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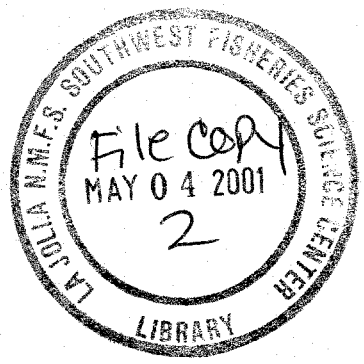

AUGUST 1999

A REPORT OF THE OREGON, CALIFORNIA AND WASHINGTON LINE-TRANSECT EXPERIMENT (ORCAWALE) CONDUCTED IN WEST COAST WATERS DURING SUMMER/FALL 1996

Alexandra Von Saunder
Jay Barlow

NOAA-TM-NMFS-SWFSC-264

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Southwest Fisheries Science Center

NOAA Technical Memorandum NMFS

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U.S. DEPARTMENT OF COMMERCE
William M. Daley, Secretary
National Oceanic and Atmospheric Administration
D. James Baker, Under Secretary for Oceans and Atmosphere
National Marine Fisheries Service
Penelope D. Dalton, Assistant Administrator for Fisheries

A Report of the Oregon, California and Washington Line-Transect Experiment (ORCAWALE) Conducted in West Coast Waters during Summer/Fall 1996

(*McArthur* Cruise Number: AR-96-07, SWFSC Cruise Number: 1604
***David Starr Jordan* Cruise Number: DS-96-10, SWFSC Cruise Number: 1605)**

Alexandra Von Saunder and Jay Barlow

INTRODUCTION

This report summarizes information collected on a survey of marine mammals off the contiguous west coast of the United States aboard the National Oceanographic and Atmospheric Administration (NOAA) research ships *McArthur* and *David Starr Jordan* during three months in the summer/fall of 1996. The primary purposes of this research were to estimate the abundance of and to describe the distribution of dolphins, whales, and porpoises in the coastal waters of the eastern Pacific Ocean out to 300 nautical miles and to compare passing and closing search modes. This research was sponsored by the National Marine Fisheries Service's Southwest Fisheries Science Center (SWFSC) and Office of Protected Resources.

In addition to the primary mission of determining cetacean abundances, several ancillary projects were included. Photographs were taken for the identification of individual whales and projectile biopsy samples were taken for genetic analysis of cetacean population structure. Dive-interval studies were conducted on sperm whales, Baird's beaked whales, and blue whales. Oceanographic data were collected to better understand cetacean habitats and the physical environment of the study area. A seabird survey was also conducted. This report describes the experimental procedures and summarizes the cetacean observations made during this project. Separate reports will be published which will describe the oceanographic and seabird studies completed during the survey. Barlow (1997) presents preliminary estimates of cetacean abundances from this survey.

METHODS

Survey Methods

The survey was conducted between 17 July and 06 November, 1996 on two NOAA research vessels: the *McArthur* (53.3 meters in length, 11.6 meters in breadth, and 3.7 meters in draft) and the *David Starr Jordan* (52.1 meters in length, 11.2 meters in breadth, and 3.8 meters in draft). The ships maintained a cruising speed of approximately 10 knots while surveying a grid of predetermined tracklines that uniformly covered the study area (Fig. 1). When weather was too rough or visibility too poor for visual observation effort, the ships either waited for calmer seas in the same location or transited to another area where weather was predicted to be better. The ships subsequently returned to these bad weather locations, several times if necessary, to complete survey effort in those

areas. At night, the ships would typically stop steaming where visual effort ended for the day and stay in that same location until sunrise and the beginning of effort for the next day. Sometimes during the nights, the ships would conduct transects perpendicular to the previous day's effort to obtain more complete surface oceanographic measurements and acoustic backscatter measurements. The cruise consisted of three thirty-day legs for *McArthur* and two thirty-day legs for *David Starr Jordan*[1]. Due to a mechanical breakdown on *McArthur* and adverse weather conditions experienced on both ships, operations were not conducted on all of the scheduled sea days (Table 1).

Search effort on each ship consisted of the rotation of visual observers through four observation stations that has been used on many previous SWFSC marine mammal surveys (Hill and Barlow 1992; Mangels and Gerrodette 1994) during daylight hours (approximately from 0630L to 1730L but varying due to season). The four observation stations were located on the flying bridge deck at a height of 10.7 meters above the sea surface, allowing a maximum ship-to-horizon sighting distance of about six nautical miles from either ship. The visual observer stations on each ship consisted of two observers searching for cetaceans with pedestal-mounted Fujinon[2] 25X binoculars (on the port and starboard sides), a data recorder who searched by naked eye and with 7X binoculars (positioned amidship), and an independent observer. The independent observer kept a separate watch by naked eye and with 7X binoculars but did not announce the presence of cetaceans until they had passed abeam and were clearly missed by the other observers. The purpose of the independent observer position was to determine the percentage of marine mammals on the survey lines that were not seen by the three-person watch team (Barlow 1995). The data recorder logged the sighting cue, bearing, distance from the ship, and species for each sighting using a computer program (WinCRUZ) on a laptop computer linked to the ships' GPS (Global Positioning System) for navigational data. Data on weather and sighting conditions were also recorded on this laptop.

The marine mammal survey was conducted in two modes to compare the population estimates obtained from each type. When a cetacean school was sighted in "closing mode" , the observer team leader requested that the ship approach the school and/or slow in speed so that observers could identify the animals and estimate school size and species composition. Generally, all cetaceans encountered within three nautical miles of the trackline were approached if necessary to determine species and group size. This mode allows the observer team to make a more precise count of the animals in each group and better identify the species. In "passing mode" the ship did not deviate from the trackline to approach the animals sighted. Instead, the observers made group-size estimates and identified the species from the trackline as the ship passed, thus allowing more complete and continuous coverage of the survey lines. Passing mode was abandoned for three species of special interest (sperm whales, Baird's beaked whales, and pilot whales) which were always approached as

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[1]Dates of each leg and port call locations are given in the separate Cruise Reports for each ship available from the Southwest Fisheries Science Center, P.O. Box 271, La Jolla, CA 92038.

[2]Mention of brand names does not imply endorsement by the National Marine Fisheries Service.

in closing mode. Throughout the cruise, visual survey effort consisted of cycles of two days in closing mode followed by one day of passing mode.

Individual identification photographs and genetic biopsies were taken when time permitted. Black and white photographs were taken using 35mm cameras with 100-400mm lenses for individual identification studies. These photographs were later added to SWFSC photo catalog, and copies of photographs of blue, humpback and killer whales were provided to other researchers who maintain photo-ID catalogs for those species. Bolts with special tips were shot from crossbows to extract skin biopsy samples from animals, when possible, for genetic studies of stock structure. Approximately 165 biopsy samples were preserved in a solution of saline and DMSO, were added to the extensive collection of genetic samples at SWFSC, and will be analyzed when studies are initiated for the given species. When certain large whale species were encountered, the cruise leader evaluated factors (ie. whether sea conditions were sufficiently calm and whether sufficient time existed before sunset) to determine whether dive interval studies could be initiated and whether a small boat (a Rigid-Hulled Inflatable Boat - RHIB) could be launched from the ship to obtain individual-identification photographs or biopsy samples.

Because the frequent recording of pinniped sightings detracted from the recorder's cetacean survey effort in areas with high pinniped density, pinnipeds were omitted from sighting records when the ships were within 10 nmi of the coast. Transects do, however, provide a good measure of relative pinniped abundance along all the transect lines that were surveyed farther than 10 nmi offshore.

Dive Interval Methods

Visual dive interval studies were conducted when whales of interest were sighted under acceptable viewing conditions. These studies allow the estimation of correction factors for abundance estimates of long-diving whales by determining what percentage of the animals' time is spent under water, where they cannot be seen or counted during visual surveys (Barlow and Sexton 1996; Barlow 1999). Dive studies were only initiated if viewing conditions allowed for a high probability of re-sighting the group; suitable conditions were evaluated based on characteristics of the species, sea state, and swell height (Table 1 in Barlow et al. 1997) as well as light levels and available day length. Dive studies were terminated if sighting conditions deteriorated to the extent that animals were not likely to be reliably re-sighted, or if a species-specific maximum time limit had been exceeded since the last sighting (and the animals were assumed to have been lost). On this cruise, successful dive-interval data were collected for sperm whales on the *Jordan* and for sperm whales, Baird's beaked whales, and blue whales on the *McArthur*.

During the course of the dive interval studies, the vessel was held at a distance of 0.5 - 1.0 nmi from the last known position of the animals or from the anticipated position of a regularly traveling group (Barlow et al. 1997). Visual observers conducted the dive interval studies from the flying bridge of the ships. The number of active observers always included the three on-duty observers plus a dedicated data recorder. In some cases, 1-3 additional observers searched on an opportunistic

basis, generally in the direction of the projected next surfacing location. Dive data were typically recorded by one person reciting information about surfacings and blows into the microphone of a DAT (Digital Audio Tape) recorder. For one sperm whale sighting on the Jordan (#255), whale blows were recorded using a time-event recorder program written by Barb Taylor. A complete dive cycle consisted of a surfacing, the animals' dive, and the next surfacing. Generally, two dive cycles were monitored before other activities (eg. biopsy) were attempted.

Acoustic Methods

On *McArthur*, after the dive cycle of a group of sperm whales had been monitored through two full dives, a hydrophone attached to the CTD frame was deployed to 1000 m depth to gather data on the distance from which sperm whales can be acoustically detected. Hydrophones mounted in the hull of *McArthur* were used to record dolphin vocalizations for individuals that were bow-riding or approaching the ship. All cetacean sounds were recorded with a DAT recorder.

RESULTS

Effort and Sightings

A total of 14,592 km of tracklines were surveyed in line-transect mode ("on-effort") during 114 survey days (Table 1, Figure 1). One-sixth of this effort was in excellent survey conditions (Beaufort Sea State 2 or lower), but these conditions accounted for almost one half (47%) of the sightings (Table 2). A total of 1,105 "on-effort" sightings (useful for abundance estimation) and 203 "off-effort" sightings (useful for studies of distribution) were made during the survey (Figures 2-7). In rank order of sighting frequency, the most common small cetaceans were Dall's porpoise, short-beaked common dolphin, Risso's dolphin, harbor porpoise, and Pacific white-sided dolphin (Table 3). The most common medium-sized whales were mesoplodont beaked whale, minke whale, killer whale, Baird's beaked whale, and Cuvier's beaked whale (Table 3). The most common large whales were blue whale, fin whale, humpback whale, and sperm whale (Table 3). A variety of cetaceans were seen in mixed-species groups (63 of the total sightings were mixed school sightings), most notably short-beaked common dolphins and striped dolphins, Pacific white-sided dolphins and California sea lions, and Pacific white-sided dolphins and northern right whale dolphins (Table 4). Sighting rates for each individual observer (Table 5) are presented in Table 6. A more complete record of all sightings (stratified by species) is presented in Table 7.

Photographs from 89 sightings of cetaceans were catalogued in a database at SWFSC for future analysis of individual identification and stock studies. The photographic record is available to researchers at other agencies and institutions.

Dive Interval Observations

Dive and surface interval measurements were made for sperm whales (on 5 occasions), for Baird's beaked whales (on 3 occasions), and for blue whales (on 3 occasions) (Table 8). The groups of Baird's beaked whales typically dove and surfaced synchronously. For the other species, groups were typically divided into subgroups whose members were diving synchronously with other members of that subgroup but were not synchronous with members of other subgroups. One group of sperm whales (Mac #21) was unusual in that it showed no dives (periods without visible blows) longer than 1 minute and was traveling, relatively rapidly, near the surface for an hour and a half (approximately 4 kts on a course of NNW). Another sperm whale sighting consisted of a solitary individual whose three consecutive dives were all (like clockwork) between 37 and 38 minutes.

Acoustic Detection

When hydrophones were lowered to 1000 m on the CTD cable, sperm whales that were seen to be one to two nautical miles away could not be heard. This appeared to be due to excessive background noise produced by the CTD rosette and cables. This experiment was terminated after Leg 2.

DISCUSSION

Marine Mammal Sightings

This is the largest and most comprehensive marine mammal survey completed off the U.S. west coast. It included waters within 300 nmi of California, which were surveyed previously in 1991 and 1993 (Hill and Barlow 1992; Mangle and Gerrodette 1994), but added offshore waters of Oregon and Washington that had never been the subject of a systematic shipboard marine mammal survey. Most species were seen along the entire coastline, but some showed distinct north/south patterns. Common dolphins and blue whales were seldom seen north of 42°N and northern right whale dolphins were seldom seen south of 40°N. In preliminary analyses, sighting and effort data from this survey have already provided a better picture of cetacean abundance in the survey area than was previously available (Barlow 1997).

Dive Interval Data

Data on dive and surface intervals collected on this cruise can be used with models (Barlow and Sexton 1996; Barlow 1999) to predict the probability of missing a diving whale during line-transect surveys. We caution, however, that dive and surface times are likely to be biased and should not be accepted without caveats. Dive times are likely to be overestimated because the first blows of a surfacing series are not always seen and, more importantly, because surfacing series are often missed completely, resulting in dive times that are estimated to be more than twice the actual dive times. Surface times are likely to be underestimated, again because the first blows in a surfacing series are often missed. Modal and median dive times may be less biased than mean dive times (Barlow 1999).

Although considerable data have been collected on the dive times of individual sperm whales, there is a general lack of information on the collective dive patterns of groups of sperm whales. On this cruise, we found that for asynchronously diving groups, the maximum period of time when no blows were visible is often very short. Such groups are unlikely to be missed using our standard line-transect methods with 25X binoculars. Solitary individual sperm whales are much more likely to be missed. We recorded several apparent dives of Baird's beaked whales that exceeded 40 minutes, but in every case the observer's notes indicated that they thought they could have missed one or more surfacing series. Only after many dive times are recorded can the modal dive times be estimated for this species.

Acoustic Detection

Sperm whale recordings from the CTD hydrophone were disappointing due to its very limited detection range of sperm whales clicks. It was hoped that getting a hydrophone into the deep sound channel (SOFAR channel, Richardson et al. 1995) would greatly increase the range of detection over a near-surface hydrophone (which can routinely detect sperm whales at 2 nmi range). The greatest problem was the strumming of the CTD cable and the clanking of various parts of the CTD rosette. Clearly if this method is to be given a fair test, an attempt needs to be made to reduce the background noise coming from the CTD.

ACKNOWLEDGMENTS

This survey was the culmination of work by many people. We especially want to thank all of the cruise participants including crew and officers of both ships. This report was improved by reviews from Lisa Baraff, Jim Carretta, Karin Forney, and Janice Waite.

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TABLE 1: ORCAWALE Kilometers of Effort By Day - *David Starr Jordan* conducted 47 days of on-effort observation. *McArthur* conducted 64 days of on-effort observation.

Date	McArthur	Jordan
18 Jul 96	164.8	.0
19 Jul 96	23.2	.0
20 Jul 96	186.6	.0
21 Jul 96	111.7	.0
22 Jul 96	3.5	.0
26 Jul 96	54.3	.0
27 Jul 96	193.5	.0
28 Jul 96	233.5	.0
29 Jul 96	237.7	.0
31 Jul 96	151.5	.0
1 Aug 96	74.6	.0
3 Aug 96	26.7	.0
4 Aug 96	53.2	.0
5 Aug 96	33.5	.0
6 Aug 96	234.9	.0
7 Aug 96	182.0	.0
8 Aug 96	167.0	.0
9 Aug 96	215.3	.0
10 Aug 96	212.0	.0
11 Aug 96	224.1	.0
12 Aug 96	224.6	.0
13 Aug 96	130.3	.0
14 Aug 96	115.1	.0
20 Aug 96	109.2	.0
25 Aug 96	151.2	.0
26 Aug 96	179.4	.0
27 Aug 96	186.7	.0
28 Aug 96	198.1	.0
30 Aug 96	186.5	.0
31 Aug 96	193.6	.0
1 Sep 96	11.6	.0
2 Sep 96	214.4	.0
3 Sep 96	154.6	.0
4 Sep 96	187.1	32.5
5 Sep 96	226.7	58.5
6 Sep 96	.0	117.7
7 Sep 96	151.5	162.9
8 Sep 96	143.0	77.3
9 Sep 96	233.9	77.0
10 Sep 96	174.6	193.6
11 Sep 96	172.4	142.0
12 Sep 96	51.1	66.5
13 Sep 96	.0	202.7
14 Sep 96	175.8	121.9
15 Sep 96	.0	136.3
16 Sep 96	90.8	37.6
17 Sep 96	167.1	.0
18 Sep 96	.0	34.9
19 Sep 96	.0	30.5
20 Sep 96	.0	107.5
21 Sep 96	.0	70.6
23 Sep 96	107.0	135.5
24 Sep 96	189.4	137.7
26 Sep 96	75.2	.0
27 Sep 96	131.0	.0
28 Sep 96	96.1	65.5
29 Sep 96	186.4	125.1
30 Sep 96	192.8	188.5
1 Oct 96	110.5	151.8
2 Oct 96	199.5	140.0
3 Oct 96	29.9	.0
4 Oct 96	24.8	.0
5 Oct 96	34.7	.0
7 Oct 96	49.3	.0
8 Oct 96	179.4	.0
9 Oct 96	146.7	.0
10 Oct 96	189.1	159.2
11 Oct 96	194.3	172.1
12 Oct 96	101.6	30.9
13 Oct 96	74.0	41.6
14 Oct 96	111.8	142.9
15 Oct 96	.0	130.8
16 Oct 96	.0	180.3
17 Oct 96	.0	167.7
20 Oct 96	.0	58.8
21 Oct 96	.0	76.9
22 Oct 96	.0	145.6
23 Oct 96	.0	149.0
24 Oct 96	.0	115.8
25 Oct 96	.0	43.7
27 Oct 96	.0	178.2
28 Oct 96	.0	141.1
29 Oct 96	.0	165.4
30 Oct 96	.0	151.8
31 Oct 96	.0	135.7
1 Nov 96	.0	160.2
2 Nov 96	.0	76.8
3 Nov 96	.0	177.6
4 Nov 96	.0	139.4
Total	9036.1	5555.7

TABLE 2: ORCAWALE Survey Effort By Sea State Record - The sighting rates for on-effort sightings are listed by Beaufort Sea State.

