dolphin (5 sightings), sperm whale (5 sightings) and rough-toothed dolphin (2 sightings). Observations were recorded on the prevalence of bite wounds from cookie-cutter sharks (*Isistius* spp.) and presence of remoras on cetaceans. Fifteen biopsy samples, representing three cetacean species, were obtained from animals riding at the bow of the *Gordon Gunter* and from small boats. The skin and blubber samples were sent to the NOS Charleston (South Carolina) Laboratory for analysis and storage. (Contact: K. Mullin, SEFSC).

Southwestern Atlantic

A marine mammal assessment survey was conducted on the Atlantic continental shelf ranging from Cape Canaveral, FL to Delaware Bay from 6 February to 9 April aboard the NOAA ship *Gordon Gunter*. The survey effort concentrated on water depths from 0-200 m, but included areas of the inner continental slope north of Cape Hatteras, NC. The primary species sighted include Atlantic spotted dolphins, Atlantic bottlenose dolphins, fin whales, and sperm whales. In addition to visual line transect survey efforts, the survey employed passive hydroacoustic methods for detection of vocalizing marine mammals. These efforts employed primarily a towed hydrophone array and limited deployment of directional sonobuoys. (Contact: L. Garrison, SEFSC)

Aerial Surveys

From 15 January to 28 February 2002, an aerial survey was conducted on the continental shelf from southern Georgia to Delaware Bay. The primary goal of the survey was assessment of coastal bottlenose dolphin in water depths between 0-40m. A total of 6,991 km of trackline were flown on effort. There were 213 bottlenose dolphin groups sighted for a total of 2,484 animals. In addition, 23 groups (537 animals) of Atlantic spotted dolphins, 4 humpback whales, 5 groups (12 animals) of fin whales, and a mother-calf pair of North Atlantic right whales were encountered during the survey. (Contact: L. Garrison, SEFSC)

2.2. Analyses/Development of Techniques

NEFSC

A Marine Mammal Survey Calibration Study was conducted aboard *FRV DELAWARE II* and NOAA Twin Otter aircraft from 16 July to 3 August, 2001 in a study area from Boothbay Harbor, Maine, north to Grand Manan Island, Nova Scotia, and east to near Digby, Nova Scotia. The primary goal was to evaluate the *FRV DELAWARE II* as a platform to conduct future line transect abundance surveys by comparing abundance results from data collected by a shipboard and aerial survey that was conducted simultaneously. A secondary goal was to evaluate the *FRV DELAWARE II* for use in acoustic surveys. The ship and plane surveyed the same set of track lines (approximately 1200 nautical miles) on the same day. The plane (at a speed of 100 knots) surveyed those track lines 3 or 4 times while the ship (at a speed of 10 knots) surveyed them once. Preliminary results suggest that the *FRV DELAWARE II* can provide a useful platform for acoustic surveys both in coastal waters, preferably at medium speeds, and in deep waters at full speed (Contact: D. Palka, NEFSC).

The Northern Right Whale Habitat Study was conducted aboard *FRV ALBATROSS IV* from 23 July to 3 August, 2001 in a study area that encompassed the offshore waters from Wilkinson Basin to the Bay of Fundy. The primary objectives of the cruise were to conduct oceanographic sampling in areas of right whale habitat and to assess the feasibility of methods for several ECOHAB studies (Ecology and Oceanography of Harmful Algal Blooms, NOAA Coastal Oceans Program). Specific research activities included: (1) paired Optical Plankton Counter (OPC) casts and depth-stratified Multiple Opening and Closing Net Environment Sampling System (MOCNESS) tows in regions of high *Calanus finmarchicus* abundance to calibrate the OPC; (2) OPC casts and MOCNESS tows while on station to track diel vertical migration of *C. finmarchicus*; (3) OPC casts (grid with 5 nmi spacings) for a snapshot of *C. finmarchicus* distribution in the lower Bay of Fundy; (4) *Alexandrium* distribution mapping; (5) live *C. finmarchicus* and *Alexandrium* specimen collection for studies on grazing rates of the former on the latter; and (6) *C. finmarchicus* specimen collection for studies on toxin concentrations, lipid condition, and carbon and nitrogen content (Contact: T. Cole or P. Clapham, NEFSC).

3. MARKING DATA

3.1. Field work

Natural Marking Data for Calendar Year 2001

NEFSC

Species	Area/Stock	New Animals ID'd	Total cataloged	Contact Person/Institute
No. Atl. right whales, <i>Eubalaena glacialis</i>	Bay of Fundy, Roseway and Grand Manan Basins	N/A N/A	30 87	T. Cole, NEFSC D. Potter, NEFSC or W. Perryman, SWFSC

SEFSC

Species	Area/Stock	New Animals ID'd	Total cataloged	Contact Person/Institute
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Bottlenose dolphins, <i>Tursiops truncatus</i>	Mississippi Sound	15	809	K. Mullin, SEFSC
Killer whale <i>Orcinus orca</i>	Gulf of Mexico	1	47	
Sperm whale <i>Physeter macrocephalus</i>	Gulf of Mexico	55	94	

3.2. Telemetry Data (satellite radio, Time Depth Recorder (TDR tags)) for Calendar Year 2001.

NEFSC

Species	Area/Stock	Tag Type	No. Deployed	Contact Person/Institute
No. Atl. right whale <i>Eubalaena glacialis</i>	Grand Manan Basin	TDRs (suction cup)	23	T. Cole, NEFSC
No. Atl. right whale <i>Eubalaena glacialis</i>	Roseway Basin	TDRs (suction cup)	2	

SEFSC

Species	Area/Stock	Tag Type	No. Deployed	Contact Person/Institute
Sperm whale <i>Physeter macrocephalus</i>	Gulf of Mexico	Digital Acoustic Tag (DTAG)	13	Keith Mullin, SEFSC
Sperm whale <i>Physeter macrocephalus</i>	Gulf of Mexico	Satellite	4	

4. TISSUE/BIOLOGICAL SAMPLES COLLECTED

4.1. Biopsy Samples for Calendar Year 2001

NEFSC

Species	Area/Stock	No. Collected	Contact Person/Institute
No. Atl. right whales, <i>Eubalaena glacialis</i>	Roseway Basin	2	T. Cole, NEFSC
Pilot whale, <i>Globicephala sp.</i>	Roseway Basin	1	
*Fin whale, <i>Balaenoptera physalus</i>	Maine/Bay of Fundy	1	D. Palka, NEFSC

*A biopsy was taken of a dead fin whale found floating during the July-August 2001 Marine Mammal Calibration Study Survey.

SEFSC

Species	Area/Stock	No. Collected	Contact Person/Institute
			Keith Mullin, SEFSC

Species	Area/Stock	No. Collected	Contact Person/Institute Keith Mullin, SEFSC
Bottlenose dolphin (<i>Tursiops truncatus</i>)	Gulf of Mexico (Outer Continental Shelf)	22	
Bottlenose dolphin (<i>Tursiops truncatus</i>)	Atlantic (offshore and inshore)	186	
Minke whale (<i>Balaenoptera acutorostrata</i>)	Atlantic	1	
Fin whale (<i>Balaenoptera physalus</i>)	Atlantic	1	
Sperm whale (<i>Physeter macrocephalus</i>)	Gulf of Mexico	65	
Sperm whale (<i>Physeter macrocephalus</i>)	Atlantic	1	
Melon-headed whale (<i>Peponocephala electra</i>)	Gulf of Mexico	6	
Pilot whale (<i>Globicephala macrorhynchus</i>)	Gulf of Mexico	3	
False killer whale (<i>Pseudorca crassidens</i>)	Gulf of Mexico	1	
Killer whale (<i>Orcinus orca</i>)	Gulf of Mexico	2	
Rough-toothed dolphin (<i>Steno bredanensis</i>)	Gulf of Mexico	3	
Atlantic spotted dolphin (<i>Stenella frontalis</i>)	Gulf of Mexico	33	
Atlantic spotted dolphin (<i>Stenella frontalis</i>)	Atlantic	60	
Pantropical spotted dolphin (<i>Stenella attenuata</i>)	Gulf of Mexico	4	
Spinner dolphin (<i>Stenella longirostris</i>)	Gulf of Mexico	2	
Spinner dolphin (<i>Stenella longirostris</i>)	Atlantic	1	
Striped dolphin (<i>Stenella coeruleoalba</i>)	Gulf of Mexico	3	
Clymene dolphin (<i>Stenella clymene</i>)	Gulf of Mexico	2	
No. right whale (<i>Eubalaena glacialis</i>)	Atlantic	1	

5. POLLUTION STUDIES

None reported

6. STATISTICS FOR LARGE CETACEANS

Other Non-Natural (e.g., Ship Strike, Entanglement) Mortalities For The Calendar Year 1999 as Reported in Waring *et al.* 2001.

NEFSC and SEFSC

Species	Area/Stock	Sex	Cause
No. Atlantic right whale, <i>Eubalaena glacialis</i>	Cape Cod, MA	F	ship strike

Species	Area/Stock	Sex	Cause
	Cape Cod, MA	F	fishery interaction/ entanglement
Humpback whale, <i>Megaptera novaeangliae</i>	Gulf of Maine	M	fishery interaction/ entanglement
Minke whale, <i>Balaenoptera acutorostrata</i>	Cape Lookout, NC Orleans, MA Sakonnet River, RI Pt. Judith Light, RI Provincetown, MA	F F N/A N/A F	fishery interaction/ entanglement
Fin whale, <i>Balaenoptera physalus</i>	Virginia Beach, VA Elizabeth, NJ	M M	ship strike

7. STATISTICS FOR SMALL CETACEANS

Incidental Mortalities For The Calendar Year 1999 as Reported in Waring *et al.* 2001.

NEFSC and SEFSC

Species	Area/Stock	Incidental Mortality		
		Reported	Est. Total	Fishery type
Bottlenose dolphin, <i>Tursiops truncatus</i> , coastal stock	Mid-Atlantic Central Florida	3 4	63 52	Mid-Atl. coastal sink gillnet Florida shark gillnet ¹
Common dolphin, <i>Delphinus delphis</i>	NW Atlantic NW and Mid-Atlantic Mid-Atlantic	2 1	146 49	NE multispecies sink gillnet Squid, mack, butt. trawl
Harbor porpoise, <i>Phocoena phocoena</i>	NW Atlantic Mid-Atlantic NW and Mid-Atlantic	14 3 19	270 53 19	NE multispecies sink gillnet Mid-Atl. coastal sink gillnet NMFS/NER records (gillnet) ²
Pilot whales, <i>Globicephala</i> sp.	NW Atlantic NW and Mid-Atlantic Mid-Atlantic	1 1 1	228 49 94	N. Atlantic bottom trawl Squid, mack., butt. trawl Pelagic longline ¹
Risso's dolphin, <i>Grampus griseus</i>	NW and Mid-Atlantic Mid-Atlantic	1	22	Pelagic longline (serious injury)
White-sided dolphin, <i>Lagenorhynchus acutus</i>	NW Atlantic	4	69	NE multispecies sink gillnet

¹ Incidental mortalities for calendar year 1999 as reported in Yeung *et al.* 2001 and Garrison 2001.

² Subsequent review of NMFS/NER stranding records found sufficient information to confirm the cause of death as fishery interaction/entanglement.

8. OTHER STUDIES AND ANALYSES

NEFSC

During 7 - 31 August, 2001, the Northern Right Whale Tagging Survey was conducted aboard *FRV DELAWARE II*.

The study area encompassed the offshore waters from Wilkinson Basin to the Bay of Fundy, and over Roseway Basin on the Scotian Shelf. The ship was also available to assist in any right whale disentanglement efforts.