Beaufort Sea State	Kilometers of effort	No. of sightings	Sightings per 1000 km
0	59.9	11	183.76
1	748.0	296	395.71
2	1288.8	211	163.72
3	3591.9	270	75.17
4	5087.9	223	43.83
5	3655.1	89	24.35
6	160.2	5	31.21
Total	14591.8	1105	Mean 152.96

TABLE 3: Sighting Summary - A list summarizing all species sighted and number of times each species was sighted on the cruise.

Species Code	Name	# Schools Sighted Pure	Mixed	Total	Average School Size
05	*Delphinus* (unid. spp.)	16	3	19	106.1
13	*Stenella coeruleoalba*	3	11	14	11.3
16	*Delphinus capensis*	5	1	6	471.2
17	*Delphinus delphis*	100	21	121	113.5
18	*Tursiops truncatus*	1	4	5	2.2
21	*Grampus griseus*	24	8	32	19.6
22	*Lagenorhynchus obliquidens*	16	25	41	109.3
27	*Lissodelphis borealis*	6	16	22	50.1
36	*Globicephala macrorhynchus*	1	1	2	8.8
37	*Orcinus orca*	8	1	9	3.9
40	*Phocoena phocoena*	20	0	20	1.6
44	*Phocoenoides dalli*	224	3	227	3.4
46	*Physeter macrocephalus*	29	0	29	2.9
51	*Mesoplodon* spp.	12	0	12	1.6
61	*Ziphius cavirostris*	7	0	7	1.5
63	*Berardius bairdii*	8	0	8	2.1
70	*Balaenoptera* spp.	57	5	62	1.3
71	*Balaenoptera acutorostrata*	9	0	9	1.0
74	*Balaenoptera physalus*	72	5	77	1.5
75	*Balaenoptera musculus*	100	5	105	1.4
76	*Megaptera novaeangliae*	70	2	72	1.9
77	unid. dolphin	52	3	55	16.8
78	unid. small whale	15	0	15	1.4
79	unid. large whale	24	0	24	1.4
80	*Kogia simus/breviceps*	1	0	1	1.0
96	unid. cetacean	7	0	7	2.0
97	unid. object	3	0	3	1.0
98	unid. whale	1	0	1	1.0
PU	unid. pinniped	58	2	60	1.1
UO	unid. sea lion	28	0	28	1.0
EJ	*Eumetopias jubatus*	1	2	3	1.2
ZC	*Zalophus californianus*	83	16	99	3.4
UA	unid. fur seal	2	0	2	1.0
CU	*Callorhinus ursinus*	98	1	99	1.1
MA	*Mirounga angustirostris*	84	0	84	1.0

TABLE 4: Schools of Mixed Species Composition - The following sightings included more than one species.

Species 1	Species 2	Species 3	Species 4	Total
16 *D. capensis*	EJ *E. jubatus*			1
17 *D. delphis*	05 *Delphinus* spp.			2
17 *D. delphis*	13 *S. coeruleoalba*			11
17 *D. delphis*	77 unid. dolphin			1
17 *D. delphis*	PU unid. pinniped			1
17 *D. delphis*	EJ *E. jubatus*	05 *Delphinus* spp.		1
17 *D. delphis*	ZC *Z. californianus*			4
21 *G. griseus*	18 *T. truncatus*			3
21 *G. griseus*	77 unid. dolphin			1
22 *L. obliquidens*	21 *G. griseus*			1
22 *L. obliquidens*	27 *L. borealis*	44 *P. dalli*		1
22 *L. obliquidens*	27 *L. borealis*			9
22 *L. obliquidens*	27 *L. borealis*	ZC *Z. californianus*	44 *P. dalli*	1
22 *L. obliquidens*	ZC *Z. californianus*			11
27 *L. borealis*	21 *G. griseus*	22 *L. obliquidens*		1
27 *L. borealis*	21 *G. griseus*			2
27 *L. borealis*	77 unid. dolphin			1
36 G. macrorhynchus	18 *T. truncatus*			1
37 *O. orca*	44 *P. dalli*			1
70 unid. rorqual	74 *B. physalus*			1
74 *B. physalus*	22 *L. obliquidens*			1
74 *B. physalus*	70 unid. rorqual	27 *L. borealis*		1
74 *B. physalus*	75 *B. musculus*			1
75 *B. musculus*	70 unid. rorqual			2
76 *M. novaeangliae*	74 *B. physalus*	75 *B. musculus*		1
76 *M. novaeangliae*	75 *B. musculus*	70 unid. rorqual		1
CU *C. ursinus*	17 *D. delphis*	PU unid. pinniped		1
		TOTAL MIXED SIGHTINGS		63

Table 5: Observer Numbers for ORCAWALE - The names of the marine mammal observers are listed by observer number.

Observer Number	Name	Observer Number	Name
004	Pitman, Robert	144	Palacios, Daniel
015	Barlow, Jay	145	Stinchcomb, Charles
034	Taylor, Barbara	146	Grace, Geoff
071	Carretta, James	147	Rasmussen, Kristin
073	Rowlett, Richard	148	Peterson, Jon
074	Smith, Brian	149	Morse, Laura
084	Gerrodette, Tim	150	Corkeron, Peter
086	Forney, Karin	151	Alvarez, Carlos
091	Kinzey, Douglas	152	Baraff, Lisa
092	Olson, Paula	153	Norman, Stephanie
098	Force, Michael	154	Perry, Simona
113	Waite, Janice	155	Harding, Heather
120	Ballance, Lisa	156	Ellifrit, David
138	Raum-Suryan, Kimberly	157	Randel, April
143	Pusser, Todd		

TABLE 6: Observer Sighting Rates for ORCAWALE 96 - The number of sightings and kilometers of survey effort are listed for each observer, by observer number. See Table 5 for a listing of observer numbers. Caution should be used in interpreting sighting rates to control for difference between ships and differences in sighting methods (regular observers vs. independent observers).

Observer Number	Kilometers Of Effort	No. of Sightings	Sightings Per 1000 km
73	4480.2	160	35.71
74	4503.4	135	29.98
91	4504.4	75	16.65
92	4317.2	80	18.53
138	2735.3	56	20.47
143	4530.5	147	32.45
145	4458.8	124	27.81
148	3854.7	58	15.05
149	2408.3	53	22.01
152	2742.5	36	13.13
153	2735.0	24	8.78
154	2723.4	29	10.65
4*	1580.5	44	27.84
15*	705.7	10	14.17
34*	591.3	11	18.60
71*	674.2	4	5.93
84*	414.4	0	.00
86*	767.5	7	9.12
113*	1165.6	20	17.16
144*	1428.2	12	8.40
147*	882.4	2	2.27
150*	1485.1	8	5.39
151*	1101.5	4	3.63
155*	736.1	6	8.15
156*	861.9	0	.00
157*	854.0	0	.00

TOTAL NO. OF SIGHTINGS (on+off effort) = 1308

* Independent observers

Table 7: ORCAWALE Marine Mammal Sighting Record - The Table is ordered by species code and sighting number. "Other Codes" are the codes of other species in a mixed-species school. Time is listed in local time, and latitude and longitude are the location of the school at the time of the sighting. School size is the average of all observers' best estimates. All sightings made aboard the *McArthur* are designated with the letter "M" and all sightings made aboard the *David Starr Jordan* are designated with the letter "J".

Species name Code	Other Codes	Sighting Number	Date	Time	Latitude	Longitude	Bft.	Obs. no.	School size	Effort
Delphinus (unid. spp.)										
05	17	J 2	4 Sep 96	1554	N32:49.92	W117:24.03	4	154	28	On
05	17	J 11	5 Sep 96	1115	N33:20.56	W118:57.57	1	92	270	On
05		J 116	10 Sep 96	736	N34:33.64	W121:14.34	2	92	10	On
05		M 301	20 Aug 96	1057	N32:58.32	W117:18.20	2	143	225	Off
05		M 303	20 Aug 96	1226	N33:05.26	W117:25.55	3	145	30	On
05		M 304	20 Aug 96	1252	N33:05.28	W117:29.73	4	150	18	On
05		M 715	29 Sep 96	945	N37:48.47	W129:02.27	3	74	12	On
05		M 761	2 Oct 96	936	N37:03.91	W124:52.40	2	149	11	On
05		M 763	2 Oct 96	1026	N37:05.12	W125:02.90	2	143	300	On
05		M 766	2 Oct 96	1137	N37:07.30	W125:17.03	2	148	25	On
05		M 772	2 Oct 96	1345	N37:10.03	W125:39.40	2	73	45	On
05		M 815	8 Oct 96	800	N35:31.70	W121:11.17	1	148	500	On
05		M 827	8 Oct 96	845	N35:28.13	W121:19.36	1	143	50	On
05		M 846	8 Oct 96	915	N35:25.84	W121:24.50	1	143	10	On
05		M 909	11 Oct 96	1733	N31:48.27	W123:21.35	5	74	240	On
05		M 925	13 Oct 96	1109	N33:37.27	W118:55.11	3	143	75	On
05	17 EJ	M 930	13 Oct 96	1355	N33:43.61	W118:40.39	2	74	36	On
05		M 960	14 Oct 96	1524	N32:44.94	W118:11.27	0	74	130	Off
05		M 961	14 Oct 96	1605	N32:45.64	W118:17.67	0	145	300	Off
Stenella coeruleoalba										
13	17	J 198	21 Sep 96	930	N39:05.54	W126:04.76	5	4	84	On
13	17	J 246	11 Oct 96	1649	N42:00.31	W129:16.49	5	92	348	On
13	17	J 265	17 Oct 96	749	N38:41.59	W129:45.09	1	71	25	Off
13	17	J 268	17 Oct 96	1241	N38:36.81	W128:52.96	5	91	143	On
13	17	J 352	28 Oct 96	812	N31:18.42	W120:52.69	2	91	291	On
13		J 363	28 Oct 96	1638	N30:46.74	W122:10.59	3	148	22	On
13		J 365	31 Oct 96	845	N30:51.86	W124:00.53	3	154	10	On
13		J 366	31 Oct 96	924	N30:49.85	W124:05.49	3	92	22	On
13	17	J 368	31 Oct 96	1631	N31:15.80	W124:10.34	3	154	512	On
13	17	M 701	28 Sep 96	913	N37:46.47	W125:39.80	2	148	597	On
13	17	M 702	28 Sep 96	1022	N37:47.09	W125:46.75	2	148	487	On
13	17	M 711	28 Sep 96	1639	N37:25.22	W126:30.33	3	73	775	On
13	17	M 905	10 Oct 96	1229	N32:25.11	W124:39.47	3	73	71	On
13	17	M 906	11 Oct 96	1304	N31:54.81	W124:13.27	4	73	152	On
Delphinus capensis										
16		J 89	9 Sep 96	1009	N34:15.00	W120:30.00	4	91	12	Off
16		J 91	9 Sep 96	1125	N34:20.62	W120:20.79	4	153	2150	On
16		J 92	9 Sep 96	1239	N34:25.01	W120:12.67	2	91	14	On
16		M 781	7 Oct 96	1027	N35:35.23	W121:09.60	2	73	100	On
16		M 808	7 Oct 96	1632	N35:39.69	W121:38.54	4	74	539	On
16	EJ	M 929	13 Oct 96	1324	N33:42.01	W118:44.20	2	74	13	On
Delphinus delphis										
17	05	J 2	4 Sep 96	1554	N32:49.92	W117:24.03	4	154	28	On
17	ZC	J 4	5 Sep 96	725	N33:15.23	W118:37.63	1	91	153	On

Table 7 (cont.).

Species name Code	Other Codes	Sighting Number	Date	Time	Latitude	Longitude	Bft.	Obs. no.	School size	Effort
17	05	J 11	5 Sep 96	1115	N33:20.56	W118:57.57	1	92	270	On
17	ZC	J 33	6 Sep 96	749	N33:23.89	W119:45.95	1	91	59	On
17		M 47	27 Jul 96	1835	N39:47.08	W127:51.80	3	92	146	On
17		M 49	31 Jul 96	1247	N37:29.92	W128:44.49	5	73	46	On
17		M 50	31 Jul 96	1545	N37:28.76	W128:25.57	4	92	52	On
17		J 55	7 Sep 96	1248	N33:42.71	W122:05.53	4	138	177	On
17		J 60	7 Sep 96	1639	N33:43.70	W122:13.98	4	92	6	On
17	CU PU	J 85	9 Sep 96	810	N34:12.28	W120:40.38	4	4	418	On
17	PU	J 94	9 Sep 96	1601	N34:30.06	W120:45.13	3	155	540	Off
17		J 95	9 Sep 96	1611	N34:29.94	W120:46.81	3	4	33	On
17		J 140	10 Sep 96	1818	N34:48.86	W123:11.30	4	91	5	On
17		J 141	10 Sep 96	1833	N34:49.17	W123:14.11	4	34	5	On
17		J 146	11 Sep 96	1042	N34:52.66	W123:40.20	4	92	183	On
17		J 147	11 Sep 96	1045	N34:52.79	W123:40.77	4	155	25	Off
17		J 150	11 Sep 96	1425	N34:55.98	W124:07.51	1	92	37	On
17		J 151	11 Sep 96	1643	N34:58.77	W124:31.14	4	138	18	On
17		J 153	14 Sep 96	1330	N36:14.61	W125:58.81	4	4	428	On
17		J 154	14 Sep 96	1408	N36:16.73	W125:51.14	3	91	20	On
17		J 155	14 Sep 96	1428	N36:18.58	W125:47.04	2	91	16	On
17		J 158	14 Sep 96	1831	N36:15.68	W125:34.73	2	4	18	On
17		J 159	14 Sep 96	1855	N36:18.57	W125:31.05	2	154	217	On
17		J 161	15 Sep 96	721	N36:22.12	W125:26.43	4	34	8	On
17		J 162	15 Sep 96	1044	N36:26.23	W125:16.95	4	4	85	Off
17		J 168	15 Sep 96	1310	N36:35.65	W124:58.94	3	4	121	On
17		J 193	19 Sep 96	947	N38:09.67	W125:27.60	6	91	70	On
17		J 194	19 Sep 96	1047	N38:11.50	W125:33.09	6	4	6	On
17		J 195	20 Sep 96	1245	N38:28.79	W127:31.49	5	138	268	On
17		J 196	20 Sep 96	1318	N38:29.20	W127:27.10	5	153	38	On
17		J 197	20 Sep 96	1816	N38:51.67	W126:38.24	5	4	85	On
17	13	J 198	21 Sep 96	930	N39:05.54	W126:04.76	5	4	84	On
17		J 200	23 Sep 96	819	N39:21.84	W125:27.29	5	4	118	On
17		M 216	7 Aug 96	1357	N36:12.26	W123:00.61	4	91	6	On
17		M 218	7 Aug 96	1511	N36:06.12	W123:14.07	4	92	11	On
17		M 221	7 Aug 96	1710	N35:57.88	W123:32.88	4	91	19	On
17		M 223	7 Aug 96	1730	N35:55.78	W123:35.95	4	15	30	On
17		M 230	8 Aug 96	904	N34:39.52	W123:09.04	5	91	17	On
17		M 232	8 Aug 96	1038	N34:31.81	W123:24.27	5	145	45	On
17		M 233	8 Aug 96	1154	N34:27.11	W123:36.46	5	73	16	On
17		M 234	8 Aug 96	1258	N34:23.20	W123:45.27	5	73	9	On
17		M 237	8 Aug 96	1846	N33:56.97	W124:42.19	5	74	32	On
17		M 242	10 Aug 96	729	N34:23.85	W127:15.05	4	73	51	On
17		M 243	10 Aug 96	754	N34:23.51	W127:09.82	4	73	42	On
17		M 244	11 Aug 96	1343	N33:52.52	W123:36.34	5	92	37	On
17		J 244	10 Oct 96	1049	N41:37.13	W129:26.67	4	4	233	On
17		M 245	11 Aug 96	1845	N33:46.78	W122:43.02	4	145	8	On
17	13	J 246	11 Oct 96	1649	N42:00.31	W129:16.49	5	92	348	On
17		M 248	12 Aug 96	1536	N32:38.78	W121:59.31	3	74	3	On
17		J 253	14 Oct 96	745	N40:30.60	W128:16.00	5	4	35	Off
17	77	J 260	16 Oct 96	1148	N39:12.52	W129:09.05	3	4	93	On
17		J 264	16 Oct 96	1829	N38:44.12	W130:04.05	1	92	6	On
17	13	J 265	17 Oct 96	749	N38:41.59	W129:45.09	1	71	25	Off
17		J 266	17 Oct 96	947	N38:38.79	W129:19.57	5	152	47	On
17		J 267	17 Oct 96	1006	N38:38.17	W129:15.26	5	91	161	On
17	13	J 268	17 Oct 96	1241	N38:36.81	W128:52.96	5	91	143	On

Table 7 (cont.).