Operations during this cruise were coordinated with concurrent NEFSC aerial surveys, as well as projects being

conducted by the Canadian Department of Fisheries and Oceans (DFO), the New England Aquarium (NEAq) and the Woods Hole Oceanographic Institution (WHOI). Twenty five right whales were tagged with non-invasive, suction cup Time and Depth Recorders (TDRs) in Grand Manan Basin and over Roseway Basin. Nineteen of the tags remained attached for over one hour, three for over ten minutes, and three for less than ten minutes. All tags were recovered following their detachment from the whales. An estimated 30 individual right whales were recorded as photographed during the cruise. Biopsy skin samples were collected from one pilot whale and two right whales on Roseway Basin (Contact: T. Cole or P. Clapham, NEFSC).

Historical Whaling Records

A review of historical data sources for catches of North Atlantic humpback whales in the Gulf of Maine and in the two breeding areas has been conducted. Additional historic sources for Gulf of Maine catches of humpbacks and other species have been identified, and will provide a basis for estimating catches in the 1800s; substantial additional catches have been identified in the 1880-1900 period. A stratified random sample of Yankee whaling logbooks has been examined to determine the numbers of humpbacking voyages in the Cape Verde and West Indies islands in the period 1865-1886 and the average number of whales landing per voyage. Total landings are being estimated based on the known total number of voyages in this period. Additionally, records of humpbacks in the Yankee whaling logbooks from throughout the North Atlantic and from the east coast of Africa are being summarized to determine seasonal and spatial distribution patterns. (Contact: Tim Smith, NEFSC).

Archival sources for Yankee whaling are being reviewed for utility in determining whaling grounds visited by voyages in the 19th century. This is to address the question raised in Bannister *et al.* 1983) about the adequacy of relying only on logbook data to determine the total number of whaling vessels on specific whaling grounds. Other archival sources being investigated include the Dennis Wood Abstracts, the Whalemen's Shipping List, and the Diaz Manuscript. Preliminary indications are that substantially more vessels whaled on the Japan Grounds in the early 1800s than indicated by the logbooks sampled in Bannister *et al.* (1983). (Contact: Tim Smith, NEFSC).

SEFSC

Gulf of Mexico:

From 16 March to 3 April 2001, a study of sperm whales was conducted in the southeastern U.S. Gulf of Mexico. The primary objectives of the study were to tag whales, collect biopsy samples, and obtain fluke photos for individual identification. Sperm whales were located and tracked using 25x binoculars and a five-element acoustic array. Attempts were made to attach digital acoustic tags (DTAG) with suction cups to record depth, sounds, and orientation (e.g., pitch, roll). No DTAGS were successfully attached. Fifteen biopsy samples and 40-50 fluke photos of 10-15 individuals were collected from sperm whales. Other data collected were recordings of nine cetacean species and anthropogenic sound, biopsy samples of six delphinid species, and oceanographic data (e.g., CTD, XBT) (Contact: K. Mullin, SEFSC).

From 17 July to 22 August 2001, a study of sperm whales was conducted in the north-central Gulf of Mexico south of the Mississippi River Delta. The primary objectives of the study were to tag whales, collect biopsy samples, and obtain fluke photos for individual identification. Sperm whales were located and tracked using 25x binoculars and a five-element acoustic array. DTAGS were successfully attached 13 times and a total of 26 hours of data were recorded. Satellite tags were attached to four sperm whales to study movement patterns and one tag returned location data for 135 days. Fifty biopsy samples and 88 fluke photos were collected from sperm whales. Other data collected were recordings of other cetacean species and anthropogenic sound, acoustic line-transect data, biopsy samples of three delphinid species, and oceanographic data (e.g., CTD, XBT) (Contact: K. Mullin, SEFSC).

Mid-Atlantic

From May to December, localized biopsy sampling surveys were conducted between North Carolina and New Jersey. These surveys generally utilized small boats to search for and sample bottlenose dolphins. In addition to biopsy collection, the teams conducted photo-identification work. Since May 2001, these efforts collected 125 biopsies from bottlenose dolphins, 24 biopsies from Atlantic spotted dolphins, and 1 biopsy from a North Atlantic right whale. (Contact: A. Hohn, SEFSC)

Southwestern Atlantic

From 30 July to 31 August 2001, a systematic survey of the near shore continental shelf from Northern Florida to Long Island, NY was conducted using small vessels. The goal of the survey was to collect biopsy samples from Atlantic bottlenose dolphins for genetic analysis to identify habitat boundaries between the coastal and offshore ecotypes. The primary species encountered during the survey were Atlantic bottlenose dolphins and Atlantic spotted dolphin. A total of 1886 Atlantic bottlenose dolphins (172 groups) and 513 Atlantic spotted dolphins (79 groups) were encountered. In addition, 1 group of pantropical spotted dolphins, 2 fin whales and 1 minke whale were encountered. A total of 61 tissue samples were collected from Atlantic bottlenose dolphins, 36 from Atlantic spotted dolphins, and 1 from a fin whale. Biopsy samples are currently housed at the NOS lab in Charleston, SC (Contact: L. Garrison, SEFSC).

9. LITERATURE CITED

- Bannister, J.L., S. Taylor and H. Sutherland. 1983. Logbook records of the 19th Century American sperm whaling: a report on the 12 month project, 1978-1979. Pp. 243-255 in M.F. Tillman and G.P. Donovan (eds.) *Historical Whaling Records*. Rep. Int. Whal. Comm (Special Issue 5).
- Garrison, L.P. 2001. Mortality estimates for Atlantic bottlenose dolphin and protected species interactions with the directed shark gillnet fishery off Florida and Georgia from 1998-2000. Report to the Atlantic Bottlenose Take Reduction Team. NOAA-NMFS Southeast Fisheries Science Center. 75 Virginia Beach Dr., Miami, FL 33149.
- Waring, G.T., J. Quintal and S. Swartz, (eds.) 2001. U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments - 2001. *NOAA Technical Memorandum* NMFS-NE-168. 310p. NOAA-NMFS, Northeast Fisheries Science Center, 166 Water St., Woods Hole, MA 02543, USA.
- Yeung, C. 2001. Estimates of marine mammal and marine turtle bycatch in the U.S. Atlantic pelagic longline fleet in 1999-2000. *NOAA Technical Memorandum* NMFS-SEFSC-467. 43 pp. NOAA-NMFS Southeast Fisheries Science Center. 75 Virginia Beach Dr. Miami, FL 33149.

10. PUBLISHED LITERATURE

10.1. Published or "In press" literature

- Angliss, R.P., G.K. Silber and R. Merrick. 2002. Report of a workshop developing recovery criteria for large whale species. USDOC, NOAA, NMFS, *NOAA Tech. Memorandum* NMFS-F/OPR-21. 32p.
- Baker, C.S. and P.J. Clapham. 2002. Marine Mammal Exploitation: Whales and whaling. Vol. 3, Causes and consequences of global environmental change, p. 446-450, (Ian Douglas, ed.) *In: Encyclopedia of Global Environmental Change*, (T. Munn ed.), John Wiley & Sons, Ltd., Chichester. ISBN 0-471-07796-9.
- Brownell, R.L. Jr., P.J. Clapham, T. Miyashita and T. Kasuya. 2001. Conservation status of North Pacific right whales. *J. Cetacean Res. Manage. (Special Issue) 2*, 269-286.
- Baumgartner, M.F., K.D. Mullin, L.N. May and T.D. Leming. 2001. Cetacean habitats in the northern Gulf of Mexico. *Fishery Bulletin* 99:219-239.
- Clapham, P.J. 2000. The humpback whale: seasonal feeding and breeding in a baleen whale. P.173-196 *In: Mann, J., Tyack, P.L., Connor, R., Whitehead, H., eds. Cetacean Societies*. Chicago, IL: University of Chicago Press.
- Clapham, Phillip. 2001. Why do baleen whales migrate? A response to Corkeron and Connor. *Mar. Mamm. Sci.*, Letters, 17(2):432-436.
- Davis, R.W., J.G. Ortega-Ortiz, C. A. Rubic, W.E. Evans, D.C. Biggs, P.H. Ressler, R.B. Cady, R.R. Leben, K.D. Mullin, and B. Würsig. 2002. Cetacean habitat in the northern oceanic Gulf of Mexico. *Deep-Sea Research I* 49 (2002) 121-142.
- Friday, N., T.D. Smith, P.T. Stevick and J. Allen. 2000. Measurement of photographic quality and individual distinctiveness for the photographic identification of humpback whales, *Megaptera novaeangliae*. *Marine Mammal Science*, 16(2):355-374.
- Hohn, A.A. 2002. Age estimation. Pp 6-13 *in: W.F. Perrin, B. Würsig, and H.G.M. Thewissen. Encyclopedia of Marine Mammals. Academic Press*.
- Hohn, A.A. 2001. Bottlenose dolphin biology and conservation. Review of Reynolds *et al*, The Bottlenose Dolphin. *Ecology* 82(9):2668-2670.
- Kenney, R.D. 2001. Anomalous 1992 spring and summer right whale (*Eubalaena glacialis*) distributions in the Gulf of Maine. *J. Cetacean. Res. Manage. (Special Issue) 2*, 209-223.
- Knowlton, A.R. and S.D. Kraus. 2001. Mortality and serious injury of northern right whales (*Eubalaena glacialis*) in the western North Atlantic Ocean. *J. Cetacean Res. Manage. (Special Issue) 2*, 193-208.
- Kraus, S.D. and J.J. Hatch. 2001. Mating strategies in the North Atlantic right whale (*Eubalaena glacialis*). *J. Cetacean Res. Manage. (Special Issue) 2*, 237-244.
- Kraus, S.D., P.K. Hamilton, R.D. Kenney, A.R. Knowlton and C.K. Slay. 2001. Reproductive parameters of the North Atlantic right whale. *J. Cetacean Res. Manage. (Special Issue) 2*, 231-236.
- Nowacek, Douglas P., Mark P. Johnson, Peter L. Tyack, Kenneth A. Shorter, William A. McLellan, D. Ann Pabst. 2001. Buoyant balaenids: the ups and downs of buoyancy in right whales. *Proc. R. Soc. Lond. B* (2001) 268, 1811-1816.
- Pace, R.M. III. 2000. Radio tracking via triangulation: The folly of censoring locations on the basis of error ellipse size. Pg. 528-534 *In: J.H. Eiler, D.J. Alcorn and M.R. Newman (eds). Biotelemetry 15: Proceedings of the 15th International Symposium on Biotelemetry*. Juneau, AK USA. International Society of Biotelemetry. Wageningen, The Netherlands.

- Pace, Richard M. III. 2001. Estimating and visualizing movement paths from radio-tracking data. P. 189-206 *In: Radio Tracking and Animal Populations*, J.L. Millsbaugh and J.M. Marzluff (eds.). *Academic Press*, San Diego, CA.
- Palka, D.L. and P.S. Hammond. 2001. Accounting for responsive movement in line transect estimates of abundance. *Can. J. Fish. Aquat. Sci.* 58:777-787.
- Pinedo, M.C. and A.A. Hohn. 2000. Growth layer patterns in teeth from the franciscana, *Pontoporia blainvillei*: developing a model for precision in age estimation. *Marine Mammal Science* 16(1):1-27.
- Reeves, R.R., J.A. Kahn, R.R. Olsen, S.L. Swartz and T.D. Smith. 2001. History of Whaling in Trinidad and Tobago. *J. Cetacean Res. Manage.* 3(1):45-54.
- Reeves, R. R., S.L. Swartz, S.E. Wetmore and P.J. Clapham. 2001. Historical occurrence and distribution of humpback whales in the eastern and southern Caribbean Sea, based on data from American whaling logbooks. *J. Cetacean Res. Manage.* 3(2):117-129.
- Rosenbaum, H.C., M.G. Egan, P.J. Clapham, R.L. Brownell Jr., S. Malik, M.W. Brown, B.N. White, P. Walsh and R. DeSalle. 2000. Utility of North Atlantic right whale museum specimens for assessing changes in genetic diversity. *Cons. Biol.* 14(6):1837-1842.
- Rosenbaum, H.C., R.L. Brownell Jr., M.W. Brown, S.C. Schaeff, V. Portway, B.N. White, S. Malik, L.A. Pastene, N.J. Patenaude, C.S. Baker, M. Goto, P.B. Best, P.J. Clapham, P. Hamilton, M. Moore, R. Payne, V. Browntree, C.T. Tynan, J.L. Bannister and R. DeSalle. 2000. World-wide genetic differentiation of *Eubalaena*: questioning the number of right whales. *Molecular Ecology* 9, 1793-1802.
- Rowles, T., F. VanDolah, and A.A. Hohn. 2001. Necropsy and tissue sampling protocols. Ch. 21 *in: L.A. Dierauf and F.M.D. Gulland*, eds. *CRC Handbook of Marine Mammal Medicine*. 2nd Edition. 1063 pp.
- Roden, C.L. and K.D. Mullin. 2000. Sightings of cetaceans in the northern Caribbean Sea and adjacent waters, winter 1995. *Caribbean Journal of Science* 36(3-4): 280-288.
- Scott, M.D., A.A. Hohn, A.J. Westgate, J.R. Nicolas, B.R. Whitaker, and W.B. Campbell. 2001. A note on the release and tracking of a rehabilitated pygmy sperm whale (*Kogia breviceps*). *J. Cetacean Res. Manage.* 3(1):87-94.
- Steve, C., J. Gearhart, D. Borggaard, L. Sabo and A.A. Hohn. 2001. Characterization of North Carolina Commercial Fisheries with Occasional Interactions with Marine Mammals. *NOAA Technical Memorandum NMFS-SEFSC-458*. 60 pp. NOAA-NMFS, Southeast Fisheries Science Center. 75 Virginia Beach Dr., Miami, FL 33149
- Urian, K., A.A. Hohn, and L.J. Hansen. 1999. Status of the photo-identification catalogue of coastal bottlenose dolphins of the western north Atlantic: report of a workshop of catalogue contributors. *NOAA Technical Memorandum NMFS-SEFSC-425*. NOAA-NMFS, Southeast Fisheries Science Center. 75 Virginia Beach Dr., Miami, FL 33149
- Waring, G.T., J. Quintal and S. Swartz, (eds.) 2001. U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments - 2001. *NOAA Technical Memorandum NMFS-NE-168*. 310p. NOAA-NMFS, Northeast Fisheries Science Center, 166 Water St., Woods Hole, MA 02543.
- Waring, G.T., T. Hamazaki, D. Sheehan, G. Wood and S. Baker. 2001. Characterization of beaked whale (*Ziphiidae*) and sperm whale (*Physeter macrocephalus*) summer habitat in shelf-edge and deeper waters off the northeast U.S. *Mar. Mamm. Sci.*, 17(4):703-717.
- Yeung, C. 2001. Estimates of marine mammal and marine turtle bycatch in the U.S. Atlantic pelagic longline fleet in 1999-2000. *NOAA Technical Memorandum NMFS-SEFSC-467*. 43 pp. NOAA-NMFS Southeast Fisheries Science Center. 75 Virginia Beach Dr. Miami, FL 33149.

10.2. Unpublished Literature

- Clapham, P.J. and L.T. Hatch. 2000. Determining spatial and temporal scales for population management units: lessons from whaling. International Whaling Commission, Scientific Committee document SC/52/SD2. 11p.
- Clapham, Phillip J. and R.M. Pace III. 2001. Defining triggers for temporary area closures to protect right whales from entanglements: issues and options. *NEFSC Ref. Doc.* 01-06. NOAA-NMFS, Northeast Fisheries Science Center, 166 Water St., Woods Hole, MA 02543. 39p.
- Friday, N. and T.D. Smith. 2000. The effect of age and sex selective harvest patterns for baleen whales. International Whaling Commission, Scientific Committee document SC/52/AS22. 10p.
- Garrison, L.P. 2001. Seeking a hiatus in sightings for bottlenose dolphin during summer and winter aerial surveys. Report to the Atlantic Bottlenose Take Reduction Team. NOAA-NMFS Southeast Fisheries Science Center. 75 Virginia Beach Dr., Miami, FL 33149.
- Garrison, L.P. and A.A. Hohn. 2001. Abundance Estimates for Atlantic Bottlenose Dolphin: Combining strip transect data and line transect abundance estimation. Report to the Atlantic Bottlenose Take Reduction Team. NOAA-NMFS Southeast Fisheries Science Center. 75 Virginia Beach Dr., Miami, FL 33149
- Garrison, L.P. and C. Yeung. 2001. Abundance Estimates for Atlantic Bottlenose Dolphin Stocks During Summer and Winter, 1995. Report to the Atlantic Bottlenose Take Reduction Team. NOAA-NMFS Southeast Fisheries Science Center. 75 Virginia Beach Dr., Miami, FL 33149
- Garrison, L.P. 2001. Mortality estimates for Atlantic bottlenose dolphin and protected species interactions with the directed shark gillnet fishery off Florida and Georgia from 1998-2000. Report to the Atlantic Bottlenose Take Reduction Team. NOAA-NMFS Southeast Fisheries Science Center. 75 Virginia Beach Dr., Miami, FL 33149.
- Merrick, R.L., P.J. Clapham, T.V.N. Cole, P. Gerrior and R.M. Pace III. 2001. Identification of seasonal area management zones for North Atlantic right whale conservation. *NEFSC Ref. Doc* 01-14. 18p. NOAA-NMFS, Northeast Fisheries Science Center, 166 Water St., Woods Hole, MA 02543.
- National Marine Fisheries Service (2001) Stock structure of coastal bottlenose dolphins along the Atlantic coast of the US. Report to the Atlantic Bottlenose Take Reduction Team. NOAA-NMFS Southeast Fisheries Science Center. Beaufort, NC.
- Nicolas, J., D.C. Potter, C.W. Potter, and P.E. Rosel. 2001. Results of a field collection of biopsy samples from coastal bottlenose dolphin in the mid-Atlantic. *NEFSC Ref. Doc.* 01-09. 9p. NOAA-NMFS, Northeast Fisheries Science Center, 166 Water St., Woods Hole, MA 02543.

- Palka, D. 2000 Effectiveness of gear modifications as a harbor porpoise by-catch reduction strategy off the Mid-Atlantic coast of the USA. International Whaling Commission, Scientific Committee document SC/52/SM24. 27p.
- Palka, D.L. and M.C. Rossman. 2001. Bycatch estimates of coastal bottlenose dolphin (*Tursiops truncatus*) in U.S. Mid-Atlantic Gillnet fisheries for 1996-2000. *NEFSC Ref. Doc.* 01-15. NOAA-NMFS, Northeast Fisheries Science Center, 166 Water St., Woods Hole, MA 02543. 77p.
- Palka, D. 2000. Abundance of the Gulf of Maine/Bay of Fundy harbor porpoise based on shipboard and aerial surveys during 1999. *NEFSC Ref. Doc.* 00-07. NOAA-NMFS, Northeast Fisheries Science Center, 166 Water St., Woods Hole, MA 02543. 29p.
- Polacheck, T., D. Palka, D. Borchers, J.G. Cooke, H.J. Skaug and C. Dixon. 2000. Simulation comparison of different methods for estimating whale density from double team line transect data. International Whaling Commission, Scientific Committee document SC/52/RMP18. 32p.
- Reeves, R.R., R. Rolland and P.J. Clapham (eds.) 2001. Causes of reproductive failure in North Atlantic right whales: new avenues of research. *NEFSC Ref. Doc.* 01-16. NOAA-NMFS, Northeast Fisheries Science Center, 166 Water St., Woods Hole, MA 02543. 46p.
- Rossman, Marjorie C. 2000. Effectiveness of time/area closures and acoustic deterrents as harbor porpoise bycatch reduction strategies off the northeast coast of the United States. International Whaling Commission, Scientific Committee document SC/52/SM23. 13p.
- Smith, Tim D. 2000. Comparison of two computer programs for calculating catch limits under the Revised Management Plan. International Whaling Commission, Scientific Committee document SC/52/RMP1. 16p.

USA Progress Report on Cetacean Research - May 2001 to April 2002 With Statistical Data for Calendar Year 1999

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	<i>Berardius bairdii</i>	Oregon, Northeast Pacific, Southeast Bering Sea	2, 8
Beaked whale	<i>Mesoplodon sp.</i>	eastern tropical Pacific, Oregon Northeast Pacific	4, 8
Beluga whale	<i>Delphinapterus leucas</i>	Alaska, N. Pacific	2, 3, 4, 5, 7, 8, 9
Blue whale	<i>Balaenoptera musculus</i>	California	2, 4
Bottlenose dolphin	<i>Tursiops truncatus</i>	California, eastern tropical Pacific, western N. Atlantic, Florida	2, 4, 5, 9
Bottlenose whale Southern	<i>Hyperoodon sp</i>	Oregon, Northeast Pacific	2, 8
Bowhead whale	<i>B. mysticetus</i>	Alaska, western U.S. Arctic	4, 5, 6, 8, 10
Common dolphin	<i>Delphinus delphis</i>	California, eastern tropical Pacific, N. Pacific	2, 4, 7
Cuvier's beaked	<i>Ziphius cavirostris</i>	Oregon, Northeast Pacific, Bahamas	4, 8
Dall's porpoise	<i>Phocoenoides dalli</i>	California, Washington, N. Pacific, Oregon, Southeast Bering Sea	2, 4, 7, 8, 10
Dwarf sperm whale	<i>Kogia simus</i>	Oregon, Northeast Pacific	8
Fin whale	<i>B. physalus</i>	California, N. Pacific, Oregon, Southeast Bering Sea	2, 4, 8, 10
Gray whale	<i>Eschrichtius robustus</i>	California, Washington, NE and NW Pacific, Oregon	2, 3, 4, 5, 8, 9, 10
Harbor porpoise	<i>Phocoena phocoena</i>	Alaska, eastern N. Pacific, Oregon, Northeast Pacific; Southeast Bering Sea, Washington	2, 3, 4, 7, 8
Humpback whale	<i>Megaptera novaeangliae</i>	California, Hawaii, No. Pacific, Alaska, Japan and Mexico, Oregon, Southeast Bering Sea	2, 3, 4, 6, 8, 10
Killer whale	<i>Orcinus orca</i>	Alaska, British Columbia, Oregon, Northeast Pacific; Southeast Bering	2, 4, 5, 7, 8, 10

Common Name	Scientific Name	Area/Stock(s)	Referred to in Section(s):
		Sea, California, eastern tropical Pacific	
Minke whale	<i>B. acutorostrata</i>	California, N. Pacific, Oregon, Southeast Bering Sea	2, 8
Northern right whale	<i>Eubalaena glacialis</i> <i>Eubalaena japonica</i>	North Pacific, Southeast Bering Sea	2, 8, 9, 10 2
Northern right whale dolphin	<i>Lissodelphis borealis</i>	Oregon, Northeast Pacific	2, 4, 7, 8
Pacific white-sided dolphin	<i>L. obliquidens</i>	California, eastern tropical Pacific, N. Pacific, Oregon	2, 4, 7, 8, 10
Pantropical spotted dolphin	<i>Stenella attenuata</i>	eastern tropical Pacific	2, 3, 4
Risso's dolphin	<i>Grampus griseus</i>	California, eastern tropical Pacific, Oregon, Northeast Pacific	2, 4, 8
Sperm whale	<i>Physeter macrocephalus</i>	California, N. Pacific, eastern tropical Pacific, Oregon	2, 4, 8, 10
Spinner dolphin	<i>S. longirostris</i>	eastern tropical Pacific	2, 3, 4
Striped dolphin	<i>C. coeruleoalba</i>	eastern tropical Pacific, California	2
Stejneger's beaked whale	<i>Mesoplodon stejnegeri</i>	Washington, NE Pacific	4

2. SIGHTINGS DATA

2.1. Field Work

AFSC

Gray whale census

A census of the Eastern North Pacific stock of gray whales was conducted during the southbound migration from 12 December 2001 to 5 March 2002. Systematic searches were made from observation sheds 21 m above the sea at Granite Canyon in central California. Tests of the counts conducted by primary observers included paired, independent counts and searches through fix-mounted 25x binoculars as a check of the offshore distribution. The southbound migration ended in mid-February, typical of all other years except 2001. Counts made in 2000/01 and 2001/02 were well below those made in 1997/98. Abundance estimates are reported in Rugh *et al.* (2002). (Contact: D. Rugh, AFSC).