Species name Code	Other Codes	Sighting Number	Date	Time	Latitude	Longitude	Bft.	Obs. no.	School size	Effort
17		J 269	18 Oct 96	1000	N39:32.30	W128:19.70	5	71	100	Off
17		J 270	19 Oct 96	840	N39:17.06	W126:28.48	5	92	140	Off
17		J 273	19 Oct 96	1513	N39:07.15	W125:29.39	5	154	18	Off
17		J 274	20 Oct 96	854	N39:03.84	W124:45.18	5	4	2	On
17		M 293	14 Aug 96	1422	N32:15.84	W118:44.23	2	92	79	On
17		M 295	14 Aug 96	1651	N32:12.16	W118:24.32	3	145	161	On
17		J 296	21 Oct 96	1131	N39:07.93	W125:13.07	2	153	8	On
17		M 297	14 Aug 96	1834	N32:12.94	W118:18.26	3	92	485	On
17		M 302	20 Aug 96	1226	N33:05.26	W117:25.51	3	73	142	On
17		J 306	22 Oct 96	822	N37:21.69	W126:49.08	3	138	270	Off
17		M 306	20 Aug 96	1646	N33:11.47	W118:15.19	4	73	195	On
17		M 308	20 Aug 96	1736	N33:14.65	W118:24.03	4	74	58	On
17		M 309	20 Aug 96	1834	N33:15.58	W118:33.76	5	74	10	On
17		M 310	20 Aug 96	1859	N33:17.17	W118:36.34	5	74	11	On
17	ZC	J 317	25 Oct 96	1652	N35:37.53	W121:43.35	5	92	332	On
17		J 322	26 Oct 96	1419	N34:46.02	W121:03.18	5	91	50	Off
17	ZC	J 325	27 Oct 96	631	N33:12.32	W119:52.02	4	152	216	On
17	13	J 352	28 Oct 96	812	N31:18.42	W120:52.69	2	91	291	On
17		J 354	28 Oct 96	932	N31:13.75	W121:05.65	2	138	20	On
17		J 355	28 Oct 96	952	N31:14.09	W121:08.91	2	152	13	On
17		J 357	28 Oct 96	1031	N31:10.47	W121:13.60	2	91	17	On
17		J 362	28 Oct 96	1439	N30:51.35	W121:51.08	2	152	33	On
17	13	J 368	31 Oct 96	1631	N31:15.80	W124:10.34	3	154	512	On
17		J 369	1 Nov 96	1137	N32:57.42	W124:14.73	4	92	18	On
17		J 377	4 Nov 96	944	N31:21.12	W119:52.92	3	152	270	On
17		M 687	27 Sep 96	1513	N38:06.36	W125:03.76	2	145	22	On
17		M 688	27 Sep 96	1556	N38:03.67	W125:09.85	2	145	23	On
17		M 690	27 Sep 96	1640	N37:59.59	W125:16.79	1	74	14	On
17		M 695	27 Sep 96	1834	N37:55.10	W125:21.21	1	73	24	On
17		M 696	28 Sep 96	727	N37:56.52	W125:25.65	3	74	73	On
17		M 697	28 Sep 96	729	N37:56.41	W125:25.88	3	143	84	On
17		M 698	28 Sep 96	800	N37:53.08	W125:30.78	3	143	800	On
17		M 699	28 Sep 96	901	N37:47.48	W125:37.63	2	148	10	On
17	13	M 701	28 Sep 96	913	N37:46.47	W125:39.80	2	148	597	On
17	13	M 702	28 Sep 96	1022	N37:47.09	W125:46.75	2	148	487	On
17		M 703	28 Sep 96	1022	N37:47.06	W125:46.85	2	74	308	On
17		M 704	28 Sep 96	1024	N37:46.99	W125:47.05	2	148	30	On
17		M 709	28 Sep 96	1432	N37:36.05	W126:10.14	2	148	73	On
17		M 710	28 Sep 96	1509	N37:34.09	W126:16.53	3	149	9	On
17	13	M 711	28 Sep 96	1639	N37:25.22	W126:30.33	3	73	775	On
17		M 712	28 Sep 96	1645	N37:24.55	W126:31.48	3	73	7	Off
17		M 713	28 Sep 96	1738	N37:22.62	W126:37.57	4	145	14	On
17		M 723	30 Sep 96	1618	N38:12.05	W125:45.88	2	73	10	On
17		M 724	30 Sep 96	1740	N38:09.82	W125:28.45	3	149	5	On
17		M 729	1 Oct 96	957	N38:07.32	W125:08.41	2	74	86	On
17		M 737	1 Oct 96	1328	N38:02.76	W124:29.69	1	74	125	On
17		M 738	1 Oct 96	1427	N37:58.02	W124:30.23	1	73	11	On
17		M 775	2 Oct 96	1815	N37:16.41	W126:33.72	4	143	20	On
17		M 779	3 Oct 96	1248	N36:06.47	W125:17.82	2	73	108	On
17		M 780	4 Oct 96	1539	N35:11.76	W125:12.34	5	74	575	On
17		M 802	7 Oct 96	1547	N35:36.86	W121:31.39	4	73	188	On
17		M 849	8 Oct 96	922	N35:25.34	W121:25.65	1	73	9	On
17		M 850	8 Oct 96	925	N35:25.13	W121:26.16	1	113	65	On
17		M 854	8 Oct 96	935	N35:24.42	W121:27.81	1	113	5	On

Table 7 (cont.).

Species name Code	Other Codes	Sighting Number	Date	Time	Latitude	Longitude	Bft.	Obs. no.	School size	Effort
17		M 902	9 Oct 96	1602	N33:11.15	W122:59.62	4	143	8	On
17	13	M 905	10 Oct 96	1229	N32:25.11	W124:39.47	3	73	71	On
17	13	M 906	11 Oct 96	1304	N31:54.81	W124:13.27	4	73	152	On
17		M 918	13 Oct 96	900	N33:29.15	W119:13.20	3	113	11	On
17		M 919	13 Oct 96	908	N33:30.36	W119:12.49	3	145	7	Off
17		M 921	13 Oct 96	1002	N33:34.18	W119:03.86	3	73	79	On
17		M 922	13 Oct 96	1011	N33:34.61	W119:02.15	3	73	18	On
17		M 923	13 Oct 96	1012	N33:34.69	W119:01.88	3	73	30	On
17	EJ 05	M 930	13 Oct 96	1355	N33:43.61	W118:40.39	2	74	36	On
17		M 932	13 Oct 96	1458	N33:46.68	W118:34.58	1	143	211	On
17		M 935	14 Oct 96	1055	N32:27.14	W118:16.03	2	73	70	On
Tursiops truncatus										
18	36	M 286	14 Aug 96	1119	N32:15.51	W118:57.25	2	74	16	On
18	21	M 694	27 Sep 96	1751	N37:56.76	W125:18.46	1	143	20	On
18	21	M 908	11 Oct 96	1425	N31:52.78	W123:58.34	4	145	9	On
18	21	M 924	13 Oct 96	1107	N33:37.20	W118:55.38	3	148	13	On
18		M 931	13 Oct 96	1433	N33:45.67	W118:37.69	2	113	4	On
Grampus griseus										
21		M 2	18 Jul 96	1024	N47:53.50	W125:21.68	5	144	5	On
21		M 3	18 Jul 96	1126	N47:48.94	W125:32.30	4	92	111	On
21	27 22	M 4	18 Jul 96	1142	N47:49.02	W125:36.30	4	74	50	Off
21		M 5	18 Jul 96	1223	N47:45.11	W125:42.73	3	92	81	On
21	27	M 7	18 Jul 96	1524	N47:31.22	W126:19.63	4	74	63	On
21		M 8	18 Jul 96	1612	N47:25.77	W126:25.51	4	92	12	On
21		J 10	5 Sep 96	1045	N33:20.00	W118:55.97	2	153	2	Off
21		J 12	5 Sep 96	1115	N33:20.56	W118:57.59	1	153	6	On
21		M 13	20 Jul 96	826	N46:20.84	W129:22.64	5	73	2	On
21		M 15	20 Jul 96	1433	N46:49.79	W128:08.73	4	145	4	Off
21		J 75	8 Sep 96	1847	N34:07.86	W120:51.65	4	138	4	On
21		J 76	9 Sep 96	645	N34:08.45	W120:49.74	3	154	2	Off
21		M 142	6 Aug 96	1607	N36:46.92	W122:33.69	2	143	10	On
21	27	M 156	6 Aug 96	1803	N36:43.72	W122:09.04	3	73	200	On
21		M 247	12 Aug 96	1321	N32:42.70	W122:25.96	2	143	22	On
21		J 311	24 Oct 96	1247	N35:57.63	W124:13.87	3	91	4	On
21		J 360	28 Oct 96	1320	N30:57.62	W121:38.63	2	153	5	On
21		M 459	2 Sep 96	1035	N46:36.58	W124:58.79	3	149	4	On
21		M 474	3 Sep 96	1122	N45:10.73	W124:47.87	3	73	1	Off
21		M 475	3 Sep 96	1242	N45:12.42	W124:57.37	3	74	3	On
21		M 488	3 Sep 96	1900	N45:22.91	W126:14.07	3	148	5	On
21		M 510	10 Sep 96	908	N43:46.25	W130:34.75	3	73	2	On
21	22	M 606	17 Sep 96	1400	N43:52.29	W124:42.90	1	145	60	On
21		M 610	17 Sep 96	1417	N43:54.54	W124:39.10	1	73	25	On
21	18	M 694	27 Sep 96	1751	N37:56.76	W125:18.46	1	143	20	On
21		M 714	29 Sep 96	839	N37:42.83	W129:15.13	3	148	8	On
21	18	M 908	11 Oct 96	1425	N31:52.78	W123:58.34	4	145	9	On
21		M 914	13 Oct 96	747	N33:23.38	W119:26.11	5	145	6	On
21		M 915	13 Oct 96	751	N33:23.75	W119:25.34	5	73	2	On
21		M 920	13 Oct 96	924	N33:32.14	W119:10.87	3	143	8	On
21	18	M 924	13 Oct 96	1107	N33:37.20	W118:55.38	3	148	13	On
21	77	M 926	13 Oct 96	1228	N33:38.02	W118:53.13	2	74	45	On

Table 7 (cont.).

Species name Code	Other Codes	Sighting Number	Date	Time	Latitude	Longitude	Bft.	Obs. no.	School size	Effort
Lagenorhynchus obliquidens										
22	27 21	M 4	18 Jul 96	1142	N47:49.02	W125:36.30	4	74	50	Off
22		J 14	5 Sep 96	1308	N33:18.22	W119:02.88	1	152	8	Off
22	ZC	J 15	5 Sep 96	1316	N33:18.43	W119:04.28	1	92	11	On
22		J 18	5 Sep 96	1348	N33:19.13	W119:09.01	1	138	7	On
22	ZC	J 20	5 Sep 96	1453	N33:19.31	W119:10.15	1	152	55	Off
22	ZC	J 22	5 Sep 96	1550	N33:19.37	W119:10.10	1	152	28	On
22		J 35	6 Sep 96	820	N33:25.33	W119:49.59	1	34	12	On
22	ZC	J 37	6 Sep 96	823	N33:25.40	W119:50.08	1	91	52	On
22	ZC	J 39	6 Sep 96	852	N33:26.08	W119:53.57	2	92	77	On
22	ZC	J 40	6 Sep 96	936	N33:24.88	W119:59.28	2	138	50	On
22	ZC	J 41	6 Sep 96	940	N33:25.03	W120:00.19	2	92	56	Off
22		M 42	27 Jul 96	822	N40:28.22	W126:13.22	4	91	16	On
22	ZC	J 43	6 Sep 96	958	N33:25.51	W120:03.47	2	152	15	On
22	ZC	J 48	6 Sep 96	1122	N33:23.94	W120:10.45	3	152	52	On
22	ZC	M 88	5 Aug 96	1242	N37:23.61	W123:26.83	6	92	3	Off
22		M 89	5 Aug 96	1251	N37:22.45	W123:26.29	6	143	7	Off
22		J 98	9 Sep 96	1722	N34:33.48	W120:57.90	4	4	5	Off
22	27 44 ZC	M 123	6 Aug 96	1429	N36:49.78	W122:54.31	2	145	2200	On
22	27	M 128	6 Aug 96	1501	N36:48.89	W122:47.70	2	91	350	On
22		M 137	6 Aug 96	1545	N36:47.51	W122:38.40	2	145	5	On
22	74	M 138	6 Aug 96	1546	N36:47.50	W122:38.27	2	92	11	On
22	27	M 139	6 Aug 96	1602	N36:47.07	W122:34.87	2	145	175	On
22		M 149	6 Aug 96	1654	N36:45.50	W122:23.88	3	92	108	On
22	27	J 203	23 Sep 96	1401	N39:44.80	W124:33.26	2	91	16	On
22		J 284	20 Oct 96	1218	N38:58.53	W124:03.73	6	138	7	Off
22	27	J 288	20 Oct 96	1525	N38:43.48	W123:47.11	6	91	16	Off
22		M 328	26 Aug 96	821	N42:12.60	W125:40.82	2	145	17	On
22	27 44	M 329	26 Aug 96	1044	N42:16.00	W126:11.35	4	74	69	On
22		M 351	27 Aug 96	1623	N41:36.73	W126:46.76	2	148	98	On
22	27	M 403	28 Aug 96	1519	N41:09.97	W125:35.62	1	145	450	On
22	27	M 427	28 Aug 96	1747	N41:06.99	W125:11.46	2	149	41	On
22		M 492	7 Sep 96	1012	N47:15.13	W125:02.20	3	149	37	On
22		M 493	7 Sep 96	1051	N47:13.57	W125:07.57	3	143	4	On
22	27	M 495	7 Sep 96	1137	N47:13.27	W125:15.96	3	149	262	On
22		M 497	7 Sep 96	1236	N47:16.16	W125:20.18	3	145	350	Off
22	21	M 606	17 Sep 96	1400	N43:52.29	W124:42.90	1	145	60	On
22		M 654	26 Sep 96	1449	N40:56.90	W124:49.45	4	73	12	On
22	27	M 739	1 Oct 96	1521	N37:59.16	W124:18.75	2	145	37	On
22	27	M 746	1 Oct 96	1724	N37:58.31	W123:56.32	1	74	767	On
22		M 803	7 Oct 96	1556	N35:38.14	W121:32.04	4	73	29	Off
22	ZC	M 810	7 Oct 96	1727	N35:38.58	W121:40.86	4	74	68	On
Lissodelphis borealis										
27	21 22	M 4	18 Jul 96	1142	N47:49.02	W125:36.30	4	74	50	Off
27	21	M 7	18 Jul 96	1524	N47:31.22	W126:19.63	4	74	63	On
27		M 87	5 Aug 96	1134	N37:31.07	W123:17.84	5	74	3	On
27	22 44 ZC	M 123	6 Aug 96	1429	N36:49.78	W122:54.31	2	145	2200	On
27	22	M 128	6 Aug 96	1501	N36:48.89	W122:47.70	2	91	350	On
27	22	M 139	6 Aug 96	1602	N36:47.07	W122:34.87	2	145	175	On
27	21	M 156	6 Aug 96	1803	N36:43.72	W122:09.04	3	73	200	On
27	22	J 203	23 Sep 96	1401	N39:44.80	W124:33.26	2	91	16	On
27		J 227	1 Oct 96	1822	N43:59.23	W128:01.93	2	92	2	On
27		J 241	9 Oct 96	1246	N42:41.73	W125:33.53	2	91	20	Off

Table 7 (cont.).

Species name Code	Other Codes	Sighting Number	Date	Time	Latitude	Longitude	Bft.	Obs. no.	School size	Effort
27		J 282	20 Oct 96	1146	N38:59.29	W124:09.91	6	4	2	Off
27	22	J 288	20 Oct 96	1525	N38:43.48	W123:47.11	6	91	16	Off
27	74 70	J 316	25 Oct 96	1521	N35:39.19	W121:54.73	3	154	6	On
27	22 44	M 329	26 Aug 96	1044	N42:16.00	W126:11.35	4	74	69	On
27		J 347	27 Oct 96	1119	N32:51.80	W120:39.85	3	71	35	On
27	22	M 403	28 Aug 96	1519	N41:09.97	W125:35.62	1	145	450	On
27	22	M 427	28 Aug 96	1747	N41:06.99	W125:11.46	2	149	41	On
27	22	M 495	7 Sep 96	1137	N47:13.27	W125:15.96	3	149	262	On
27		M 499	7 Sep 96	1637	N47:21.19	W126:16.09	4	148	5	On
27	77	M 645	23 Sep 96	1859	N46:15.39	W125:21.75	5	74	17	On
27	22	M 739	1 Oct 96	1521	N37:59.16	W124:18.75	2	145	37	On
27	22	M 746	1 Oct 96	1724	N37:58.31	W123:56.32	1	74	767	On
Globicephala macrorhynchus										
36	18	M 286	14 Aug 96	1119	N32:15.51	W118:57.25	2	74	16	On
36		M 647	24 Sep 96	859	N44:49.86	W125:56.55	4	74	4	On
Orcinus orca										
37		M 146	6 Aug 96	1642	N36:45.87	W122:26.20	3	73	9	On
37		J 220	24 Sep 96	1850	N40:21.61	W126:53.41	5	138	2	Off
37		J 259	15 Oct 96	1527	N40:12.50	W130:05.91	3	92	7	On
37		J 291	20 Oct 96	1707	N38:33.03	W123:31.39	6	152	5	Off
37		M 335	26 Aug 96	1734	N42:25.40	W127:31.31	3	74	3	On
37		M 438	30 Aug 96	834	N43:11.23	W125:20.29	4	149	5	On
37		M 515	10 Sep 96	1637	N43:37.17	W129:05.13	2	143	1	On
37	44	M 526	12 Sep 96	1529	N43:28.09	W124:29.74	3	143	3	Off
37		M 901	9 Oct 96	1340	N33:18.75	W122:41.25	4	143	2	On
Phocoena phocoena										
40		M 176	7 Aug 96	647	N36:39.72	W121:59.22	0	15	1	On
40		M 188	7 Aug 96	821	N36:36.30	W122:06.71	1	92	1	On
40		M 190	7 Aug 96	824	N36:36.12	W122:07.14	1	92	1	On
40		M 453	2 Sep 96	720	N46:51.96	W124:18.10	3	143	1	On
40		M 454	2 Sep 96	751	N46:49.64	W124:24.99	4	73	1	On
40		M 455	2 Sep 96	803	N46:48.65	W124:27.39	4	73	2	On
40		M 522	12 Sep 96	1321	N43:21.91	W124:24.40	3	145	1	Off
40		M 523	12 Sep 96	1326	N43:21.44	W124:24.86	3	145	4	Off
40		M 530	13 Sep 96	843	N43:59.72	W124:51.23	4	73	1	Off
40		M 531	13 Sep 96	847	N44:00.38	W124:51.05	4	73	2	Off
40		M 532	13 Sep 96	849	N44:00.77	W124:50.94	4	73	1	Off
40		M 533	13 Sep 96	851	N44:01.08	W124:50.85	4	73	1	Off
40		M 534	13 Sep 96	852	N44:01.29	W124:50.80	4	73	2	Off
40		M 535	13 Sep 96	854	N44:01.63	W124:50.72	4	145	2	Off
40		M 536	13 Sep 96	854	N44:01.74	W124:50.68	4	73	2	Off
40		M 553	16 Sep 96	1848	N44:07.67	W124:15.41	3	86	4	On
40		M 554	16 Sep 96	1905	N44:07.27	W124:11.56	3	74	1	On
40		M 555	16 Sep 96	1907	N44:07.22	W124:11.08	3	148	1	On
40		M 635	17 Sep 96	1644	N44:07.15	W124:10.04	3	73	2	Off
40		M 636	17 Sep 96	1647	N44:07.22	W124:10.74	3	73	1	Off
Phocoenoides dalli										
44		M 1	18 Jul 96	906	N47:59.76	W125:03.76	4	92	3	Off
44		M 9	18 Jul 96	1723	N47:21.69	W126:39.86	4	144	4	On
44		M 19	21 Jul 96	1056	N45:43.88	W130:02.35	3	92	3	On

Table 7 (cont.).

Species name Code	Other Codes	Sighting Number	Date	Time	Latitude	Longitude	Bft.	Obs. no.	School size	Effort
44		M 20	21 Jul 96	1103	N45:43.77	W130:00.59	3	147	2	On
44		M 27	25 Jul 96	1725	N43:30.77	W125:22.25	5	147	1	Off
44		M 34	26 Jul 96	1003	N41:09.94	W125:23.13	5	73	1	Off
44		M 35	26 Jul 96	1012	N41:11.31	W125:22.55	5	98	3	Off
44		M 36	26 Jul 96	1018	N41:12.32	W125:22.15	5	98	2	Off
44		M 55	3 Aug 96	804	N39:17.17	W125:33.82	5	73	7	On
44		M 56	3 Aug 96	812	N39:18.03	W125:32.49	5	73	6	On
44		M 57	3 Aug 96	814	N39:18.19	W125:32.15	5	73	4	On
44		M 58	3 Aug 96	1126	N39:38.26	W125:00.97	5	74	5	Off
44		M 59	3 Aug 96	1357	N39:50.25	W124:39.85	7	144	1	Off
44		M 60	3 Aug 96	1413	N39:47.97	W124:38.06	7	143	3	Off
44		M 96	6 Aug 96	756	N36:59.91	W124:10.08	4	15	1	On
44		M 114	6 Aug 96	1343	N36:51.43	W123:03.87	3	144	2	On
44	22 27 ZC	M 123	6 Aug 96	1429	N36:49.78	W122:54.31	2	145	2200	On
44		M 169	6 Aug 96	1846	N36:42.16	W121:59.77	3	145	4	On
44		M 178	7 Aug 96	655	N36:39.00	W122:00.80	0	92	2	On
44		J 181	17 Sep 96	913	N37:50.24	W123:07.99	5	4	2	Off
44		J 190	18 Sep 96	812	N37:53.02	W123:19.02	5	4	5	On
44		J 192	18 Sep 96	924	N37:54.49	W123:32.64	5	4	3	On
44		M 193	7 Aug 96	830	N36:35.65	W122:08.23	1	73	3	On
44		M 194	7 Aug 96	831	N36:35.57	W122:08.41	1	92	2	On
44		M 195	7 Aug 96	833	N36:35.36	W122:08.91	1	73	2	On
44		M 196	7 Aug 96	835	N36:35.24	W122:09.20	1	73	2	On
44		M 198	7 Aug 96	837	N36:35.09	W122:09.58	1	73	5	On
44		M 199	7 Aug 96	839	N36:34.94	W122:09.93	1	92	1	On
44		J 204	23 Sep 96	1741	N40:02.25	W124:42.91	1	34	5	Off
44		J 207	23 Sep 96	1846	N40:06.14	W124:56.68	3	4	3	On
44		M 210	7 Aug 96	1053	N36:27.16	W122:27.50	1	144	3	On
44		J 211	24 Sep 96	752	N40:08.00	W125:12.86	3	152	8	On
44		J 228	2 Oct 96	742	N44:58.13	W125:36.15	4	91	2	On
44		J 229	2 Oct 96	745	N44:58.37	W125:35.50	4	34	3	On
44		J 230	2 Oct 96	840	N45:02.38	W125:24.87	4	91	3	On
44		J 233	2 Oct 96	1429	N45:27.49	W124:20.60	6	153	2	On
44		J 235	2 Oct 96	1450	N45:29.25	W124:17.37	6	153	3	On
44		J 236	2 Oct 96	1503	N45:30.78	W124:15.97	5	91	3	On
44		J 239	9 Oct 96	1210	N42:45.36	W125:28.34	2	4	1	Off
44		J 250	13 Oct 96	856	N41:17.32	W127:20.22	5	92	5	Off
44		J 251	13 Oct 96	924	N41:16.47	W127:23.04	5	4	3	On
44		J 286	20 Oct 96	1425	N38:49.42	W123:53.97	6	91	5	Off
44		J 289	20 Oct 96	1527	N38:43.22	W123:46.78	6	71	2	Off
44		J 293	21 Oct 96	1003	N39:04.19	W124:55.28	2	138	2	Off
44		M 311	25 Aug 96	715	N42:15.28	W128:40.59	5	149	3	On
44		M 318	26 Aug 96	709	N42:10.39	W125:25.09	1	73	5	On
44		M 326	26 Aug 96	722	N42:10.88	W125:28.21	2	73	1	On
44		J 326	27 Oct 96	701	N33:10.22	W119:56.69	4	71	4	On
44	22 27	M 329	26 Aug 96	1044	N42:16.00	W126:11.35	4	74	69	On
44		M 331	26 Aug 96	1236	N42:16.56	W126:26.89	3	148	3	On
44		M 332	26 Aug 96	1244	N42:16.83	W126:28.61	3	150	6	Off
44		M 333	26 Aug 96	1322	N42:17.96	W126:35.91	4	145	5	On
44		M 334	26 Aug 96	1517	N42:21.32	W127:01.14	4	143	2	On
44		M 342	27 Aug 96	1410	N41:47.11	W126:20.74	3	74	2	On
44		M 343	27 Aug 96	1427	N41:45.72	W126:24.01	3	149	1	On
44		M 344	27 Aug 96	1452	N41:43.87	W126:28.69	1	73	3	On
44		M 348	27 Aug 96	1545	N41:39.68	W126:39.23	3	148	3	On

Table 7 (cont.).

Species name Code	Other Codes	Sighting Number	Date	Time	Latitude	Longitude	Bft.	Obs. no.	School size	Effort
44		M 349	27 Aug 96	1553	N41:39.01	W126:40.94	3	73	1	On
44		M 350	27 Aug 96	1555	N41:38.93	W126:41.16	3	145	4	On
44		M 353	27 Aug 96	1725	N41:31.57	W126:58.40	3	145	2	On
44		M 355	27 Aug 96	1817	N41:25.79	W127:07.83	4	86	4	On
44		M 356	27 Aug 96	1824	N41:25.05	W127:09.02	4	143	5	On
44		M 357	27 Aug 96	1841	N41:24.55	W127:10.15	4	73	1	On
44		M 358	27 Aug 96	1857	N41:23.24	W127:13.47	4	73	2	On
44		M 359	27 Aug 96	1904	N41:22.73	W127:14.89	3	143	3	On
44		M 361	28 Aug 96	739	N41:20.77	W127:08.24	4	148	8	On
44		M 362	28 Aug 96	759	N41:20.27	W127:03.67	4	145	4	On
44		M 364	28 Aug 96	1015	N41:16.80	W126:34.97	4	149	1	On
44		M 365	28 Aug 96	1029	N41:16.45	W126:31.77	3	73	3	On
44		M 366	28 Aug 96	1126	N41:15.01	W126:19.60	3	145	2	On
44		M 367	28 Aug 96	1234	N41:14.08	W126:11.82	3	145	4	On
44		M 368	28 Aug 96	1257	N41:13.59	W126:07.26	3	74	8	On
44		M 370	28 Aug 96	1308	N41:13.39	W126:04.82	3	143	3	On
44		M 373	28 Aug 96	1311	N41:13.33	W126:04.11	3	143	4	On
44		M 375	28 Aug 96	1315	N41:13.27	W126:03.31	3	143	1	On
44		M 378	28 Aug 96	1328	N41:13.00	W126:00.46	3	143	2	On
44		M 379	28 Aug 96	1340	N41:12.76	W125:57.76	2	143	2	On
44		M 380	28 Aug 96	1350	N41:12.48	W125:55.63	2	73	3	On
44		M 381	28 Aug 96	1354	N41:12.36	W125:54.81	2	73	2	On
44		M 383	28 Aug 96	1401	N41:12.13	W125:53.26	2	149	3	On
44		M 385	28 Aug 96	1404	N41:12.04	W125:52.60	2	73	2	On
44		M 386	28 Aug 96	1408	N41:11.91	W125:51.69	2	73	2	On
44		M 387	28 Aug 96	1411	N41:11.82	W125:51.04	2	149	1	On
44		M 389	28 Aug 96	1415	N41:11.67	W125:50.05	2	73	1	On
44		M 392	28 Aug 96	1430	N41:11.21	W125:46.75	1	143	6	On
44		M 393	28 Aug 96	1431	N41:11.19	W125:46.53	1	143	3	On
44		M 394	28 Aug 96	1437	N41:11.01	W125:45.16	1	143	1	On
44		M 395	28 Aug 96	1439	N41:10.93	W125:44.50	1	143	2	On
44		M 396	28 Aug 96	1448	N41:10.69	W125:42.68	0	148	2	On
44		M 399	28 Aug 96	1504	N41:10.32	W125:38.94	1	151	2	On
44		M 400	28 Aug 96	1506	N41:10.26	W125:38.41	1	73	2	On
44		M 401	28 Aug 96	1511	N41:10.15	W125:37.38	1	145	4	On
44		M 402	28 Aug 96	1518	N41:09.98	W125:35.82	1	148	2	On
44		M 404	28 Aug 96	1628	N41:09.81	W125:29.21	1	145	2	On
44		M 405	28 Aug 96	1630	N41:09.69	W125:28.65	1	149	4	On
44		M 406	28 Aug 96	1631	N41:09.67	W125:28.50	1	145	7	On
44		M 407	28 Aug 96	1637	N41:09.43	W125:26.90	1	145	2	On
44		M 408	28 Aug 96	1640	N41:09.34	W125:26.28	1	149	3	On
44		M 408	28 Aug 96	1639	N41:09.38	W125:26.56	1	86	4	On
44		M 409	28 Aug 96	1643	N41:09.23	W125:25.52	1	150	4	On
44		M 410	28 Aug 96	1644	N41:09.19	W125:25.23	1	145	2	On
44		M 411	28 Aug 96	1647	N41:09.09	W125:24.52	1	149	1	On
44		M 412	28 Aug 96	1648	N41:09.08	W125:24.41	1	149	3	On
44		M 413	28 Aug 96	1649	N41:09.03	W125:24.05	1	145	2	On
44		M 414	28 Aug 96	1657	N41:08.75	W125:22.20	1	145	4	On
44		M 415	28 Aug 96	1702	N41:08.59	W125:21.20	1	143	1	On
44		M 417	28 Aug 96	1703	N41:08.54	W125:20.90	1	74	12	On
44		M 418	28 Aug 96	1709	N41:08.32	W125:19.66	1	74	12	On
44		M 419	28 Aug 96	1710	N41:08.25	W125:19.26	1	143	1	On
44		M 420	28 Aug 96	1711	N41:08.21	W125:19.02	1	143	4	On
44		M 422	28 Aug 96	1728	N41:07.57	W125:15.53	2	143	1	On

Table 7 (cont.).