Shipboard Surveys

Gray Whales off Washington Coast

From March 14, 2001 to February 13, 2002, vessel surveys were conducted along the northwestern coast of Washington, the Strait of Juan de Fuca, and off the west coast of Vancouver Island, Canada. During these surveys, 169 gray whales were sighted and 114 were photographed for identification. Approximately 6% of the sightings were made in the Strait of Juan de Fuca, 37% on the northwest coast of Washington, and 54% off the west coast and southwest coast of Vancouver Island. (Contact: M. Gosho, AFSC)

Central Alaska and Aleutians killer whale survey

From July 17 to August 27, 2001, a vessel survey was conducted from approximately Seward in central Alaska to Seguam 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 1937 nautical miles were surveyed on effort. There were 19 encounters (~359 individuals) with groups of killer whales. Killer whale groups were provisionally classified by type (based on behavior, external morphology and group size) as 10 groups of resident-type (~290 individuals), 8 groups of transient-type (~30 individuals) and 1 group of offshore-type (~40 individuals). A total of 8 other species of cetacean were seen, including Dall's porpoise (156 sightings), humpback whales (152 sightings), fin whales (86 sightings), minke whales (33 sightings), gray whales (22 sightings), harbor porpoise (9 sightings), sperm whales (7 sightings), and Baird's beaked whale (1 sighting). (Contact: P.R. Wade, M.E. Dahlheim, AFSC).

Southeast Alaska killer whale survey

In 2001, two 14-day killer whale cruises were completed in Southeast Alaska (May and September time frame). The main focus of the survey was to estimate the abundance of killer whales using photo-identification techniques. A total of 13 encounters occurred representing whales from both the transient and resident groups. Photographs were taken of 18 groups of killer whales and 8 groups of humpback whales. Genetic and contaminant studies are included in this project. In addition, studies on the use of radio/satellite tags to monitor killer whale behavior are being conducted. Contact (M. Dahlheim, AFSC).

Humpback and fin whales

A study of whale distribution in the vicinity of Kodiak, Alaska was initiated in collaboration with Kodiak National Wildlife Refuge (KNWR) and Universidad Autónoma de Baja California Sur (UABCS). Surveys were conducted from 4-8 September 2001. Five groups of humpback whales totaling 5 adults and 2 calves were encountered. Six individuals were photographed and biopsy samples were collected. Twenty-one groups of fin whales totaling about 34 individuals (including a mother accompanied by a calf) were encountered, photographed and biopsied. Blubber collected from the biopsy samples was conserved by freezing and will be analyzed for contaminants. (Contact: S. Mizroch, AFSC).

Platforms of Opportunity

The Platforms of Opportunity Program, coordinated by the National Marine Mammal Laboratory in collaboration with the University of Washington, has been expanded its coverage to additional vessels. The sightings database currently contains over 88,600 marine mammal sightings records, dating from 1958 through 1997. (Contact: S. Mizroch, AFSC)

Aerial Surveys

Beluga Count in Cook Inlet

A 55-hr aerial survey of Cook Inlet, Alaska was flown 5-12 June 2001 to assess distribution and abundance of the small, isolated stock of beluga whales using survey methods consistent with annual surveys conducted Cook Inlet each year since 1993 (Rugh *et al.* 2000). The flights in June 2001 included complete coverage of coastal areas around the entire Inlet (flown 1.4 km offshore) and 1,186 km of transects across the Inlet. After finding beluga groups, a series of aerial passes were made to allow at least two pairs of primary observers to make 4 or more counts of each group. Seasonal distribution of the belugas was assessed through aerial surveys (approximately 10 hrs each) conducted almost monthly from July 2001 to February 2002. These sightings, in conjunction with results from tagged whales (see Section 3) indicate that most, if not all of the year, belugas continue to inhabit the northern reaches of Cook Inlet. (Contact: D. Rugh, AFSC).

SWFSC

Shipboard Surveys

California, Oregon and Washington Marine Mammal Abundance Survey

A marine mammal assessment survey was conducted of the U.S. West Coast waters out to a distance of approximately 300 nautical miles. The overall objective of the cruise was to estimate the abundance and understand

the distribution of dolphins, whales and porpoise. Other objectives included acoustic sampling, biopsy sampling and photo-identification. Biological and oceanographic data were collected to better characterize the animals' habitat. A total of 513 cetacean schools were observed, 24,495 individual seabirds, and 69 individual pinnipeds. Just over 10,000 km of trackline were covered. A hydrophone array was towed during daylight hours to record cetacean vocalizations. Recordings of vocalizations of visually detected animals using the towed hydrophone array were made of short-beaked common dolphins, long-beaked common dolphins, striped dolphins, Pacific white-sided dolphins, northern right whale dolphins, bottlenose dolphins, Risso's dolphin, killer whales, and sperm whales. Thirty-eight sonobuoys were deployed opportunistically and recordings were obtained from two groups of killer whales and fin, humpback, and blue whales. (Contact: J. Barlow, SWFSC).

Chase-Encirclement Stress Studies

A suite of complementary studies on physiological stress responses was conducted between August and October, 2001 in the eastern tropical Pacific, to evaluate potential effects of repeated chase and encirclement on pantropical spotted dolphins (*Stenella attenuata*) and eastern spinner dolphins (*Stenella longirostris*). The studies were conducted as part of a larger research program mandated under the 1997 International Dolphin Conservation Program Act (IDCPA) to investigate whether the eastern tropical Pacific tuna fishery is having a significant adverse impact on these dolphin stocks. Stress studies conducted during the 2-month cruise included investigations of blood samples, immune function, thermal condition, behavioral ecology, reproductive parameters, set-associated behavior, and stress-response protein profiles in spotted dolphin skin. Working with a chartered tuna purse seiner, about 1500 dolphins were captured and released in 27 targeted sets. Most of the captured animals were spotted dolphins. (Contact: K. Forney, SWFSC).

Aerial Surveys

Gray Whale northbound cow/calf shore-based and aerial surveys

For the eighth consecutive year, a shore-based sighting survey was conducted to estimate the number of northbound migrating gray whale calves in the eastern North Pacific stock. The primary objective of the survey was to determine whether the proportion of calves in the population (indexed as the number of calves passing the research site divided by the population size estimated from the most recent southbound survey) has declined. Aerial photographic surveys were also conducted during the northbound migration to assess reproductive condition of females, the overall condition of the population, and to examine the temporal segregation of the migrating whales. (Contact: W. Perryman, SWFSC).

Northern Right Whale Aerial and Vessel Surveys

An aerial survey was conducted in the southeastern Bering Sea during July of 2001. The objectives of the survey were to assess the spatial and temporal distribution of right whales on their summer feeding grounds and to develop a minimum estimate for the number of whales in this area. Two sightings, totaling five right whales were made. The minimum estimated number based on photographic identification is 14, with one of the individuals having been photographed in multiple years. Information on the sizes and lengths of animals from aerial photographs were collected as well as identifying characteristics of individual right whales and scars that might indicate human-related interactions (Contact: R. LeDuc, SWFSC).

2.2. Analyses/Development of Techniques

AFSC

Video analysis provided precise counts of beluga whales in Cook Inlet (Hobbs *et al.* 2000b) relative to counts made by observers during the aerial surveys described above (Rugh *et al.* 2000). These counts were corrected for whale groups missed during the aerial survey, adult whales beneath the water surface but within the viewing area, and whales missed due to video resolution limitations), particularly for juvenile whales, who are more cryptically colored than are the white adults (Litzky 2001). Accordingly, the calculated abundance for June 2001 was 386 (CV = 8.7%; 95% CI=325-458), indicating an annual rate of increase of 3.6% since 1998 when the native harvest virtually stopped. Corrected abundance estimates for counts made in 1994-2000 are available in Hobbs *et al.* (2000a). (Contact: R. Hobbs, AFSC).

NWFSC

An oceanographic description of critical habitat and prey of North Pacific right whales *Eubalaena japonica* on the southeastern Bering Sea shelf has been completed (Tynan *et al.*, 2001, *Science*). (Contact: C. Tynan, NWFSC).

An analysis of the distribution and abundance of killer whales *Orcinus orca* on the southeastern Bering Sea shelf and slope during 1997 and 1999 has been completed (Tynan, unpublished report, 2001). (Contact: C. Tynan, NWFSC).

More than thirty laboratories participated in the NIST/NOAA National Marine Analytical Quality Assurance Program for metals analysis. Examination of data indicated suitable analytical performance for all elements except silver. There was difficulty quantifying low levels of three other elements when values approach detection limits. Use of graphite furnace atomic absorption instead of inductively coupled plasma optical emission spectroscopy would have improved detection limits for one of these elements (copper). One stage of the microwave digestion procedure was refined to help improve sample preparation quality and reduce sample losses due to failure of digestion vessels. This refinement reduced losses due to failure of digestion vessels, but did not change the quality (Contact: G. Ylitalo, NWFSC)

Development began for an analytical method suitable for the analysis of fatty acids in blubber of marine mammals and whole body tissues of marine mammal prey. The method uses (1) accelerated solvent extraction to extract lipid from wet tissue, (2) derivitization of the total fatty acids (and internal standard) to methyl esters (FAMES) using a simple one step transesterification reaction, (3) extraction of FAMES into iso-octane, and finally (4) analysis by GC-MS in EI-SIM mode on a DB-23 capillary column. Analysis of two independent control materials by this method generated fatty acid results which were in excellent agreement with certified values. Recently, the method was applied to analyze FAMES in whole body Cook Inlet eulachon and chinook salmon, to determine if their fatty acid profiles are sufficiently unique to distinguish between them, as well as to determine if stocks of the individual prey species from different locations can be discerned. Ultimately, these particular data will be compared to fatty acid profiles from beluga whale biopsy samples from Cook Inlet to determine the relative importance of these two particular prey species to the feeding ecology of these predators (Contact: P. Krahn, NWFSC).