Species name Code	Other Codes	Sighting Number	Date	Time	Latitude	Longitude	Bft.	Obs. no.	School size	Effort
44		M 423	28 Aug 96	1734	N41:07.36	W125:14.21	2	143	3	On
44		M 424	28 Aug 96	1737	N41:07.30	W125:13.71	2	143	2	On
44		M 425	28 Aug 96	1738	N41:07.28	W125:13.56	2	143	3	On
44		M 426	28 Aug 96	1744	N41:07.09	W125:12.11	2	150	5	On
44		M 429	28 Aug 96	1804	N41:05.16	W125:10.14	2	149	2	On
44		M 430	28 Aug 96	1839	N41:04.93	W125:02.28	1	143	1	On
44		M 431	28 Aug 96	1845	N41:04.90	W125:00.95	1	143	2	On
44		M 432	28 Aug 96	1855	N41:04.82	W124:58.53	2	73	5	On
44		M 433	28 Aug 96	1858	N41:04.81	W124:57.80	2	148	3	On
44		M 434	28 Aug 96	1902	N41:04.78	W124:56.90	2	143	5	On
44		M 436	28 Aug 96	1915	N41:04.69	W124:53.87	2	145	1	On
44		M 437	28 Aug 96	1918	N41:04.66	W124:53.09	2	73	1	On
44		M 442	31 Aug 96	840	N44:20.41	W126:35.59	4	73	1	On
44		M 443	31 Aug 96	931	N44:17.08	W126:24.27	4	145	4	On
44		M 444	31 Aug 96	1032	N44:17.85	W126:10.25	4	149	4	On
44		M 445	31 Aug 96	1229	N44:17.93	W125:49.28	4	73	3	Off
44		M 447	31 Aug 96	1350	N44:15.76	W125:31.00	4	148	1	On
44		M 448	31 Aug 96	1427	N44:14.85	W125:22.26	5	145	3	On
44		M 449	31 Aug 96	1450	N44:14.82	W125:16.51	5	145	1	On
44		M 464	3 Sep 96	718	N45:07.54	W124:08.90	2	73	3	On
44		M 466	3 Sep 96	727	N45:07.66	W124:11.11	2	73	3	On
44		M 468	3 Sep 96	753	N45:07.79	W124:15.96	2	148	3	On
44		M 470	3 Sep 96	807	N45:08.24	W124:19.06	2	150	3	On
44		M 480	3 Sep 96	1326	N45:14.90	W125:06.46	2	143	8	On
44		M 481	3 Sep 96	1345	N45:14.35	W125:08.89	3	150	3	On
44		M 482	3 Sep 96	1352	N45:14.47	W125:10.43	3	149	3	On
44		M 485	3 Sep 96	1757	N45:19.27	W126:00.44	3	149	2	On
44		M 486	3 Sep 96	1811	N45:19.72	W126:03.71	3	86	1	On
44		M 487	3 Sep 96	1856	N45:22.60	W126:13.28	3	143	2	On
44		M 489	3 Sep 96	1907	N45:22.72	W126:15.93	3	74	7	Off
44		M 490	4 Sep 96	709	N44:25.63	W127:02.32	2	74	6	On
44		M 498	7 Sep 96	1255	N47:16.65	W125:22.02	3	73	3	On
44		M 518	12 Sep 96	753	N43:09.64	W125:07.37	3	143	4	On
44	37	M 526	12 Sep 96	1529	N43:28.09	W124:29.74	3	143	3	Off
44		M 527	12 Sep 96	1842	N43:40.03	W124:35.11	4	74	5	Off
44		M 529	13 Sep 96	837	N43:58.71	W124:51.43	4	145	2	Off
44		M 537	13 Sep 96	1354	N44:08.95	W124:26.91	5	74	4	Off
44		M 538	14 Sep 96	837	N45:22.87	W126:34.39	4	145	2	On
44		M 539	14 Sep 96	847	N45:23.28	W126:36.69	4	74	4	On
44		M 556	17 Sep 96	718	N43:23.61	W125:56.19	3	149	1	On
44		M 558	17 Sep 96	751	N43:26.32	W125:49.26	3	74	3	On
44		M 559	17 Sep 96	805	N43:27.44	W125:46.48	3	149	4	On
44		M 561	17 Sep 96	903	N43:32.06	W125:34.90	2	143	3	On
44		M 562	17 Sep 96	907	N43:32.16	W125:34.68	2	148	5	On
44		M 565	17 Sep 96	944	N43:34.39	W125:25.80	1	145	3	On
44		M 566	17 Sep 96	1010	N43:37.26	W125:21.07	1	145	2	On
44		M 567	17 Sep 96	1029	N43:39.14	W125:17.11	1	74	3	On
44		M 568	17 Sep 96	1035	N43:39.61	W125:16.03	1	74	4	On
44		M 569	17 Sep 96	1042	N43:40.35	W125:14.40	1	148	1	On
44		M 570	17 Sep 96	1046	N43:40.72	W125:13.60	1	74	3	On
44		M 571	17 Sep 96	1101	N43:42.04	W125:10.47	1	149	1	On
44		M 575	17 Sep 96	1135	N43:44.34	W125:03.56	1	149	1	On
44		M 579	17 Sep 96	1155	N43:45.14	W124:59.24	1	143	2	On
44		M 580	17 Sep 96	1234	N43:46.37	W124:59.09	1	73	5	On

Table 7 (cont.).

Species name Code	Other Codes	Sighting Number	Date	Time	Latitude	Longitude	Bft.	Obs. no.	School size	Effort
44		M 581	17 Sep 96	1235	N43:46.43	W124:58.88	1	149	2	On
44		M 583	17 Sep 96	1307	N43:48.97	W124:52.18	1	148	6	On
44		M 586	17 Sep 96	1310	N43:49.18	W124:51.60	1	143	3	On
44		M 587	17 Sep 96	1313	N43:49.38	W124:51.01	1	143	3	On
44		M 588	17 Sep 96	1315	N43:49.51	W124:50.63	1	143	6	On
44		M 590	17 Sep 96	1323	N43:50.14	W124:48.82	1	143	1	On
44		M 592	17 Sep 96	1333	N43:50.88	W124:46.71	1	143	2	On
44		M 593	17 Sep 96	1335	N43:51.03	W124:46.29	1	148	5	On
44		M 594	17 Sep 96	1338	N43:51.24	W124:45.71	1	143	2	On
44		M 597	17 Sep 96	1344	N43:51.72	W124:44.35	1	143	7	On
44		M 598	17 Sep 96	1346	N43:51.84	W124:43.97	1	73	15	On
44		M 599	17 Sep 96	1347	N43:51.89	W124:43.83	1	73	2	On
44		M 601	17 Sep 96	1352	N43:52.29	W124:42.90	1	73	6	On
44		M 603	17 Sep 96	1355	N43:52.29	W124:42.90	1	73	5	On
44		M 604	17 Sep 96	1358	N43:52.29	W124:42.90	1	73	2	On
44		M 605	17 Sep 96	1359	N43:52.29	W124:42.90	1	145	1	On
44		M 607	17 Sep 96	1405	N43:53.74	W124:40.19	1	73	4	On
44		M 608	17 Sep 96	1412	N43:54.54	W124:39.10	1	73	5	On
44		M 611	17 Sep 96	1418	N43:54.54	W124:39.10	1	145	1	On
44		M 613	17 Sep 96	1428	N43:56.24	W124:36.01	1	148	2	On
44		M 614	17 Sep 96	1432	N43:56.56	W124:35.12	1	74	3	On
44		M 615	17 Sep 96	1432	N43:56.56	W124:35.12	1	145	7	On
44		M 616	17 Sep 96	1435	N43:56.78	W124:34.52	1	148	2	On
44		M 619	17 Sep 96	1448	N43:57.86	W124:31.70	1	74	4	On
44		M 620	17 Sep 96	1450	N43:57.99	W124:31.35	1	74	4	On
44		M 621	17 Sep 96	1454	N43:58.33	W124:30.34	1	145	2	On
44		M 622	17 Sep 96	1500	N43:58.76	W124:29.07	1	145	1	On
44		M 623	17 Sep 96	1503	N43:58.95	W124:28.52	1	145	1	On
44		M 625	17 Sep 96	1509	N43:59.49	W124:27.07	1	74	9	On
44		M 626	17 Sep 96	1511	N43:59.59	W124:26.81	1	145	2	On
44		M 627	17 Sep 96	1514	N43:59.88	W124:26.08	1	145	3	On
44		M 629	17 Sep 96	1517	N44:00.09	W124:25.58	1	145	2	On
44		M 630	17 Sep 96	1518	N44:00.21	W124:25.30	1	151	5	On
44		M 631	17 Sep 96	1522	N44:00.62	W124:24.37	1	145	2	On
44		M 632	17 Sep 96	1524	N44:00.76	W124:24.07	1	149	5	On
44		M 639	23 Sep 96	1517	N46:09.87	W124:27.46	5	143	2	On
44		M 646	24 Sep 96	853	N44:50.43	W125:55.16	4	74	8	On
44		M 648	24 Sep 96	1020	N44:46.48	W125:57.37	4	143	5	On
44		M 649	24 Sep 96	1138	N44:42.18	W126:15.38	5	143	2	On
44		M 650	24 Sep 96	1232	N44:39.35	W126:22.99	4	148	4	On
44		M 651	24 Sep 96	1341	N44:33.77	W126:36.46	5	145	7	On
44		M 652	26 Sep 96	1348	N41:03.98	W124:40.95	4	143	2	On
44		M 655	26 Sep 96	1517	N40:56.45	W124:55.35	4	73	15	On
44		M 658	26 Sep 96	1715	N40:51.18	W125:19.42	2	74	4	On
44		M 659	26 Sep 96	1837	N40:39.99	W125:15.21	2	143	2	Off
44		M 660	26 Sep 96	1851	N40:37.59	W125:13.51	2	145	2	Off
44		M 661	26 Sep 96	1859	N40:36.19	W125:12.53	2	145	1	Off
44		M 669	27 Sep 96	1047	N38:26.37	W124:17.23	1	148	6	On
44		M 670	27 Sep 96	1051	N38:26.00	W124:18.09	1	74	3	On
44		M 673	27 Sep 96	1124	N38:23.44	W124:24.10	1	74	4	On
44		M 683	27 Sep 96	1416	N38:10.72	W124:52.94	2	145	4	On
44		M 685	27 Sep 96	1435	N38:09.18	W124:56.41	2	148	2	On
44		M 686	27 Sep 96	1511	N38:06.54	W125:03.24	2	74	4	On
44		M 736	1 Oct 96	1257	N38:03.55	W124:36.02	1	145	4	On

Table 7 (cont.).

Species name Code	Other Codes	Sighting Number	Date	Time	Latitude	Longitude	Bft.	Obs. no.	School size	Effort
44		M 741	1 Oct 96	1629	N38:00.07	W124:08.01	2	148	2	On
44		M 743	1 Oct 96	1703	N37:58.98	W124:00.81	1	149	5	On
44		M 744	1 Oct 96	1705	N37:58.89	W124:00.31	1	145	3	On
44		M 748	1 Oct 96	1730	N37:57.86	W123:55.30	1	74	5	Off
44		M 819	8 Oct 96	819	N35:30.25	W121:14.52	1	113	2	On
44		M 822	8 Oct 96	831	N35:29.27	W121:16.76	1	145	6	On
44		M 828	8 Oct 96	847	N35:28.01	W121:19.64	1	74	5	On
44		M 881	8 Oct 96	1100	N35:17.82	W121:42.94	2	145	4	On
Physeter macrocephalus										
46		M 21	21 Jul 96	1148	N45:42.98	W129:49.01	3	73	5	On
46		J 61	7 Sep 96	1700	N33:43.61	W122:11.84	4	4	12	On
46		J 156	14 Sep 96	1445	N36:19.91	W125:43.82	2	4	1	On
46		J 160	15 Sep 96	718	N36:21.57	W125:26.81	4	92	4	On
46		J 165	15 Sep 96	1230	N36:32.11	W125:06.16	3	152	4	On
46		J 226	1 Oct 96	754	N43:21.70	W129:34.22	3	34	1	On
46		J 249	13 Oct 96	758	N41:22.00	W127:20.06	5	4	1	On
46		J 255	14 Oct 96	914	N40:26.54	W128:10.32	3	91	14	Off
46		J 272	19 Oct 96	957	N39:11.10	W126:18.71	5	153	1	Off
46		J 276	20 Oct 96	943	N39:02.63	W124:34.86	5	152	4	On
46		J 278	20 Oct 96	956	N39:02.30	W124:32.27	5	154	3	On
46		J 279	20 Oct 96	1032	N39:01.27	W124:24.74	5	91	1	On
46		J 280	20 Oct 96	1104	N39:00.40	W124:18.22	6	92	1	Off
46		J 281	20 Oct 96	1116	N39:00.09	W124:15.78	6	92	2	Off
46		J 283	20 Oct 96	1206	N38:58.79	W124:05.99	6	91	1	Off
46		J 292	21 Oct 96	912	N39:00.67	W124:46.23	2	152	4	Off
46		J 356	28 Oct 96	1019	N31:11.46	W121:11.55	2	152	2	On
46		J 364	30 Oct 96	953	N30:39.10	W122:05.82	4	138	1	On
46		J 379	4 Nov 96	1543	N31:14.68	W119:00.09	4	138	2	On
46		M 440	30 Aug 96	1834	N43:23.75	W127:21.05	4	148	1	Off
46		M 501	8 Sep 96	804	N45:51.63	W126:56.00	4	145	8	On
46		M 504	9 Sep 96	748	N45:15.51	W128:28.88	3	74	2	On
46		M 505	9 Sep 96	757	N45:14.77	W128:30.84	3	74	2	On
46		M 506	9 Sep 96	759	N45:14.59	W128:31.35	3	74	1	On
46		M 546	16 Sep 96	1145	N44:17.47	W125:09.62	5	145	1	On
46		M 547	16 Sep 96	1229	N44:16.32	W125:09.26	5	150	2	Off
46		M 548	16 Sep 96	1338	N44:15.89	W125:05.21	4	73	2	On
46		M 549	16 Sep 96	1418	N44:16.30	W125:03.56	4	73	1	Off
46		M 784	7 Oct 96	1157	N35:34.18	W121:16.15	3	145	1	On
Mesoplodon spp.										
51		M 17	21 Jul 96	708	N45:57.71	W130:21.49	3	143	2	Off
51		M 231	8 Aug 96	1012	N34:33.95	W123:21.35	5	92	3	On
51		M 241	9 Aug 96	1345	N33:27.21	W125:53.75	5	92	1	On
51		J 245	10 Oct 96	1606	N41:43.68	W130:22.09	4	92	1	On
51		M 360	27 Aug 96	1934	N41:20.67	W127:21.10	4	143	1	On
51		M 508	9 Sep 96	1927	N44:19.92	W130:50.28	1	73	1	On
51		M 509	9 Sep 96	1949	N44:18.23	W130:54.67	1	145	1	On
51		M 512	10 Sep 96	1103	N43:48.28	W130:11.57	3	73	2	Off
51		M 707	28 Sep 96	1204	N37:43.67	W125:54.06	2	143	3	Off
51		M 758	2 Oct 96	858	N37:02.86	W124:44.26	3	74	1	On
51		M 777	3 Oct 96	1113	N36:08.17	W125:28.86	1	148	1	On
51		M 904	10 Oct 96	1223	N32:25.57	W124:38.40	3	113	2	On

Table 7 (cont.).