3. MARKING DATA

3.1. Field work - Natural Marking Data for Calendar Year 2001.

NWFSC/AFSC/SWFSC

Species	Area/Stock	New Animals	Total Cataloged	Contact Person/Institute
Killer whale, <i>Orcinus orca</i>	SE Alaska Central AK & Aleutians	N/A N/A	13 groups 18 groups	M. Dahlheim, AFSC
Humpback whale, <i>Megaptera novaeangliae</i>	Central AK & Aleutians Kodiak, AK	N/A N/A	8 groups 6 individuals	M. Dahlheim, AFSC S. Mizroch, AFSC
Fin whale, <i>B. physalus</i>	Kodiak, AK	N/A	34 individuals	S. Mizroch, AFSC
Gray whale, <i>Eschrichtius robustus</i>	NW Washington, Vancouver Is.	N/A	114 individuals	M. Goshko, AFSC
Right whale, <i>E. glacialis</i>	SE Bering Sea	N/A	5 individuals	R. LeDuc, SWFSC

SWFSC

No. Pacific Humpback whale Photo-ID Collection

The North Pacific Humpback Whale photo-identification collection curated by the National Marine Mammal Laboratory currently has over 24,000 photographs in the computer-assisted matching database.

The humpback whale flukes database was used for other large-scale studies on movements, migration and population structure of humpback whales in the North Pacific (Calambokidis *et al.* 2001; Urban *et al.* 2001). (Contact S. Mizroch, AFSC).

3.2. Telemetry Data (satellite and radio tags) for Calendar Year 2001.

AFSC/SWFSC

Species	Area/stock	Tag Type	No. Deployed	Contact Person/Institution
Beluga whale	Cook Inlet	Long term location Short-term dive/location	7 5	R. Hobbs, AFSC
Pantropical spotted dolphin	E. Tropical Pacific	Radio with TDR Radio with TDVR Radio with TDVR/heat flux Satellite Short range bullet radio tag Visual roto tag	3 4 2 6 7 213	S. Chivers, SWFSC
Spinner dolphin	E. Tropical Pacific	Short range bullet radio tag	1	S. Chivers, SWFSC
Harbor porpoise	Washington State Olympia Peninsula	PPT/VHF TDR/VHF (suction cup)	4 2	B. Hanson, AFSC

AFSC

In October 2001, four harbor porpoises were captured with a large mesh gillnet from a small vessel near the Sekiu River, Olympic Peninsula, Washington State. All four (two subadult males, a nearly adult female, and nearly adult male) were released unharmed with a pair of streamlined satellite-linked (PTT)/VHF tags pinned to their dorsal fin for long-term monitoring. In addition, two of the porpoises had a suction-cup TDR/VHF radio attached for short-term collection of dive and velocity data. One of these tags was not recovered but the other yielded approximately 32 hours of TDR data. Each porpoise remained in the vicinity of the capture location for about 1-2 weeks before moving out of the general area. Three of the porpoises moved to the west, to near Swiftsure Bank while the other moved directly to the east, near Port Angeles. Signal loss occurred for both transmitters on the subadult male porpoise that had moved to near Port Angeles approximately one month after tagging. Contact was lost with the other subadult male porpoise that had moved to the west at about 2 months post-tagging. However, just before contact was lost it had returned to the vicinity of the capture site. The other two porpoises moved into the central Strait of Juan de Fuca about the beginning of December, with one remaining in the waters near Port Angeles and the other in the vicinity of Middle Bank near Victoria, British Columbia. Signals were lost from the porpoise near the Port Angeles about the beginning of February, while signals have continued to be received to date (mid-March) for the nearly adult female porpoise from the Middle Bank area (Contact: B. Hanson).

Cook Inlet Beluga Tagging

From 10-21 August 2001, researchers made 24 net sets on belugas in Cook Inlet using a modified encirclement technique. These sets resulted in 11 captures, but two cow-calf pairs were released within 5 minutes of capture. The 7 other whales were given long-term location tags, and 5 also had short-term dive behavior and location tags. Through February 2002, one of the tags was still providing location information. Almost all of the whales stayed in the northern half of Cook Inlet through the winter in spite of severe ice. One exception was a whale that made an excursion to the southwest side of the inlet. Biopsies for genetics analysis were taken from 9 belugas and samples for fatty acid analysis were taken from 7 animals. (Contact: R. Hobbs, AFSC)

SWFSC

Chase-Encirclement Stress Study

During this shipboard survey study (see section 2.1), 9 pantropical spotted dolphins (*Stenella attenuata*) were radio tagged and tracked and 6 spotted dolphins were satellite tagged and tracked. The dolphins tracked with VHF radio tags also carried time-depth recorders (TDRs) (n=3), time-depth-velocity recorders (TDVRs) (n=4) or time-depth-velocity-heat flux recorders (thermal) (n=2). Two TDRs, 2 TDVRs and both thermal tags were recovered and dolphins were tracked from 1 to 6 days. Satellite tagged dolphins were tracked from 2 to 20 days. One additional TDR/VHF radio tag was deployed on an eastern spinner dolphin (*Stenella longirostris orientalis*) but was not tracked. Also attached were 213 visual tags (all spotted dolphin) and 8 short-range radio tags (1 spinner and 7 spotted dolphins) to obtain information about dolphin associations in the herds that were captured. (Contact: S. Chivers, SWFSC).

4. TISSUE/BIOLOGICAL SAMPLES COLLECTED

4.1. Biopsy Samples for Calendar Year 2001

NWFSC and AFSC

Species Name	Area/Stock	No. Samples	Contact Person/Institution
Beluga whale, <i>Delphinapterus leucas</i>	Cook Inlet, Alaska	16	R. Hobbs, AFSC
Fin whale, <i>Balaenoptera physalus</i>	Bering Sea, Alaska Kodiak, AK	3 14	M. Dahlheim, AFSC S. Mizroch, AFSC
Gray whale, <i>Eschrichtius robustus</i>	Strait of Juan de Fuca/E. No. Pacific Bering Sea, Alaska	5 3	M. Gosho, AFSC M. Dahlheim, AFSC
Humpback whale, <i>Megaptera novaeangliae</i>	Bering Sea, Alaska Kodiak, Alaska	12 5	M. Dahlheim, AFSC Sally Mizroch, AFSC
Killer whale, <i>Orcinus orca</i>	SE Alaska, Calif., Bering Sea Prince Wm. Sound, AK, Bering Sea	17 10	M. Dahlheim, AFSC C. Matkin, No. Gulf Oceanic Society

SWFSC

Species Name	Area/Stock	No. Samples	Contact Person/Institution
Long-beaked common dolphin, <i>Delphinus capensis</i>	California/Oregon/Washington	5	S. Chivers, SWFSC
Short-beaked common dolphin, <i>Delphinus delphis</i>	California/Oregon/Washington	104	
Bottlenose dolphin, <i>Tursiops truncatus</i>	California/Oregon/Washington	10	
Risso's dolphin, <i>Grampus griseus</i>	California/Oregon/Washington	5	
Pacific white-sided dolphin, <i>Lagenorhynchus obliquidens</i>	California/Oregon/Washington	11	
Northern right whale dolphin, <i>Lissodelphis borealis</i>	California/Oregon/Washington	32	
Killer whale, <i>Orcinus orca</i>	California/Oregon/Washington	4	
Dall's porpoise, <i>Phocoenoides dalli</i>	California/Oregon/Washington	9	

Species Name	Area/Stock	No. Samples	Contact Person/Institution
Sperm whale, <i>Physeter macrocephalus</i>	California/Oregon/Washington	10	
Cuvier's beaked whale, <i>Ziphius cavirostris</i>	California/Oregon/Washington	1	
Gray whale, <i>Eschrichtius robustus</i>	California/Oregon/Washington	3	
Unidentified Rorqual, <i>Balaenoptera spp.</i>	California/Oregon/Washington	1	
Fin whale, <i>Balaenoptera physalus</i>	California/Oregon/Washington	13	
Blue whale, <i>Balaenoptera musculus</i>	California/Oregon/Washington	12	
Humpback whale, <i>Megaptera novaeangliae</i>	California/Oregon/Washington	16	
Pantropical spotted dolphin, <i>Stenella attenuata</i>	eastern tropical Pacific	208	
Eastern spinner dolphin, <i>Stenella longirostris orientali</i>	eastern tropical Pacific	3	

4.2. Samples From Directed Catches for Calendar Year 2001

Species Name	Area/Stock(s)	No. Samples	Contact Person/Institute
Beluga whale, <i>Delphinapterus leucas</i>	Cook Inlet, Alaska	6	B. Mahoney, AFSC
Bowhead whale, <i>Balaena mysticetus</i>	Alaska	105	T. O'Hara, N. Slope Borough

4.3 Samples From Stranded Animals for Calendar Year 2001

Species Name	Area/Stock(s)	Number	Contact Person/Institute
Beluga whale, <i>Delphinapterus leucas</i>	Alaska	6	B. Mahoney, AFSC
Gray whale, <i>Eschrichtius robustus</i>	Eastern No. Pacific Eastern No. Pacific	14 6	J. Calambokidis, Cascadia Research B. Norberg, NWFSC
Harbor porpoise, <i>Phocoena phocoena</i>	Central Calif. Coast	2	F. Gulland, The Marine Mammal Center
Humpback whale, <i>Megaptera novaeangliae</i>	Alaska	1	C. Gabriele, Glacier Bay National Park and Preserve
Stejneger's beaked whale, <i>Mesoplodon stejnegeri</i>	Washington coast	1	B. Norberg, NWFSC
Pacific white-sided dolphin, <i>Lagenorhynchus obliquidens</i>	Central Calif. Coast	6	F. Gulland, The Marine Mammal Center

5. POLLUTION STUDIES

NWFSC

Gray Whales

Approximately 20 blubber samples that were collected from gray whales that stranded in Puget Sound waters as well as off the coasts of Washington State and British Columbia in 2000 were analyzed for lipid content and lipid profiles. Similar to previous findings, the lipid values in the blubber of the stranded whales were quite low compared to lipid concentrations reported in blubber of gray whales harvested during a Russian subsistence harvest

in 1994. The blubber samples of “advanced decomposed” gray whales had lower proportions of neutral lipids (e.g., triglycerides) than did blubber of “fresh stranded” whales. To date, approximately 175 blubber samples from the eastern north Pacific stock of gray whales have been analyzed for OCs and lipids (Ylitalo *et al.* 2001). (Contact: G. Ylitalo, NWFSC)

Bowhead whales

A number of high quality blubber samples from bowhead whales from the Western Arctic/Bering Sea that were collected during a subsistence harvest in 2000 were analyzed for various classes of lipids. In addition, 42 of these blubber samples were analyzed for selected organochlorines. Lipid concentrations of the bowhead blubber ranged from 25 – 83%. Low concentrations of OCs were measured in the bowhead whale blubber samples and were not significantly correlated with lipid content. The PCB concentrations determined by our HPLC/PDA were in agreement with concentrations previously reported using the GC/ECD method (Contact: G. Ylitalo, NWFSC).

Killer Whales

Forty five blubber biopsy samples of free-ranging killer whales from the Eastern North Pacific were analyzed for OCs and lipids. Toxic PCB congeners were determined by HPLC/PDA method whereas other OCs (e.g., HCH, chlordanes) were determined by GC/MS method to provide additional information on the profiles and levels of other toxic contaminants (Contact: G. Ylitalo, NWFSC).

6. STATISTICS FOR LARGE CETACEANS

6.1. Direct Catches (Commercial, Aboriginal and Scientific Permits) for Calendar year 2001

AFSC

Species Name	Type of Catch	Area/Stock	Total Landed	Struck & Lost
Bowhead whale	AK Eskimo subsistence	N. Slope Borough	49	26

6.2. Incidental Catches for Calendar year 1999

AFSC

Species Name	Area/Stock	Reported	Est. Total	Fishery Type
Humpback whale, <i>Megaptera novaeangliae</i>	N. Pacific (Alaska)	1	1	Alaska groundfish fisheries (Trawl)
Fin whale, <i>Balaenoptera physalus</i>	Alaska	1	1	
Sperm whale, <i>Physeter macrocephalus</i>	Alaska	1*	N/A**	Alaska groundfish fisheries (Longline)

* Injured, ** Estimate not calculated

7. STATISTICS FOR SMALL CETACEANS

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
1999			
Beaufort Sea	33	ND	33
Chukchi Sea	52	0	52
Eastern Bering Sea	134	25	159
Kuskokwim	0	0	0
Bristol Bay	11	0	11
1998			
Beaufort Sea	52	5	57
Chukchi Sea	91	5	96
Eastern Bering Sea	143	27	170
Kuskokwim	2	ND	2
Bristol Bay	18	1	19
1997			
Beaufort Sea	32	18	50
Chukchi Sea	16	3	19
Eastern Bering Sea	141	32	173
Kuskokwim	ND	ND	ND
Bristol Bay	6	4	10

7.2. Incidental Catches For The Calendar Year 1999

AFSC

Species	Area/Stock(s)	Reported	Est. Total	Fishery Type
Killer whale, <i>Orcinus orca</i>	Alaska	2	4 ¹	Alaska groundfish fisheries (trawl, longline and pot)

Dall's porpoise, <i>Phocoena dalli</i>	Alaska	3	4 ¹	Alaska groundfish fisheries (trawl, longline and pot)
Dall's porpoise, <i>Phocoena dalli</i>	Washington, Oregon and California	1	1	At-sea processing groundfish trawl fishery

¹ Reported included unmonitored takes; estimate may be low

SWFSC

Species	Area/Stock	Incidental Mortality		
		Reported	Est. Total	Fishery type
Short-beaked common dolphin, <i>Delphinus delphis</i>	California/Oregon/ Washington	34 ¹	191	Swordfish/thresher shark drift gillnet fishery
Long-beaked common dolphin, <i>Delphinus capensis</i>	California	1 ¹	8	Swordfish/thresher shark drift gillnet fishery
Unidentified common dolphin , <i>Delphinus</i> spp.	California/Oregon/ Washington	2 ¹	2	Swordfish/thresher shark drift gillnet fishery
Northern right whale dolphin , <i>Lissodelphis borealis</i>	California/Oregon/ Washington	3 ¹	17	Swordfish/thresher shark drift gillnet fishery
Harbor porpoise, <i>Phocoena phocoena</i>	Central California	28 ²	133	California angel shark/halibut and other species large mesh (>3.5") set gillnet fishery

¹ Cameron, G.A. and Forney, K.A. 2000. Preliminary estimates of cetacean mortality in California/Oregon gillnet fisheries for 1999. Rept. Int. Whal. Comm., Scientific Committee document SC52/O24. 12 p. [Available from Southwest Fisheries Science Center, P.O. Box 271, La Jolla, CA 92038-0271, USA].

² Carretta, J.V. *et al.* 2001. U.S. Pacific Marine Mammal Stock Assessments: 2001. NOAA Technical Memorandum NMFS-SWFSC-317. 280 pp. NOAA-NMFS, Southwest Fisheries Science Center, P.O. Box 271, LaJolla, CA 92038-0271, USA.

8. OTHER STUDIES AND ANALYSES

NWFSC

Cetacean surveys during GLOBEC Northeast Pacific Northern California Current Program.

Line-transect data were collected during two U.S. Northeast Pacific Global Ocean Ecosystem Dynamics (GLOBEC) process cruises in the Northern California Current off Oregon and northern California during 2000. The surveys examined the physical and biological factors contributing to linkages between top trophics (marine mammals and seabirds) and mid-trophic level prey (zooplankton and fish). Comparisons of the distribution and abundance of cetaceans and seabirds relative to climate forcing and weather patterns, physical oceanographic features (e.g. coastal upwelling fronts, mesoscale eddies, bank circulation dynamics) and scales of biological production at levels of primary production (e.g. chlorophyll values), secondary production (acoustic and net-tow derived estimates of zooplankton) and fish production (via acoustic and trawl-derived estimates of fish) were made (Batchelder *et al.*, submitted). Associations between topography, circulation patterns and coastal fronts suggest that cetaceans, seabirds, and their prey rely strongly on these features to provide regions of predictably productive foraging. (Contacts: C. Tynan, NWFSC).

Estimation of the abundance of cetacean species, stratified by shelf and slope strata, in the southeastern Bering Sea during the summers of 1997 and 1999 has been completed (C.T. Tynan, submitted). The analysis of cetacean distribution also considers the interannual and longer-term climatic and ecological variability in the shelf system, as well as the amount of prey consumed. The abundances of cetaceans during summer for the southeastern Bering Sea Middle Shelf (50 – 100 m) Outer Shelf (100 – 180 m), slope (180 – 2000 m), and Inner Shelf north of the Aleutians

(< 50 m depth) are estimated at: 794 (CV=43.3%) fin whales for 1997 and 1184 (CV=44.8%) fin whales for 1999; 1730 (CV=53.1%) humpback whales for 1997; 27,268 (CV=28.2 %) Dall's porpoises for 1997 and 32,303 (CV=21.0%) Dall's porpoises for 1999; and 16,885 (CV=26.6%) harbor porpoises for 1997. (Contact: C. Tynan, NWFSC).

AFSC

The National Science Foundation (NSF) Shelf-Basin Interaction (SBI) Program will launch a 5-year oceanographic and biologic research program in the Western Arctic (Chukchi and Beaufort seas) beginning in May 2002. The goal of the program is to assess the impacts of global change on the physical and biological connections in the Arctic ecosystem, with physical measurements focused on the shelf-basin interface. Marine mammal observers will be included on some of the cruises. Two workshops funded by the NSF/Biocomplexity Program were co-convened to develop a proposal that focuses on the complex interconnections that support forage opportunities for bowhead whales, and therefore subsistence whaling opportunities, offshore Northern Alaska (SC/54/E3). Also, participation continues in planning meetings for the Study of Environmental Arctic Change (SEARCH), a new multi-agency research program on changes occurring in the Arctic and their potential impacts on Arctic biota. Opportunities for research within the broader Arctic Science community are summarized in a For Information paper to be submitted to the Environmental Concerns working group. (Contact: S. Moore, AFSC).

North Atlantic humpback whales

The model framework within which an assessment of North Atlantic humpback whales can be conducted was expanded to accommodate a wider variety of dynamics. The population dynamics model underlying this new framework is density-dependent, age- and sex-structured and allows for multiple feeding and breeding grounds. Density-dependence can act on a the feeding ground or stock (a feeding area-breeding area combination) level. The model allows for a depensatory stock-recruitment relationship. A single maximum sustainable yield rate (MSYR) or feeding ground specific rates can be estimated. A paper (SC/54/H1) describing the assessment framework and population dynamics model will be presented at the 2002 IWC meeting. (Contact: N. Friday, AFSC).

Ecosystem studies

Modification to an Eastern Bering Sea Ecopath/Ecosim model has continued in an attempt to more accurately model the dynamics observed in that ecosystem (SC/54/E1). The model is being calibrated to fit fisheries and food habits data from 1979-present. For Eastern Bering Sea cetaceans, model input data on abundance, biological parameters, distribution, seasonality, and diet composition have been updated. Cetacean species groups, which combine a number of similar species, have been modified to provide greater consistency in the diet composition of species in each group. Species of interest and with sufficient data are being modeled as individual species. Ecosim runs are being compared to time trend data for single species and projected diet composition results are being compared to current diet composition data. Sensitivity analyses of parameter values are being conducted, and the effects of environmental forcing are being explored. (Contact: N. Friday, AFSC).

9. LITERATURE CITED

- Hobbs, R. C., Rugh, D. J. and DeMaster, D. P. 2000a. Abundance of belugas, *Delphinapterus leucas*, in Cook Inlet, Alaska, 1994-2000. *Mar. Fish. Rev.* 62(3):37-45.
- Hobbs, R. C., Waite, J. M. and Rugh, D.J. 2000b. Estimates of beluga, *Delphinapterus leucas*, group sizes in Cook Inlet, Alaska, from aerial video recordings and observer counts. *Mar. Fish. Rev.* 62(3):46-59.
- Litzky, L.K. 2001. Monitoring recovery status and age structure of Cook Inlet, Alaska belugas by skin color determination. Masters Thesis. 76 p.
- Rugh, D.J., K.E.W. Shelden, and B.A. Mahoney. 2000. Distribution of belugas, *Delphinapterus leucas*, in Cook Inlet, Alaska, during June/July, 1993-2000. *Mar. Fish. Rev.* 63(3):6-21.
- Rugh, D.J., Breiwick, J.M., Hobbs R.C. and Lerczak, J.A. 2002. Estimated abundance of the Eastern North Pacific stock of gray whales in 2000/01 and 2001/02. (Paper presented to the IWC Scientific Committee in April 2002.)
- Tynan, C.T. (submitted, in review). Ecological importance of cetaceans on the Southeastern Bering Sea shelf: Changes in carbon flow to large whales. *Mar. Ecol. Prog. Ser.*
- Tynan, C.T., DeMaster, D.P. and Peterson, W.T. 2001. Endangered right whales on the southeastern Bering Sea shelf. *Science* 294: 1894.
- Ylitalo, G.M., Krahn, M.M., Yanagida, G.K., Gulland, F.M.D., Calambokidis, J., Gearin, P., Gosho, M., Norberg, B., Duffield, D., Holahan, P., Stein, J.E. and Rowles, T. Supplement to: organochlorine contaminant concentrations and lipid profiles in eastern North Pacific gray whales (*Eschrichtius robustus*). 12 p. International Whaling Commission, Scientific Committee document SC/53/E 4.