Species name Code	Other Codes	Sighting Number	Date	Time	Latitude	Longitude	Bft.	Obs. no.	School size	Effort
Ziphius cavirostris										
61		M 10	19 Jul 96	843	N46:58.04	W127:46.27	4	144	2	Off
61		M 16	20 Jul 96	1650	N47:01.34	W127:38.21	4	91	1	On
61		M 23	21 Jul 96	1756	N45:46.14	W129:35.58	4	74	2	On
61		J 129	10 Sep 96	1314	N34:41.84	W122:14.08	3	4	2	On
61		J 149	11 Sep 96	1256	N34:54.50	W123:56.57	2	91	1	On
61		J 308	22 Oct 96	1250	N37:01.58	W127:29.72	3	153	1	On
61		M 705	28 Sep 96	1149	N37:44.15	W125:53.51	2	143	2	On
Berardius bairdii										
63		M 41	26 Jul 96	1645	N40:35.70	W125:52.68	4	73	2	On
63		M 95	5 Aug 96	1921	N37:25.44	W123:38.69	5	144	4	Off
63		J 221	27 Sep 96	1537	N42:37.18	W125:03.03	1	155	3	Off
63		M 269	13 Aug 96	1524	N32:22.94	W120:05.48	4	143	3	On
63		M 337	27 Aug 96	754	N42:06.12	W125:35.50	3	148	1	On
63		M 439	30 Aug 96	1741	N43:25.32	W127:20.50	4	148	1	On
63		M 496	7 Sep 96	1206	N47:16.48	W125:19.10	3	149	2	Off
63		M 517	11 Sep 96	756	N42:48.13	W130:52.03	5	74	1	On
Balaenoptera spp.										
70		M 18	21 Jul 96	1003	N45:46.32	W130:15.16	3	92	1	On
70		M 53	1 Aug 96	1417	N37:18.53	W126:53.34	5	147	1	Off
70		J 65	8 Sep 96	751	N33:43.66	W121:42.88	4	92	1	Off
70		M 76	4 Aug 96	1629	N37:54.26	W123:07.95	4	144	1	On
70		M 78	4 Aug 96	1632	N37:54.11	W123:07.55	4	91	1	On
70		J 104	9 Sep 96	1838	N34:30.41	W121:07.63	3	4	1	On
70		J 108	9 Sep 96	1859	N34:31.47	W121:09.42	3	154	1	On
70		J 115	10 Sep 96	725	N34:33.00	W121:12.00	2	92	1	On
70		J 120	10 Sep 96	752	N34:34.20	W121:17.45	2	4	1	On
70		J 121	10 Sep 96	817	N34:35.03	W121:22.05	2	153	1	On
70		J 124	10 Sep 96	1109	N34:39.29	W121:54.85	3	152	1	On
70		J 126	10 Sep 96	1131	N34:39.88	W121:59.24	3	92	1	On
70		J 136	10 Sep 96	1742	N34:48.08	W123:04.38	4	92	1	On
70		J 137	10 Sep 96	1748	N34:48.15	W123:05.36	4	92	1	On
70		J 139	10 Sep 96	1808	N34:48.64	W123:09.35	4	154	1	On
70		M 140	6 Aug 96	1604	N36:47.00	W122:34.31	2	143	2	On
70		M 141	6 Aug 96	1606	N36:46.93	W122:33.83	2	143	1	On
70		M 147	6 Aug 96	1648	N36:45.70	W122:25.09	3	73	1	On
70		J 169	15 Sep 96	1330	N36:36.75	W124:55.55	3	4	1	On
70		J 176	16 Sep 96	718	N37:04.71	W123:56.15	5	4	1	On
70		J 179	17 Sep 96	900	N37:49.96	W123:05.66	5	152	2	Off
70	76 75	J 180	17 Sep 96	911	N37:50.20	W123:07.70	5	4	9	Off
70		J 184	17 Sep 96	1003	N37:51.08	W123:13.61	5	154	1	Off
70		J 208	23 Sep 96	1859	N40:06.70	W124:59.56	3	4	1	On
70	75	J 219	24 Sep 96	1749	N40:19.98	W126:46.86	5	138	2	On
70		M 220	7 Aug 96	1635	N36:00.36	W123:26.65	4	147	1	On
70		J 222	28 Sep 96	1651	N43:09.90	W126:30.49	5	138	2	On
70		M 222	7 Aug 96	1712	N35:57.68	W123:33.33	4	15	1	Off
70		J 225	30 Sep 96	740	N43:26.94	W127:36.95	5	34	1	On
70		M 228	7 Aug 96	1850	N35:48.70	W123:48.53	5	74	1	On
70		J 237	8 Oct 96	1624	N45:39.20	W124:31.64	4	152	1	Off
70		M 239	8 Aug 96	1941	N33:58.53	W124:47.69	5	73	1	Off
70	74	J 254	14 Oct 96	804	N40:30.23	W128:13.29	3	4	3	On
70		M 257	12 Aug 96	1859	N32:35.43	W121:21.04	4	74	1	On

Table 7 (cont.).

Species name Code	Other Codes	Sighting Number	Date	Time	Latitude	Longitude	Bft.	Obs. no.	School size	Effort
70		J 258	14 Oct 96	1404	N40:21.06	W127:33.78	3	91	1	On
70		M 270	13 Aug 96	1810	N32:21.14	W120:00.10	4	145	1	Off
70		J 305	21 Oct 96	1753	N39:17.67	W126:31.22	1	138	2	On
70		M 307	20 Aug 96	1728	N33:14.10	W118:22.50	4	150	1	On
70	75	J 310	24 Oct 96	817	N36:04.24	W124:56.08	3	152	2	On
70	74 27	J 316	25 Oct 96	1521	N35:39.19	W121:54.73	3	154	6	On
70		J 329	27 Oct 96	830	N33:03.82	W120:11.70	3	138	2	On
70		J 334	27 Oct 96	924	N33:00.57	W120:19.73	3	138	2	On
70		J 335	27 Oct 96	926	N33:00.40	W120:20.14	3	138	3	On
70		J 336	27 Oct 96	933	N32:59.89	W120:21.37	3	154	4	On
70		J 337	27 Oct 96	933	N32:59.86	W120:21.44	3	92	1	On
70		J 339	27 Oct 96	949	N32:58.73	W120:24.20	3	138	1	On
70		J 342	27 Oct 96	954	N32:58.29	W120:25.23	3	138	2	On
70		J 346	27 Oct 96	1027	N32:55.79	W120:31.00	3	148	1	On
70		J 349	28 Oct 96	718	N31:22.18	W120:44.04	2	154	1	On
70		M 461	2 Sep 96	1740	N46:07.62	W126:18.75	3	149	1	On
70		M 462	2 Sep 96	1811	N46:04.61	W126:24.44	3	143	1	On
70		M 541	14 Sep 96	1728	N45:35.39	W128:34.96	5	74	1	On
70		M 543	14 Sep 96	1930	N45:38.16	W129:02.63	4	148	1	On
70		M 618	17 Sep 96	1443	N43:57.45	W124:32.79	1	74	1	On
70		M 742	1 Oct 96	1659	N37:59.09	W124:01.49	1	149	1	On
70		M 745	1 Oct 96	1717	N37:58.50	W123:57.74	1	149	1	On
70		M 751	1 Oct 96	1827	N37:55.06	W123:46.53	1	73	2	On
70		M 764	2 Oct 96	1054	N37:06.00	W125:08.47	2	73	1	On
70		M 771	2 Oct 96	1300	N37:09.57	W125:30.30	1	74	2	On
70		M 795	7 Oct 96	1520	N35:35.61	W121:25.81	4	148	1	On
70		M 796	7 Oct 96	1528	N35:35.99	W121:27.62	4	145	1	On
70		M 937	14 Oct 96	1257	N32:35.73	W117:56.88	3	143	1	On
Balaenoptera acutorostrata										
71		M 65	4 Aug 96	1231	N38:17.61	W123:05.91	5	15	1	Off
71		M 187	7 Aug 96	817	N36:36.67	W122:05.87	1	73	1	On
71		M 382	28 Aug 96	1359	N41:12.20	W125:53.71	2	73	1	On
71		M 460	2 Sep 96	1528	N46:14.79	W125:55.75	3	73	1	On
71		M 484	3 Sep 96	1632	N45:17.82	W125:45.35	4	145	1	On
71		M 612	17 Sep 96	1422	N43:55.80	W124:37.20	1	74	1	On
71		M 617	17 Sep 96	1437	N43:56.99	W124:33.97	1	74	1	On
71		M 749	1 Oct 96	1736	N37:56.93	W123:54.77	1	74	1	Off
71		M 880	8 Oct 96	1055	N35:18.14	W121:42.01	2	73	1	On
Balaenoptera physalus										
74		J 71	8 Sep 96	1412	N33:56.78	W121:16.19	3	34	1	On
74		J 73	8 Sep 96	1709	N34:02.28	W121:04.03	4	91	1	On
74		J 74	8 Sep 96	1717	N34:02.92	W121:02.59	4	91	1	On
74	76 75	J 82	9 Sep 96	720	N34:11.16	W120:44.00	4	138	3	On
74		J 99	9 Sep 96	1805	N34:32.50	W121:03.88	3	138	2	On
74		J 100	9 Sep 96	1831	N34:29.87	W121:06.61	3	138	2	On
74		J 101	9 Sep 96	1834	N34:30.06	W121:06.98	3	154	2	On
74		J 102	9 Sep 96	1835	N34:30.15	W121:07.16	3	4	2	On
74		J 103	9 Sep 96	1836	N34:30.29	W121:07.40	3	4	1	On
74		J 105	9 Sep 96	1839	N34:30.48	W121:07.75	3	34	1	Off
74		J 106	9 Sep 96	1856	N34:31.18	W121:08.91	3	34	1	On
74		J 109	9 Sep 96	1901	N34:31.61	W121:09.65	3	4	1	On
74		J 110	10 Sep 96	711	N34:33.00	W121:08.00	2	152	1	On

Table 7 (cont.).

Species name Code	Other Codes	Sighting Number	Date	Time	Latitude	Longitude	Bft.	Obs. no.	School size	Effort
74		J 111	10 Sep 96	714	N34:33.00	W121:09.00	2	34	1	On
74		J 112	10 Sep 96	715	N34:33.00	W121:09.00	2	152	1	On
74		J 113	10 Sep 96	717	N34:33.00	W121:10.00	2	152	1	On
74		J 114	10 Sep 96	717	N34:33.00	W121:10.00	2	152	1	On
74		J 117	10 Sep 96	737	N34:33.68	W121:14.61	2	34	1	On
74		J 118	10 Sep 96	743	N34:33.87	W121:15.70	2	152	2	On
74		J 119	10 Sep 96	745	N34:33.95	W121:16.12	2	34	2	On
74		J 123	10 Sep 96	1105	N34:39.22	W121:54.05	3	152	1	On
74		J 127	10 Sep 96	1218	N34:40.41	W122:02.92	3	152	1	On
74	22	M 138	6 Aug 96	1546	N36:47.50	W122:38.27	2	92	11	On
74		J 163	15 Sep 96	1107	N36:28.17	W125:12.74	4	138	1	On
74		J 164	15 Sep 96	1136	N36:30.94	W125:09.33	4	138	1	On
74		M 164	6 Aug 96	1832	N36:42.49	W122:02.84	3	73	4	On
74		J 170	15 Sep 96	1333	N36:37.09	W124:55.04	3	4	1	On
74		J 171	15 Sep 96	1340	N36:37.88	W124:53.87	3	4	1	On
74		J 174	15 Sep 96	1720	N36:56.54	W124:16.45	5	152	2	On
74		M 185	7 Aug 96	804	N36:37.67	W122:03.59	1	73	1	On
74		M 189	7 Aug 96	823	N36:36.18	W122:07.00	1	92	2	On
74		J 199	23 Sep 96	731	N39:19.39	W125:33.13	5	153	2	On
74		J 214	24 Sep 96	1233	N40:14.09	W126:03.61	4	91	1	Off
74		J 215	24 Sep 96	1403	N40:15.92	W126:15.88	4	92	1	On
74	75	J 217	24 Sep 96	1541	N40:18.44	W126:34.46	5	152	2	On
74		J 218	24 Sep 96	1552	N40:18.63	W126:36.66	5	152	1	On
74		M 219	7 Aug 96	1631	N36:00.58	W123:26.13	4	143	1	On
74		J 223	29 Sep 96	728	N42:27.83	W127:53.11	4	138	1	On
74		M 224	7 Aug 96	1730	N35:55.76	W123:35.98	4	73	1	On
74		M 225	7 Aug 96	1733	N35:55.52	W123:36.42	4	15	1	On
74		M 226	7 Aug 96	1749	N35:54.38	W123:38.54	4	73	1	On
74		M 227	7 Aug 96	1813	N35:52.38	W123:42.77	5	74	2	On
74		J 247	11 Oct 96	1829	N42:10.90	W129:01.43	5	152	1	On
74		J 252	13 Oct 96	1017	N41:14.63	W127:31.15	5	91	1	Off
74	70	J 254	14 Oct 96	804	N40:30.23	W128:13.29	3	4	3	On
74		J 256	14 Oct 96	1308	N40:21.12	W127:46.01	2	91	2	On
74		M 287	14 Aug 96	1130	N32:14.38	W118:55.19	2	73	1	Off
74		M 294	14 Aug 96	1527	N32:13.57	W118:33.07	3	73	1	On
74		M 296	14 Aug 96	1737	N32:12.07	W118:19.23	3	74	3	On
74		M 298	14 Aug 96	1903	N32:11.38	W118:15.12	3	74	1	On
74		J 309	22 Oct 96	1607	N36:46.19	W128:04.96	4	138	2	On
74	70 27	J 316	25 Oct 96	1521	N35:39.19	W121:54.73	3	154	6	On
74		J 327	27 Oct 96	733	N33:07.82	W120:01.89	4	91	1	On
74		J 330	27 Oct 96	848	N33:02.46	W120:14.81	3	91	1	On
74		J 331	27 Oct 96	856	N33:01.80	W120:16.25	3	153	1	On
74		J 340	27 Oct 96	952	N32:58.47	W120:24.80	3	148	1	On
74		J 341	27 Oct 96	954	N32:58.34	W120:25.11	3	92	2	On
74		J 344	27 Oct 96	1002	N32:57.67	W120:26.71	3	92	1	On
74		M 473	3 Sep 96	1022	N45:11.35	W124:44.97	3	148	1	On
74		M 483	3 Sep 96	1428	N45:15.19	W125:18.89	3	148	1	On
74		M 544	16 Sep 96	1038	N44:14.83	W125:17.67	5	148	1	On
74		M 653	26 Sep 96	1447	N40:56.94	W124:49.03	4	73	1	On
74		M 692	27 Sep 96	1659	N37:57.46	W125:18.61	2	149	1	On
74		M 760	2 Oct 96	934	N37:03.86	W124:51.96	2	113	2	On
74		M 762	2 Oct 96	1019	N37:04.93	W125:01.35	1	143	1	On
74		M 767	2 Oct 96	1223	N37:08.91	W125:22.88	1	149	2	On
74		M 768	2 Oct 96	1243	N37:09.31	W125:26.97	1	143	2	On

Table 7 (cont.).

Species name Code	Other Codes	Sighting Number	Date	Time	Latitude	Longitude	Bft.	Obs. no.	School size	Effort
74		M 769	2 Oct 96	1256	N37:09.51	W125:29.58	1	74	3	On
74		M 785	7 Oct 96	1210	N35:33.48	W121:17.16	3	143	2	Off
74		M 797	7 Oct 96	1532	N35:36.16	W121:28.42	4	145	4	On
74		M 814	7 Oct 96	1814	N35:41.28	W121:45.10	4	73	2	On
74		M 835	8 Oct 96	855	N35:27.32	W121:21.18	1	74	2	On
74		M 837	8 Oct 96	859	N35:27.05	W121:21.80	1	143	1	On
74		M 871	8 Oct 96	957	N35:22.68	W121:31.59	1	73	2	On
74		M 872	8 Oct 96	1014	N35:21.32	W121:34.65	1	148	2	On
74		M 873	8 Oct 96	1016	N35:21.14	W121:35.11	1	143	2	On
74		M 913	12 Oct 96	1815	N32:47.64	W120:46.50	5	74	3	Off
Balaenoptera musculus										
75		J 3	4 Sep 96	1622	N32:48.74	W117:25.56	4	138	2	On
75		J 7	5 Sep 96	855	N33:18.01	W118:49.95	2	155	2	On
75		J 9	5 Sep 96	1016	N33:17.48	W118:52.35	2	138	1	On
75		J 13	5 Sep 96	1228	N33:17.10	W118:57.47	1	92	1	Off
75		J 21	5 Sep 96	1457	N33:19.09	W119:10.65	1	91	1	Off
75		J 24	5 Sep 96	1620	N33:19.76	W119:13.47	3	152	1	On
75		J 27	5 Sep 96	1821	N33:21.54	W119:27.59	4	99	1	Off
75		J 28	5 Sep 96	1848	N33:21.74	W119:30.18	4	92	2	On
75		J 29	5 Sep 96	1855	N33:21.97	W119:31.40	4	92	1	On
75		J 49	6 Sep 96	1245	N33:25.26	W120:18.15	3	154	1	On
75		J 52	7 Sep 96	904	N33:37.55	W121:30.86	4	92	1	On
75		J 53	7 Sep 96	904	N33:37.55	W121:30.87	4	4	1	On
75		J 57	7 Sep 96	1305	N33:43.07	W122:08.58	4	92	1	On
75		J 63	7 Sep 96	1721	N33:43.28	W122:08.54	4	34	1	Off
75		J 64	8 Sep 96	709	N33:44.00	W121:44.99	4	138	2	On
75		M 64	4 Aug 96	939	N38:19.86	W123:12.60	5	74	2	Off
75		J 66	8 Sep 96	755	N33:43.60	W121:42.78	4	154	1	Off
75		M 66	4 Aug 96	1420	N38:15.28	W123:08.01	4	144	3	Off
75		M 67	4 Aug 96	1443	N38:11.40	W123:08.41	4	91	1	Off
75		J 68	8 Sep 96	938	N33:44.58	W121:37.97	4	152	1	On
75		J 69	8 Sep 96	1028	N33:49.67	W121:30.25	4	154	1	On
75		M 69	4 Aug 96	1452	N38:09.86	W123:08.61	4	91	2	Off
75		J 70	8 Sep 96	1121	N33:51.43	W121:27.94	3	138	1	On
75		M 70	4 Aug 96	1505	N38:07.63	W123:08.91	4	91	2	Off
75		M 71	4 Aug 96	1507	N38:07.33	W123:08.94	4	143	1	Off
75		M 72	4 Aug 96	1517	N38:05.69	W123:09.09	4	143	2	Off
75		J 72	8 Sep 96	1420	N33:57.45	W121:14.77	3	34	1	Off
75		M 74	4 Aug 96	1533	N38:02.91	W123:09.35	3	145	2	Off
75		M 75	4 Aug 96	1625	N37:54.61	W123:08.89	4	74	2	On
75		J 77	9 Sep 96	649	N34:08.72	W120:49.07	3	138	1	On
75		J 78	9 Sep 96	707	N34:10.20	W120:45.96	4	138	1	On
75	76 74	J 82	9 Sep 96	720	N34:11.16	W120:44.00	4	138	3	On
75		J 83	9 Sep 96	723	N34:11.39	W120:43.56	4	4	1	On
75		M 86	5 Aug 96	946	N37:30.77	W123:12.16	4	92	1	On
75		J 97	9 Sep 96	1657	N34:31.09	W120:54.87	4	153	1	On
75		J 107	9 Sep 96	1857	N34:31.28	W121:09.08	3	4	2	On
75		J 122	10 Sep 96	830	N34:35.37	W121:24.44	3	4	1	On
75		J 130	10 Sep 96	1330	N34:42.17	W122:17.18	3	138	1	On
75		J 138	10 Sep 96	1749	N34:48.17	W123:05.54	4	154	2	On
75		J 142	11 Sep 96	659	N34:49.58	W123:16.71	3	92	1	On
75		J 143	11 Sep 96	702	N34:49.65	W123:17.21	3	91	1	On
75		J 148	11 Sep 96	1104	N34:53.88	W123:44.37	3	155	3	On

Table 7 (cont.).