10. PUBLISHED LITERATURE

10.1 Published or "In Press" Literature.

- Ainley, D.G., Tynan, C.T. and Stirling, I. In press. Sea ice: A critical habitat for polar marine mammals and birds. Chapter *In*: D. Thomas & G. Dieckmann (eds.), *Sea Ice – An Introduction to its Physics, Biology, Chemistry and Geology*, *Blackwell Science*.
- Allen, A.C., S.L. Mesnick and T. Gerrodette. 2000. Evasive behavior of eastern tropical Pacific dolphins relative to research vessels, 1986-90 and 1998. *SWFSC Admin Rept.* LJ-00-09. 42p.
- Archer, F., T. Gerrodette, A. Dizon, K. Abella, and S. Southern. 2001. Unobserved kill of nursing dolphin calves in a tuna purse-seine fishery. *Marine Mammal Science*. 17:540-554.
- Au, D.W., R.L. Pitman, and L.T. Ballance. 1999. Yellowfin tuna associations with seabirds and subsurface predators. *In*: Inter-American Tropical Tuna Commission Special Report 11. Proceedings of the International Workshop on the Ecology and Fisheries for Tunas Associated with Floating Objects.
- Ballance, L.T., D.G. Ainley, and G.L. Hunt, Jr. 2001. Seabird foraging ecology. Pages 2636-2644 *In*: J.H. Steele, S.A. Thorpe and K.K. Turekian (eds.) *Encyclopedia of Ocean Sciences*, vol. 5. *Academic Press*, London.
- Ballance, L.T., R.C. Anderson, R.L. Pitman, K. Stafford, A. Shaan, Z. Waheed, & R.L. Brownell, Jr. 2001. Cetacean sightings around the Republic of the Maldives, April 1998. *J. Cet. Res. and Manage.* 3(2):213-218.
- Barlow, J. and B.L. Taylor. 2001. Estimates of large whale abundance off California, Oregon, Washington and Baja California based on 1993 and 1996 ship surveys. *SWFSC Admin. Rept.* LJ-01-03. 12p.
- Brownell, R.L. Jr., and T. Kasuya. (In press). Western gray whale captured off western Hokkaido, Japan. *Journal of Cetacean Research & Management* (Gray Whale Special Issue).
- Carretta, J.V., M.S. Lowry, C.E. Stinchcomb, M.S. Lynn, and R.E. Cosgrove. 2000. Distribution and abundance of marine mammals at San Clemente Island and surrounding offshore waters: Results from aerial and ground surveys in 1998 and 1999. *SWFSC Admin. Rept.* LJ-00-02. 44p.
- Croll, D.A., B.R. Tershy, R. Hewitt, D. Demer, S. Hayes, P. Fiedler, J. Popp, and V.L. Lopez. (In press). An integrated approach to the foraging ecology of marine birds and mammals. *Deep-Sea Research*.
- Croll, D. A., B. R. Tershy, R. P. Hewitt, D.A. Demer, P.C. Fiedler, S. E. Smith, W. A. Armstrong, J. M. Popp, T. Kiekhefer, V. R. Lopez, J. Urban, and D. Gendron. 1998. An integrated approach to the foraging ecology of marine birds and mammals. *Deep-Sea Res. II* 45:1353—1371.
- Dizon, A., S. Baker, F. Cipriano, G. Lento, P. Palsbøll, and R. Reeves. 2000. Molecular genetic identification of whales, dolphins, and porpoises: Proceedings of a workshop on the forensic use of molecular techniques to identify wildlife products in the marketplace. *NOAA Technical Memorandum NOAA-TM-NMFS-SWFSC-286*. 51p.
- Donahue, M.A., B.L. Taylor and S.B. Reilly. 2000. IDCPA research program chase-recapture experiment consultation, Southwest Fisheries Science Center, La Jolla, CA, 25-26 April 2000. *Admin. Rept.* LJ-00-15. 14p
- Donahue, M.A. & S.B. Reilly. 2001. IDCPA Research Program analysis decision framework consultation, Southwest Fisheries Science Center, La Jolla, CA, 27-28 April 2000. *Admin. Rept.* LJ-00-16. 32p.
- Escorza-Trevino, S., and A.E. Dizon. 2000. Phylogeography, intraspecific structure, and sex-biased dispersal of Dall's porpoise, *Phocoenoides dalli*, revealed by mitochondrial and microsatellite DNA analysis. *Molecular Ecology* 9(8):1049-1060.
- Ferguson, M.C. 2001. Spatial distribution and density of cetaceans in the eastern Pacific Ocean based on 1986-1996 research vessel surveys. *SWFSC Admin. Rept.* LJ-01-04. 61 p.
- Finneran, J.J., C.W. Oliver, K.M. Schaefer, and S.H. Ridgway. 2000. Source levels and estimated yellowfin tuna (*Thunnus albacares*) detection ranges for dolphin jaw pops, breaches, and tail slaps. *J. Acoust. Soc. Am.* 107(1):649-656.
- Forcada, J. and A. Aguilar. 2000. Use of photographic identification in capture-recapture studies of Mediterranean monk seals. *Marine Mammal Science* 16:767-793.
- Forcada, J. 2000. Can population surveys show if the Mediterranean monk seal colony at Cap Blanc is declining in abundance? *Journal of Applied Ecology* 37:171-181.
- Forney, K.A. 2000. Monitoring marine mammal and seabird bycatch in the Monterey area set gillnet fishery. *In*: J. Carless (ed). *Ecosystem Observations, Annual Report of the Monterey Bay National Marine Sanctuary 1999*. (1 page article)
- Forney, K.A. 2000. Environmental models of cetacean abundance: a step towards reducing uncertainty in population trends. *Conserv. Biol.* 14(5):1271-1286.
- Forney, K. A., J. Barlow, M. M. Muto, M. Lowry, J. Baker, G. Cameron, J. Mobley, C. Stinchcomb, and J. V. Carretta. 2001. U.S. Pacific marine mammal stock assessments: 2000. *NOAA Tech. Memo.*, NOAA-TM-NMFS- SWFSC-300, 276 p.
- Gabriele, C. M., Straley, J.M., Mizroch, S.A., Baker, C.S., Craig, A.S., Herman, L.M., Glockner-Ferrari, D., Ferrari, M.J., Cerchio, S., von Ziegeler, O., Darling, J., McSweeney, D., Quinn II, T.J., and Jacobsen, J.K. 2001. Estimating the calf mortality rate of central North Pacific humpback whales. *Can. J. Zool.* 79:589-600.
- Gerrodette, T. 2000. Preliminary estimates of 1999 abundance of four dolphin stocks in the eastern tropical Pacific. *SWFSC Admin. Rept.* LJ-00-12. 18p.
- Gosho, M. E., P. J. Gearin, J. Calambokidis, K. M. Hughes, L. Cooke, and V. E. Cooke. 2001. Regional movements of gray whales off the coasts of northern Washington and southern Vancouver Island, 1996-2000. pp. 45-68 *In*: Anita L. Lopez and Robyn P. Angliss, editors, *Marine Mammal Protection Act and Endangered Species Act implementation program 2000*. U.S. Department of Commerce, Seattle, WA. AFSC Processed Report 2001-06.
- Hyrenbach, K.D., K.A. Forney and P.K. Dayton. 2000. Marine protected areas and ocean basin management. *Aquatic Conservation: Marine and Freshwater Ecosystems* 10:437-458.
- Jackson, A.R. 2001. Cetacean survey line-transect data verification and management. *NOAA Tech. Memo.* NOAA-TM-NMFS-SWFSC-305. 43 p.

- Kinzey, D., T. Gerrodette, J. Barlow, A. Dizon, W. Perryman and P. Olson. 2000. Marine mammal data collected during a survey in the eastern tropical Pacific Ocean aboard the NOAA Ships *McArthur* and *David Starr Jordan*, July 28 - December 9, 1999. *NOAA Technical Memorandum NOAA-TM-NMFS-SWFSC-293*. 89 pp.
- Kinzey, D., P. Olson and T. Gerrodette. 2000. Marine mammal data collection procedures on research ship line-transect surveys by the Southwest Fisheries Science Center. *SWFSC Admin Rept.* LJ-00-08. 32p.
- Kinzey, D. and T. Gerrodette. 2001. Conversion factors for binocular reticles. *Marine Mammal Science* 17(2):353-361.
- Kinzey, D., T. Gerrodette, A. Dizon, W. Perryman, P. Olson and S. Rankin. 2001. Marine mammal data collected during a survey in the eastern tropical Pacific Ocean aboard the NOAA ships *McArthur* and *David Starr Jordan*, July 28 - December 9, 2000. *NOAA Tech. Memo.* NOAA-TM-NMFS-SWFSC-303. 100 p.
- Krahn, M.M., Ylitalo, G.M., Burrows, D.G., Calambokidis, J., Moore, S.E., Gosh, M., Gearin, P., Plesha, P.D., Brownell, R.L., Blokhin, S.A., Tilbury, K.L., Rowles, T. and Stein, J.E. 2001. Organochlorine contaminant concentrations and lipid profiles in eastern North Pacific gray whales (*Eschrichtius robustus*). *J. Cetacean Res. Manage.* 3(1): 19-29.
- LeDuc, R.G., and A.E. Dizon. (In press). Reconstructing the roqual phylogeny: With comments on the use of molecular and morphological data for systematic study. In: C.J. Pfeiffer (ed.) *Cell and Molecular Biology of Marine Mammals*.
- LeDuc, R.G., D.W. Weller, J. Hyde, A.M. Burdin, P.E. Rosel, R.L. Brownell, Jr., B. Würsig, and A.E. Dizon. (In Press) Genetic differences between western and eastern North Pacific gray whales. *Journal of Cetacean Research & Management (Gray Whale Special Issue)*.
- LeDuc, R.G., W.L. Perryman, J.W. Gilpatrick, Jr., J. Hyde, C. Stinchcomb, J.V. Carretta and R.L. Brownell, Jr. 2001. A note on recent surveys for right whales in the southeastern Bering Sea. *Journal of Cetacean Research & Management. (Special Issue)* 2, 287-289.
- LeDuc, R.G., A. Rosenberg, A.E. Dizon, A.M. Burdin, S.A. Blokin, and R.L. Brownell, Jr. (Submitted). Genetic analyses (mtDNA and microsatellites) of two populations of bowhead whales. *Journal of Cetacean Research & Management.* (as of 4/26/01)
- Mesnick, S. 2001. Genetic Relatedness in Sperm Whales: Evidence and Cultural Implications. *Behavior and Brain Science* 24(2):346-347.
- Mobley, J.R., Jr. S. Spitz, K.A. Forney, R. Grotefendt., and P.H. Forestell. 2000. Distribution and abundance of odontocete species in Hawaiian waters: Preliminary results of 1993-98 aerial surveys. *SWFSC Admin. Rept.* LJ-00-14C. 26 pp.
- Nachtigal, P., W. Au, J. Pawloski, K. Andrews and C. Oliver. 2000. Measurements of the low frequency components of active and passive sounds produced by dolphins. *SWFSC Admin. Rept.* LJ-00-07C. 20 p.
- Nachtigal, P.E., W.W.L. Au., J.L. Pawloski, K. Andrews and C. W. Oliver. 2000. Measurements of the low frequency components of active and passive sounds produced by dolphins. *Aquatic Mammals* 26(3):167-174.
- Norris, T., J. Jacobsen, and S. Cerchio. 2000. A comparative analysis of humpback whale songs recorded in pelagic waters of the eastern North Pacific: Preliminary findings and implications for discerning migratory routes and assessing breeding stock identity. *NOAA Technical Memorandum NOAA-TM-NMFS-SWFSC-295*. 29 p.
- Olson, P.A., R.L. Pitman, L.T. Ballance, and S.B. Reilly. 2000. Summary of seabird, marine turtle, and surface fauna data collected during a survey in the eastern tropical Pacific Ocean July 30 - December 9, 1998. *NOAA Technical Memorandum NOAA-TM-NMFS-SWFSC-298*. 69p.
- Olson, P.A., R.L. Pitman, L.T. Ballance, K.R. Hough, P. Dutton and S.B. Reilly. 2001. Summary of seabird, marine turtle, and surface fauna data collected during a survey in the eastern tropical Pacific Ocean, July 28-December 9, 1999. *NOAA Technical Memorandum NOAA-TM-NMFS-SWFSC-301*. 55 p.
- Olson, P.A., R.L. Pitman, L.T. Ballance, K.R. Hough, P. Dutton and S.B. Reilly. 2001. Summary of seabird, marine turtle, and surface fauna data collected during a survey in the eastern tropical Pacific Ocean, July 28-December 9, 2000. *NOAA Technical Memorandum NOAA-TM-NMFS-SWFSC-304*. 58 p.
- Pabst, D.A., W.A. McLellan, S.A. Rommel, T.K. Rowles, R.S. Wells, T.M. Williams, and Andrew J. Westgate. 2000. Final report. Measuring surface and deep body temperatures of dolphins in the eastern tropical Pacific: Is thermal stress associated with chase and capture in the ETP-tuna purse-seine fishery? *SWFSC Admin. Rept.* LJ-00-13C.
- Perryman, W.L., M.A. Donahue, P.C. Perkins and S.B. Reilly. 2002. Gray whale calf production 1994-2000: Are observed fluctuations related to changes in seasonal ice cover? *Marine Mammal Science* 18(1):121-144.
- Perkins, P.C. 2000. The feasibility of using tuna vessel observer data to estimate trends in dolphin abundance. *SWFSC Admin. Rept.* LJ-00-03. 18 p.
- Pitman, R.L. and M. Lynn. 2001. Biological observations of an unidentified *mesoplodon* whale in the eastern tropical Pacific and probable identity: *Mesoplodon peruvianus*. *Marine Mammal Science* 17(3):648-657.
- Pitman, R. L., Ballance, L. T., Mesnick, S. L. and Chivers, S. 2001. Killer whale predation on sperm whales: observations and implications for large whale biology. *Marine Mammal Science* 17(3):494-507.
- Ralls, K. and B.L. Taylor. 2000. Special Section: Better policy and management decisions through explicit analysis of uncertainty: approaches from marine conservation. *Conservation Biology*: 1240-1242.
- Rosenbaum, H.C., R.L. Brownell, Jr., M.W. Brown, C. Schaeff, V. Portway, B.N. White, S. Malik, L.A. Pastene, N.J. Patenaude, C.S. Baker, M. Goto, P.B. Best, P.J. Clapham, P. Hamilton, M. Moore, R. Payne, V. Rowntree, C.T. Tynan, J.L. Bannister, and R. DeSalle. 2000. World-wide genetic differentiation of *Eubalaena*: questioning the number of right whale species. *Molecular Ecology* 9:1793-1802.
- Rosenbaum, H.C., M.G. Egan, P.J. Clapham, R.L. Brownell, Jr., S. Malik, M. Brown, B.N. White, P. Walsh, and R. DeSalle. 2000. Utility of North Atlantic right whale museum specimens for assessing changes in genetic diversity. *Conservation Biology* 14(6):1837-1842.
- Rosenberg, A. and S. Mesnick. 2001. The cetacean XFX and ZFY genes: Interfamilial characterization of a novel region facilitates gender determination. *SWFSC Admin Rept.* LJ-01-01. 18 pp.
- Rugh, D.J., Shelden, K.E.W., and Schulman-Janiger, A. 2001. Timing of the southbound migration of gray whales. *J. Cetacean Res. and Manage.* 3(1):31-39.
- Schaefer, K.M. and C.W. Oliver. 2000. Shape, volume and resonance frequency of the swimbladder of yellowfin tuna (*Thunnus albacares*). *Fish.Bull.* 98(2):364-374.
- Shelden, K.E.W., DeMaster, D.P., Rugh, D.J., and Olson, A.M. 2001. Developing classification criteria under the U.S. Endangered Species Act: bowhead whales as case study. *Conservation Biology* 15(5): 1300-1307.