Species name Code	Other Codes	Sighting Number	Date	Time	Latitude	Longitude	Bft.	Obs. no.	School size	Effort
75		M 151	6 Aug 96	1713	N36:44.90	W122:19.81	3	73	2	On
75		J 152	14 Sep 96	935	N36:03.30	W126:27.57	3	4	1	On
75		M 157	6 Aug 96	1807	N36:43.55	W122:08.12	3	73	1	On
75		M 163	6 Aug 96	1823	N36:42.85	W122:04.79	3	73	2	On
75		M 165	6 Aug 96	1833	N36:42.45	W122:02.60	3	73	1	On
75		M 167	6 Aug 96	1842	N36:42.25	W122:00.62	3	74	3	On
75		M 170	6 Aug 96	1848	N36:42.14	W121:59.36	3	91	1	On
75		J 178	17 Sep 96	858	N37:49.93	W123:05.28	5	152	1	Off
75	76 70	J 180	17 Sep 96	911	N37:50.20	W123:07.70	5	4	9	Off
75		M 181	7 Aug 96	712	N36:38.87	W122:01.38	0	15	2	Off
75		J 182	17 Sep 96	916	N37:50.29	W123:08.55	5	4	1	Off
75		J 183	17 Sep 96	936	N37:51.18	W123:10.59	5	4	2	Off
75		M 184	7 Aug 96	804	N36:37.76	W122:03.39	1	73	1	On
75		J 187	18 Sep 96	716	N37:54.23	W123:12.56	5	91	1	On
75		J 189	18 Sep 96	758	N37:52.69	W123:16.55	5	91	1	On
75		M 192	7 Aug 96	826	N36:35.96	W122:07.51	1	73	1	On
75		J 210	24 Sep 96	722	N40:07.03	W125:07.05	2	153	1	On
75		J 216	24 Sep 96	1513	N40:17.90	W126:28.86	4	152	1	On
75	74	J 217	24 Sep 96	1541	N40:18.44	W126:34.46	5	152	2	On
75	70	J 219	24 Sep 96	1749	N40:19.98	W126:46.86	5	138	2	On
75		M 229	8 Aug 96	724	N34:45.94	W123:03.09	5	73	1	On
75		M 235	8 Aug 96	1322	N34:21.73	W123:49.58	5	74	1	On
75		M 238	8 Aug 96	1911	N33:55.61	W124:46.43	5	74	1	On
75		M 250	12 Aug 96	1656	N32:37.39	W121:43.59	3	92	1	On
75		M 251	12 Aug 96	1704	N32:37.27	W121:41.95	3	73	1	On
75		M 252	12 Aug 96	1713	N32:37.17	W121:40.31	4	92	1	On
75		M 254	12 Aug 96	1821	N32:36.13	W121:28.47	4	73	1	On
75		M 255	12 Aug 96	1844	N32:35.76	W121:24.02	4	145	1	On
75		M 256	12 Aug 96	1858	N32:35.44	W121:21.09	4	91	2	On
75		J 257	14 Oct 96	1342	N40:21.08	W127:38.34	3	91	1	On
75		M 259	12 Aug 96	1919	N32:34.90	W121:17.12	4	144	2	On
75		M 260	13 Aug 96	717	N32:33.75	W121:08.55	3	74	1	On
75		M 261	13 Aug 96	831	N32:34.73	W121:07.64	4	73	1	On
75		M 264	13 Aug 96	1056	N32:27.63	W120:49.08	3	145	1	On
75		J 271	19 Oct 96	953	N39:11.22	W126:19.04	5	153	3	Off
75		M 271	13 Aug 96	1906	N32:19.45	W119:50.79	3	74	2	On
75		M 272	13 Aug 96	1908	N32:19.41	W119:50.34	3	145	3	On
75		M 273	13 Aug 96	1917	N32:19.25	W119:48.71	3	92	2	On
75		M 274	14 Aug 96	655	N32:20.21	W119:40.85	3	74	1	On
75		M 275	14 Aug 96	714	N32:19.88	W119:36.89	2	143	1	On
75		M 276	14 Aug 96	807	N32:18.57	W119:30.75	2	143	1	On
75		M 281	14 Aug 96	1009	N32:17.47	W119:11.16	1	74	1	On
75		J 287	20 Oct 96	1434	N38:48.14	W123:52.80	6	92	7	Off
75		M 291	14 Aug 96	1350	N32:16.36	W118:49.26	2	73	1	On
75	70	J 310	24 Oct 96	817	N36:04.24	W124:56.08	3	152	2	On
75		J 314	25 Oct 96	1331	N35:43.14	W122:08.37	4	138	1	On
75		M 747	1 Oct 96	1728	N37:58.21	W123:55.62	1	74	1	Off
75		M 757	2 Oct 96	804	N37:01.48	W124:32.71	3	113	1	On
75		M 778	3 Oct 96	1116	N36:08.10	W125:28.27	1	145	1	On
75		M 786	7 Oct 96	1226	N35:32.40	W121:18.32	3	143	2	Off
75		M 791	7 Oct 96	1349	N35:31.71	W121:21.60	3	113	2	Off
75		M 800	7 Oct 96	1540	N35:36.49	W121:29.94	4	145	1	On
75		M 812	7 Oct 96	1808	N35:41.18	W121:43.66	4	73	2	On
75		M 813	7 Oct 96	1810	N35:41.22	W121:44.27	4	73	1	On

Table 7 (cont.).

Species name Code	Other Codes	Sighting Number	Date	Time	Latitude	Longitude	Bft.	Obs. no.	School size	Effort
75		M 818	8 Oct 96	816	N35:30.44	W121:14.07	1	145	2	On
75		M 876	8 Oct 96	1043	N35:18.97	W121:39.79	2	143	3	On
75		M 888	8 Oct 96	1135	N35:14.89	W121:49.04	3	148	2	On
75		M 900	9 Oct 96	937	N33:31.48	W122:13.04	4	73	1	On
75		M 912	12 Oct 96	1546	N32:37.36	W121:09.42	5	73	1	Off
75		M 938	14 Oct 96	1302	N32:36.13	W117:56.00	3	74	2	On
75		M 939	14 Oct 96	1336	N32:38.79	W117:51.87	2	73	1	Off
75		M 941	14 Oct 96	1341	N32:39.10	W117:52.75	2	73	2	Off
75		M 942	14 Oct 96	1348	N32:39.50	W117:53.92	2	73	1	Off
Megaptera novaeangliae										
76		M 68	4 Aug 96	1448	N38:10.47	W123:08.52	4	143	1	Off
76		M 77	4 Aug 96	1631	N37:54.18	W123:07.74	4	91	2	On
76		M 80	5 Aug 96	723	N37:35.24	W123:01.28	2	91	3	On
76		M 81	5 Aug 96	829	N37:35.25	W123:03.45	2	92	1	On
76	74 75	J 82	9 Sep 96	720	N34:11.16	W120:44.00	4	138	3	On
76		M 82	5 Aug 96	832	N37:34.95	W123:03.95	2	145	2	On
76		M 83	5 Aug 96	858	N37:33.93	W123:03.49	3	74	1	On
76		M 84	5 Aug 96	900	N37:33.78	W123:03.83	3	74	2	On
76		M 85	5 Aug 96	919	N37:33.42	W123:07.20	3	92	2	On
76		M 101	6 Aug 96	1214	N36:52.81	W123:16.11	3	143	1	On
76		M 104	6 Aug 96	1234	N36:52.25	W123:12.24	3	143	1	On
76		M 119	6 Aug 96	1420	N36:50.11	W122:56.09	2	73	3	On
76		M 132	6 Aug 96	1516	N36:48.34	W122:44.51	2	91	1	On
76		M 135	6 Aug 96	1529	N36:47.97	W122:41.77	2	74	1	On
76		M 136	6 Aug 96	1530	N36:47.94	W122:41.48	2	91	1	On
76		M 144	6 Aug 96	1633	N36:46.14	W122:28.08	3	92	2	On
76		M 145	6 Aug 96	1639	N36:46.00	W122:26.96	3	143	1	On
76		M 158	6 Aug 96	1810	N36:43.43	W122:07.48	3	73	1	On
76		M 159	6 Aug 96	1813	N36:43.27	W122:06.83	3	73	2	On
76		M 160	6 Aug 96	1818	N36:43.04	W122:05.71	3	145	1	On
76		M 161	6 Aug 96	1820	N36:42.98	W122:05.44	3	145	2	On
76		M 166	6 Aug 96	1835	N36:42.36	W122:02.12	3	73	3	On
76		M 168	6 Aug 96	1844	N36:42.21	W122:00.38	3	91	2	On
76		M 171	6 Aug 96	1850	N36:42.12	W121:59.07	3	74	4	On
76		M 172	6 Aug 96	1850	N36:42.12	W121:58.97	3	74	1	On
76		M 173	6 Aug 96	1855	N36:42.00	W121:57.92	3	91	2	On
76		M 174	6 Aug 96	1858	N36:41.94	W121:57.21	3	91	2	On
76		J 175	15 Sep 96	1811	N36:58.44	W124:08.91	5	154	1	On
76		M 175	6 Aug 96	1903	N36:41.83	W121:56.29	3	91	1	On
76		M 177	7 Aug 96	655	N36:39.03	W122:00.75	0	145	2	On
76		J 177	17 Sep 96	843	N37:49.62	W123:02.76	5	4	1	Off
76		M 179	7 Aug 96	657	N36:38.89	W122:01.04	0	92	3	On
76	75 70	J 180	17 Sep 96	911	N37:50.20	W123:07.70	5	4	9	Off
76		M 180	7 Aug 96	658	N36:38.75	W122:01.34	0	15	1	On
76		M 182	7 Aug 96	753	N36:38.48	W122:01.44	1	144	1	On
76		M 183	7 Aug 96	756	N36:38.28	W122:01.99	1	143	1	On
76		J 186	18 Sep 96	712	N37:54.24	W123:11.88	5	91	1	On
76		M 186	7 Aug 96	815	N36:36.83	W122:05.48	1	73	1	On
76		J 188	18 Sep 96	745	N37:53.40	W123:15.47	5	4	1	On
76		M 191	7 Aug 96	824	N36:36.08	W122:07.23	1	73	2	On
76		M 197	7 Aug 96	836	N36:35.18	W122:09.36	1	92	1	On
76		J 285	20 Oct 96	1313	N38:56.03	W123:59.06	6	138	3	Off
76		J 290	20 Oct 96	1558	N38:39.44	W123:42.04	6	99	1	Off

Table 7 (cont.).

Species name Code	Other Codes	Sighting Number	Date	Time	Latitude	Longitude	Bft.	Obs. no.	School size	Effort
76		M 451	31 Aug 96	1807	N44:09.31	W124:30.93	4	74	1	On
76		M 452	31 Aug 96	1831	N44:09.76	W124:25.47	4	74	4	Off
76		M 521	12 Sep 96	1312	N43:22.36	W124:23.27	3	145	1	Off
76		M 524	12 Sep 96	1346	N43:22.69	W124:26.02	3	145	1	Off
76		M 525	12 Sep 96	1458	N43:25.20	W124:28.29	3	149	2	Off
76		M 633	17 Sep 96	1607	N44:04.40	W124:15.62	2	143	2	On
76		M 634	17 Sep 96	1618	N44:05.27	W124:13.43	2	143	1	On
76		M 637	17 Sep 96	1654	N44:07.37	W124:12.09	3	149	1	Off
76		M 750	1 Oct 96	1825	N37:55.09	W123:47.00	1	73	4	On
76		M 783	7 Oct 96	1148	N35:33.43	W121:14.50	3	145	7	On
76		M 787	7 Oct 96	1311	N35:31.99	W121:20.11	3	148	2	Off
76		M 788	7 Oct 96	1312	N35:31.97	W121:20.21	3	148	5	Off
76		M 789	7 Oct 96	1313	N35:31.97	W121:20.22	3	113	1	Off
76		M 790	7 Oct 96	1317	N35:31.94	W121:20.42	3	74	2	Off
76		M 792	7 Oct 96	1404	N35:31.73	W121:21.99	3	148	3	Off
76		M 793	7 Oct 96	1422	N35:31.75	W121:22.48	3	74	3	Off
76		M 794	7 Oct 96	1513	N35:35.34	W121:24.51	4	74	1	On
76		M 798	7 Oct 96	1534	N35:36.26	W121:28.84	4	74	3	On
76		M 804	7 Oct 96	1616	N35:39.45	W121:35.25	4	145	2	On
76		M 806	7 Oct 96	1630	N35:39.66	W121:37.93	4	148	5	On
76		M 809	7 Oct 96	1724	N35:38.46	W121:40.19	4	74	1	On
76		M 811	7 Oct 96	1728	N35:38.60	W121:40.97	4	74	1	On
76		M 820	8 Oct 96	819	N35:30.22	W121:14.58	1	145	3	On
76		M 829	8 Oct 96	847	N35:27.97	W121:19.73	1	74	1	On
76		M 842	8 Oct 96	906	N35:26.47	W121:23.07	1	74	2	On
76		M 875	8 Oct 96	1037	N35:19.43	W121:38.82	2	143	2	On
76		M 890	8 Oct 96	1226	N35:12.49	W121:54.61	4	113	2	On
76		M 893	8 Oct 96	1244	N35:11.05	W121:57.72	4	143	1	On
76		M 899	8 Oct 96	1548	N34:59.55	W122:31.10	5	74	1	On
unid. dolphin										
77		J 1	4 Sep 96	1517	N32:52.55	W117:17.65	4	153	2	On
77		M 31	26 Jul 96	710	N41:15.89	W125:53.40	4	145	1	Off
77		M 40	26 Jul 96	1549	N40:40.08	W125:41.49	4	144	1	On
77		J 45	6 Sep 96	1049	N33:22.87	W120:08.46	3	91	18	On
77		M 54	3 Aug 96	727	N39:15.28	W125:38.95	5	15	3	On
77		J 59	7 Sep 96	1528	N33:45.20	W122:28.51	4	138	2	On
77		J 90	9 Sep 96	1106	N34:18.91	W120:24.18	4	138	5	On
77		M 115	6 Aug 96	1348	N36:51.25	W123:02.71	3	143	1	On
77		M 120	6 Aug 96	1422	N36:50.03	W122:55.67	2	145	1	On
77		J 125	10 Sep 96	1129	N34:39.78	W121:58.75	3	153	10	On
77		M 127	6 Aug 96	1456	N36:49.05	W122:48.76	2	91	10	On
77		M 129	6 Aug 96	1503	N36:48.76	W122:47.13	2	74	40	On
77		J 145	11 Sep 96	1014	N34:51.91	W123:34.56	4	153	30	On
77		M 150	6 Aug 96	1705	N36:45.13	W122:21.44	3	73	30	On
77		M 155	6 Aug 96	1802	N36:43.75	W122:09.24	3	145	80	On
77		J 166	15 Sep 96	1232	N36:32.33	W125:05.74	3	92	1	On
77		M 203	7 Aug 96	948	N36:32.28	W122:15.98	1	91	2	On
77		M 236	8 Aug 96	1759	N33:59.92	W124:37.11	5	74	30	On
77		J 242	9 Oct 96	1350	N42:33.76	W125:43.37	2	154	4	Off
77	17	J 260	16 Oct 96	1148	N39:12.52	W129:09.05	3	4	93	On
77		J 319	25 Oct 96	1734	N35:36.23	W121:35.47	5	138	5	On
77		J 323	27 Oct 96	618	N33:13.18	W119:50.00	4	152	50	On
77		J 328	27 Oct 96	817	N33:04.69	W120:09.49	3	154	30	On

Table 7 (cont.).