- Sisson, J, and E. Edwards. 2000. Consultation between NMFS and non-governmental organizations regarding a potential chase/recapture experiment: Meeting report. *SWFSC Admin. Rept.* LJ-00-04. 24p.
- Slooten, E., D. Fletcher, and B. Taylor. 2000. Accounting for uncertainty in risk assessment: Case study of Hector's dolphin mortality due to gillnet entanglement. *Conservation Biology* 1264-1270.
- Spear, L.B., L.T. Ballance, and D.G. Ainley. 2001. Response of seabirds to thermal boundaries in the tropical Pacific: the thermocline versus the Equatorial Front. *Marine Ecology Progress Series* 219:275-289.

- Stein, J.E., Tilbury, K.L., Meador, J.P., Gorzelany, J., Worthy, G.A.J., and Krahn, M.M. In press. Ecotoxicological investigations of bottlenose dolphin (*Tursiops truncatus*) strandings: accumulation of persistent organic chemicals and metals. In *Toxicology of Marine Mammals*, (Bossart, G., Fournier, M., O'Shea, T., and Vos, J., eds.) Taylor and Francis, Philadelphia, PA.
- Swartz, S. L., A. Martinez, T. Cole, P. J. Clapham, M. A. McDonald, J. A. Hildebrand, E. M. Oleson, C. Burks, and J. Barlow. 2001. Visual and acoustic survey of humpback whales (*Megaptera novaeangliae*) in the eastern and southern Caribbean Sea: Preliminary Results. *NOAA Tech. Mem. NMFS-SEFSC-456*. 37pp.
- Taylor, B. L., P. R. Wade, D. P. DeMaster, and J. Barlow. 2000. Incorporating uncertainty into management models for marine mammals. *Conservation Biology* 14:1243-1252.
- Taylor, B. L., S. J. Chivers, S. Sexton and A. E. Dizon. 2000. Estimating dispersal rates using mitochondrial DNA data and incorporating uncertainty. *Conservation Biology* 14:1287-1297.
- Taylor, B. L. and P. Wade. 2000. "Best" abundance estimates and best management: why they are not the same. In: (Ferson, S. and Burgman, M. Eds.) Quantitative Methods for Conservation Biology. Springer-Verlag, New York, New York.
- Taylor, B. L., Wade, P.R., Ramakrishnan, U., Gilpin, M. and Akçakaya H.R. (In Press). Incorporating uncertainty in PVAs for the purpose of classifying species by risk. In Population Viability Analysis. Eds. S.R. Beissinger and D.R. McCollough.
- Thode, A., T. Norris, and J. Barlow. 2000. Frequency beamforming of dolphin whistles using a sparse three-element towed array. *J. Acoust. Soc. Am.* 107(6):3581-3584.
- Tilbury K.L., Stein J.E., Krone C.A., Brownell, Jr., R.L., Blokhin S.A., Bolton J.L. and Ernest D.W. In press. Chemical contaminants in juvenile gray whales (*Eschrichtius robustus*) from a subsistence harvest in Arctic feeding grounds. *Chemosphere*.
- Tynan, C.T., DeMaster, D.P. and Peterson, W.T. 2001. Endangered right whales on the southeastern Bering Sea shelf. *Science* 294: 1894.
- Urbán R., J., Jaramillo L., A., Aguayo L., A., Ladrón de Guevara P., P., Salinas Z., M., Alvarez F., C., Medrano G., L., Jacobsen, J.K., Balcomb, K.C., Claridge, D.E., Calambokidis, J., Steiger, G.H., Straley, J.M., von Ziegeler, O., Waite, J.M., Mizroch, S., Dahlheim, M.E., Darling, J.D., and Baker, C.S. 2000. Migratory destinations of humpback whales wintering in the Mexican Pacific. *J. Cetacean Res. Manage.* 2(2):101-110.
- Waite, J.M., Friday, N.A., and Moore, S.E. In press. Killer whale (*Orcinus orca*) distribution and abundance in the central and southeastern Bering Sea, July 1999 and June 2000. *Marine Mammal Science*.
- Weller, D.W., and Brownell, R.L., Jr. 2000. Gray whale, *Eschrichtius robustus*: Asian or Western Pacific Population. In: The World Conservation Union (IUCN) Species Survival Commission 2000 Red List of Threatened Species. Gland, Switzerland.
- Weller, D.W., Würsig, B., Lynn, S.K., and Schiro, A.J. 2000. Preliminary findings on the occurrence and site fidelity of photo-identified sperm whales (*Physeter macrocephalus*) in the northern Gulf of Mexico. *Gulf of Mexico Science*, 1:35-39.
- Weller, D.W., and Würsig, B. (In Press). Bottlenose dolphins of Aransas Pass, Texas: Annual and seasonal patterns of occurrence, site fidelity, and behavior. *Fishery Bulletin*
- Weller, D.W. (In Press). Book Review -- Cetacean societies: Field studies of whales and dolphins. Eds. J. Mann, R.C. Connor, P.L. Tyack, & H. Whitehead. *Animal Behaviour*.
- Ylitalo, G.M., Matkin, C.O., Buzitis, J., Krahn, M.M., Jones, L.L., Rowles, T., and Stein, J.E. In press. Influence of life-history parameters on organochlorine concentrations in free-ranging killer whales (*Orcinus orca*) from Prince William Sound, AK. *Sci. Total Environ* 281: 183-203.
- Zorn, H.M. J.H. Churnside, and C.W. Oliver. 2000. Laser safety thresholds for cetaceans and pinnipeds. *Mar. Mamm. Sci.* 16(1):186-202.

10.2 Unpublished Literature

- Batchelder, H.P., Barth, J.A., Kosro, P.M., Strub, P.T., Brodeur, R.D., Peterson, W.T., Tynan, C.T., Ohman, M.D., Botsford, M.D., Powell, T.M., Schwing, F.B., Ainley, D.G., Mackas, D.L., Hickey, B.M. and Ramp, S.R. (submitted, in review). The GLOBEC Northeast Pacific California Current System Program. *Oceanography*.
- Calambokidis, J., Steiger, G.H., Straley, J.M., Herman, L.M., Cerchio, S., Salden, D.R., Urbán R., J., Jacobsen, J.K., von Ziegeler, O., Balcomb, K.C., Gabriele, C.M., Dahlheim, M.E., Uchida, S., Ellis, G., Miyamura, Y., Ladrón de Guevara P., P., Yamaguchi, M., Sato, F., Mizroch, S.A., Schlender, L., Rasmussen, K., and Barlow, J. (submitted, in review). Movements and population structure of humpback whales in the North Pacific Basin. *Mar. Mammal Sci.*
- Friday, N. and Smith, T.D. In review. The Effect of Age and Sex Selective Harvest Patterns for Baleen Whales. Submitted to *Journal of Cetacean Research and Management*
- Krahn M.M., Ylitalo, G.M., Stein, J.E., Aguilar, A. and Borrell, A. (submitted, in review). Organochlorine contaminants in cetaceans: how to avoid errors when comparing datasets. *J. Cetacean Res. Manage*
- Mizroch, S.A., Herman, L.M., Straley, J.M., Glockner-Ferrari, D., Jurasz, C., Darling, J.D., Cerchio, S., Gabriele, C.M., Salden, D.R., and von Ziegeler, O. In review. Estimating the adult survival rate of Central North Pacific humpback whales.
- Moore, S.E., Waite, J.M., Friday, N.A., and Honkalehto, T. In review. Distribution and Comparative Estimates of Cetacean Abundance on the Central and South-Eastern Bering Sea Shelf with Observations on Bathymetric and Prey Associations. Submitted to *Progress in Oceanography*.
- Tynan, C.T. (submitted, in review). Ecological importance of cetaceans on the Southeastern Bering Sea shelf: Changes in carbon flow to large whales. *Mar. Ecol. Prog. Ser.*
- Tynan, C.T. Distribution and abundance of killer whales *Orcinus orca* on the Southeastern Bering Sea shelf and slope during summer 1997 and 1999. Report submitted to the North Pacific Fishery Management Council, May 2001, 11 pp.
- Tynan, C.T. and DeMaster, D.P. 2000. Recent trends, observations, and predictions of Arctic climate change. 6 p. International Whaling Commission, Scientific Committee document SC/52/E 7.
- Ylitalo, G.M., Krahn, M.M., Yanagida, G.K., Gulland, F.M.D., Calambokidis, J., Gearin, P., Gosho, M., Norberg, B., Duffield, D., Holahan, P., Stein, J.E. and Rowles, T. Supplement to: organochlorine contaminant concentrations and lipid profiles in eastern North Pacific gray whales (*Eschrichtius robustus*). 12 p. International Whaling Commission, Scientific Committee document SC/53/E 4.