Species name Code	Other Codes	Sighting Number	Date	Time	Latitude	Longitude	Bft.	Obs. no.	School size	Effort
77		M 330	26 Aug 96	1146	N42:14.75	W126:21.69	3	143	10	On
77		M 340	27 Aug 96	1253	N41:53.91	W126:06.71	1	74	20	On
77		M 341	27 Aug 96	1329	N41:50.59	W126:13.39	2	145	5	On
77		M 354	27 Aug 96	1802	N41:27.57	W127:05.07	4	143	5	On
77		J 359	28 Oct 96	1255	N30:59.49	W121:33.93	2	148	50	On
77		J 361	28 Oct 96	1327	N30:56.51	W121:39.03	2	153	30	Off
77		M 363	28 Aug 96	937	N41:17.77	W126:42.65	4	74	10	On
77		M 457	2 Sep 96	932	N46:41.54	W124:45.65	2	150	3	On
77		M 463	3 Sep 96	715	N45:07.44	W124:08.02	2	73	2	On
77		M 467	3 Sep 96	751	N45:07.74	W124:15.61	2	74	6	On
77		M 478	3 Sep 96	1308	N45:14.65	W125:02.01	3	150	3	On
77		M 500	8 Sep 96	759	N45:52.00	W126:55.00	4	145	10	On
77		M 516	10 Sep 96	1931	N43:37.44	W128:57.06	3	74	10	Off
77		M 519	12 Sep 96	1009	N43:06.54	W124:35.21	3	74	3	On
77		M 520	12 Sep 96	1027	N43:06.37	W124:30.93	3	151	1	On
77	27	M 645	23 Sep 96	1859	N46:15.39	W125:21.75	5	74	17	On
77		M 753	1 Oct 96	1839	N37:54.87	W123:43.98	1	149	1	On
77		M 754	1 Oct 96	1842	N37:54.81	W123:43.37	1	149	4	On
77		M 765	2 Oct 96	1132	N37:07.03	W125:16.10	2	148	5	On
77		M 773	2 Oct 96	1528	N37:12.20	W125:59.93	4	145	8	On
77		M 774	2 Oct 96	1617	N37:13.55	W126:09.31	3	149	4	On
77		M 782	7 Oct 96	1125	N35:31.47	W121:10.36	2	143	25	On
77		M 816	8 Oct 96	808	N35:31.06	W121:12.67	1	145	1	On
77		M 824	8 Oct 96	837	N35:28.72	W121:17.97	1	145	40	On
77		M 844	8 Oct 96	913	N35:25.98	W121:24.18	1	143	10	On
77		M 865	8 Oct 96	953	N35:23.52	W121:29.91	1	73	60	On
77		M 874	8 Oct 96	1035	N35:19.61	W121:38.44	2	143	10	On
77		M 886	8 Oct 96	1131	N35:15.22	W121:48.35	3	74	10	On
77		M 897	8 Oct 96	1258	N35:09.90	W122:00.20	4	143	15	On
77	21	M 926	13 Oct 96	1228	N33:38.02	W118:53.13	2	74	45	On
77		M 947	14 Oct 96	1429	N32:41.77	W118:01.43	1	143	25	Off
77		M 956	14 Oct 96	1502	N32:43.64	W118:07.40	1	73	175	Off
unid. small whale										
78		M 22	21 Jul 96	1238	N45:44.80	W129:41.18	3	143	2	Off
78		M 208	7 Aug 96	1051	N36:27.34	W122:27.08	1	145	1	On
78		J 275	20 Oct 96	913	N39:03.30	W124:41.05	5	4	1	On
78		J 338	27 Oct 96	935	N32:59.75	W120:21.70	3	154	1	On
78		J 350	28 Oct 96	745	N31:20.22	W120:48.53	2	91	2	On
78		J 358	28 Oct 96	1111	N31:05.64	W121:19.59	2	152	1	On
78		J 371	3 Nov 96	847	N31:37.03	W121:58.71	3	138	2	On
78		J 372	3 Nov 96	1105	N31:33.82	W121:32.42	3	148	1	On
78		M 391	28 Aug 96	1429	N41:11.23	W125:46.87	1	143	1	On
78		M 465	3 Sep 96	719	N45:07.54	W124:08.94	2	145	1	On
78		M 494	7 Sep 96	1117	N47:13.75	W125:12.94	3	151	2	On
78		M 511	10 Sep 96	1057	N43:49.27	W130:11.62	3	73	3	On
78		M 542	14 Sep 96	1822	N45:36.49	W128:47.15	4	86	1	On
78		M 557	17 Sep 96	749	N43:26.07	W125:49.84	3	143	1	On
78		M 638	23 Sep 96	1354	N46:07.59	W124:05.62	5	74	1	On
unid. large whale										
79		M 24	21 Jul 96	1917	N45:42.22	W129:16.06	4	74	1	On
79		J 26	5 Sep 96	1806	N33:21.28	W119:25.06	4	153	1	On
79		J 51	7 Sep 96	743	N33:35.46	W121:16.32	5	138	2	On

Table 7 (cont.).

Species name Code	Other Codes	Sighting Number	Date	Time	Latitude	Longitude	Bft.	Obs. no.	School size	Effort
79		J 62	7 Sep 96	1700	N33:43.61	W122:11.83	4	92	2	On
79		M 63	4 Aug 96	932	N38:20.49	W123:14.12	5	145	1	Off
79		J 67	8 Sep 96	925	N33:43.37	W121:40.06	4	152	1	Off
79		M 73	4 Aug 96	1528	N38:03.79	W123:09.26	3	145	1	Off
79		J 79	9 Sep 96	712	N34:10.58	W120:45.20	4	153	1	On
79		M 79	4 Aug 96	1711	N37:51.27	W122:59.87	3	15	2	On
79		J 81	9 Sep 96	719	N34:11.07	W120:44.17	4	153	1	On
79		J 84	9 Sep 96	730	N34:11.72	W120:42.87	4	153	1	Off
79		M 116	6 Aug 96	1353	N36:51.08	W123:01.74	2	91	1	On
79		M 122	6 Aug 96	1426	N36:49.88	W122:54.84	2	73	1	On
79		J 185	18 Sep 96	708	N37:54.27	W123:11.22	5	91	2	On
79		J 370	1 Nov 96	1638	N32:49.15	W123:30.97	5	152	1	On
79		M 755	1 Oct 96	1845	N37:54.75	W123:42.65	1	73	1	On
79		M 799	7 Oct 96	1536	N35:36.32	W121:29.12	4	145	4	On
79		M 817	8 Oct 96	809	N35:31.03	W121:12.75	1	113	1	On
79		M 821	8 Oct 96	828	N35:29.46	W121:16.32	1	113	1	On
79		M 830	8 Oct 96	849	N35:27.79	W121:20.14	1	74	2	On
79		M 836	8 Oct 96	856	N35:27.28	W121:21.28	1	74	1	On
79		M 838	8 Oct 96	900	N35:26.99	W121:21.96	1	74	2	On
79		M 870	8 Oct 96	956	N35:22.81	W121:31.33	1	113	1	On
79		M 887	8 Oct 96	1134	N35:14.97	W121:48.89	3	74	1	On
Kogia simus/breviceps										
80		M 507	9 Sep 96	1818	N44:25.61	W130:36.12	0	73	1	On
unid. cetacean										
96		J 302	21 Oct 96	1329	N39:11.02	W125:36.20	0	154	4	On
96		M 435	28 Aug 96	1904	N41:04.76	W124:56.33	1	145	1	On
96		M 471	3 Sep 96	829	N45:09.38	W124:23.71	2	149	1	On
96		M 545	16 Sep 96	1141	N44:17.68	W125:10.57	5	145	1	On
96		M 550	16 Sep 96	1537	N44:15.28	W124:58.25	4	74	1	On
96		M 640	23 Sep 96	1627	N46:11.52	W124:45.24	4	148	1	On
96		M 752	1 Oct 96	1836	N37:54.91	W123:44.60	1	149	5	On
unid. object										
97		J 212	24 Sep 96	939	N40:10.90	W125:35.17	4	138	1	On
97		J 224	29 Sep 96	1122	N42:34.23	W128:45.11	4	155	1	On
97		M 861	8 Oct 96	948	N35:23.52	W121:29.91	1	113	1	On
unid. whale										
98		M 202	7 Aug 96	937	N36:33.11	W122:13.91	1	145	1	On
unid. pinniped										
PU		J 5	5 Sep 96	841	N33:17.67	W118:47.11	2	91	1	On
PU		J 6	5 Sep 96	846	N33:17.80	W118:48.05	2	91	1	On
PU		J 8	5 Sep 96	1015	N33:17.45	W118:52.15	2	138	1	On
PU		J 23	5 Sep 96	1617	N33:19.68	W119:12.90	3	152	2	On
PU		M 25	25 Jul 96	1116	N43:51.86	W124:51.62	5	91	1	Off
PU		M 32	26 Jul 96	809	N41:10.32	W125:42.12	4	73	1	Off
PU		M 62	3 Aug 96	1807	N39:16.76	W124:07.95	7	15	1	Off
PU	CU 17	J 85	9 Sep 96	810	N34:12.28	W120:40.38	4	4	418	On
PU		J 86	9 Sep 96	812	N34:12.43	W120:40.04	4	4	1	On
PU	17	J 94	9 Sep 96	1601	N34:30.06	W120:45.13	3	155	540	Off
PU		M 109	6 Aug 96	1316	N36:52.26	W123:09.00	3	73	1	On

Table 7 (cont.).

Species name Code	Other Codes	Sighting Number	Date	Time	Latitude	Longitude	Bft.	Obs. no.	School size	Effort
PU		M 110	6 Aug 96	1319	N36:52.19	W123:08.56	3	73	1	On
PU		M 111	6 Aug 96	1322	N36:52.08	W123:07.86	4	143	1	On
PU		M 113	6 Aug 96	1341	N36:51.49	W123:04.23	3	143	1	On
PU		M 117	6 Aug 96	1355	N36:51.01	W123:01.33	2	91	1	On
PU		M 118	6 Aug 96	1416	N36:50.25	W122:56.88	2	73	1	On
PU		M 131	6 Aug 96	1510	N36:48.52	W122:45.62	2	91	1	On
PU		M 133	6 Aug 96	1527	N36:48.03	W122:42.21	2	74	1	On
PU		M 134	6 Aug 96	1527	N36:48.01	W122:42.09	2	91	1	On
PU		J 135	10 Sep 96	1713	N34:47.65	W122:58.67	4	138	1	On
PU		M 154	6 Aug 96	1800	N36:43.80	W122:09.55	2	143	1	On
PU		M 206	7 Aug 96	1032	N36:28.79	W122:23.60	1	144	1	On
PU		M 217	7 Aug 96	1411	N36:11.08	W123:03.17	4	144	1	On
PU		M 249	12 Aug 96	1612	N32:37.99	W121:51.99	3	143	1	On
PU		M 258	12 Aug 96	1903	N32:35.32	W121:20.22	4	91	1	On
PU		M 265	13 Aug 96	1249	N32:25.50	W120:36.31	4	143	1	On
PU		J 277	20 Oct 96	950	N39:02.45	W124:33.45	5	154	1	On
PU		M 278	14 Aug 96	858	N32:19.01	W119:26.04	1	145	1	On
PU		M 289	14 Aug 96	1346	N32:16.47	W118:49.83	2	91	1	On
PU		M 327	26 Aug 96	728	N42:11.07	W125:29.55	2	149	1	On
PU		M 336	27 Aug 96	724	N42:08.66	W125:29.67	3	143	1	On
PU		M 338	27 Aug 96	1018	N42:04.18	W125:39.97	3	143	1	On
PU		J 351	28 Oct 96	803	N31:19.08	W120:51.15	2	138	1	On
PU		M 372	28 Aug 96	1311	N41:13.34	W126:04.22	3	74	1	On
PU		J 374	3 Nov 96	1327	N31:31.23	W121:11.65	3	92	1	On
PU		J 376	4 Nov 96	930	N31:21.46	W119:55.81	3	138	1	On
PU		J 378	4 Nov 96	1318	N31:17.85	W119:27.45	3	138	1	On
PU		M 398	28 Aug 96	1502	N41:10.36	W125:39.30	1	145	1	On
PU		M 446	31 Aug 96	1253	N44:17.25	W125:43.96	4	143	1	On
PU		M 472	3 Sep 96	931	N45:10.31	W124:33.72	3	143	1	On
PU		M 477	3 Sep 96	1306	N45:14.62	W125:01.66	3	143	1	On
PU		M 491	5 Sep 96	838	N46:33.79	W128:33.38	4	149	1	On
PU		M 577	17 Sep 96	1144	N43:44.67	W125:01.77	1	74	1	On
PU		M 672	27 Sep 96	1117	N38:24.01	W124:22.73	1	145	1	On
PU		M 674	27 Sep 96	1233	N38:19.12	W124:33.62	1	143	1	On
PU		M 676	27 Sep 96	1238	N38:18.72	W124:34.66	1	143	1	On
PU		M 693	27 Sep 96	1748	N37:56.76	W125:18.46	1	113	1	On
PU		M 700	28 Sep 96	902	N37:47.42	W125:37.99	2	113	1	On
PU		M 720	30 Sep 96	1525	N38:13.09	W125:57.20	1	143	1	On
PU		M 726	30 Sep 96	1815	N38:08.30	W125:21.05	3	74	1	On
PU		M 730	1 Oct 96	1046	N38:04.85	W125:00.55	1	143	1	On
PU		M 733	1 Oct 96	1138	N38:05.10	W124:49.69	2	145	1	On
PU		M 734	1 Oct 96	1236	N38:04.20	W124:40.37	2	148	1	On
PU		M 770	2 Oct 96	1258	N37:09.54	W125:29.97	1	143	1	On
PU		M 851	8 Oct 96	930	N35:24.78	W121:26.99	1	73	2	On
PU		M 852	8 Oct 96	934	N35:24.52	W121:27.58	1	73	2	On
PU		M 862	8 Oct 96	950	N35:23.52	W121:29.91	1	73	1	On
PU		M 863	8 Oct 96	952	N35:23.52	W121:29.91	1	73	1	On
PU		M 866	8 Oct 96	954	N35:22.94	W121:31.06	1	73	1	Off
PU		M 868	8 Oct 96	955	N35:22.90	W121:31.13	1	73	1	On
unid. sea lion										
UO		M 30	26 Jul 96	649	N41:18.64	W125:57.15	4	92	1	Off
UO		M 39	26 Jul 96	1420	N40:48.75	W125:26.11	3	74	1	On
UO		M 52	1 Aug 96	801	N37:25.90	W127:41.02	5	74	1	On

Table 7 (cont.).

Species name Code	Other Codes	Sighting Number	Date	Time	Latitude	Longitude	Bft.	Obs. no.	School size	Effort
UO		J 56	7 Sep 96	1302	N33:43.00	W122:07.95	4	92	1	On
UO		M 99	6 Aug 96	1151	N36:53.24	W123:20.72	4	92	1	On
UO		M 102	6 Aug 96	1230	N36:52.38	W123:13.05	3	92	1	On
UO		M 103	6 Aug 96	1233	N36:52.28	W123:12.46	3	74	1	On
UO		M 153	6 Aug 96	1719	N36:44.71	W122:18.54	3	15	1	On
UO		J 209	23 Sep 96	1906	N40:06.85	W125:01.12	2	138	1	On
UO		J 232	2 Oct 96	1308	N45:21.09	W124:36.48	5	4	1	On
UO		M 246	12 Aug 96	1237	N32:44.05	W122:34.29	2	74	1	On
UO		M 253	12 Aug 96	1756	N32:36.57	W121:33.43	4	91	2	On
UO		M 262	13 Aug 96	1029	N32:29.87	W120:53.86	3	74	1	On
UO		M 279	14 Aug 96	924	N32:18.62	W119:20.49	1	74	1	On
UO		M 282	14 Aug 96	1013	N32:17.38	W119:10.43	1	92	1	On
UO		M 283	14 Aug 96	1028	N32:16.97	W119:07.34	1	145	1	On
UO		M 284	14 Aug 96	1042	N32:16.51	W119:04.35	1	92	1	On
UO		M 292	14 Aug 96	1415	N32:16.10	W118:45.50	2	145	1	On
UO		J 295	21 Oct 96	1108	N39:07.26	W125:08.14	2	153	1	On
UO		M 376	28 Aug 96	1319	N41:13.20	W126:02.47	3	74	1	On
UO		M 479	3 Sep 96	1322	N45:14.85	W125:05.36	2	143	1	On
UO		M 551	16 Sep 96	1616	N44:14.04	W124:49.95	4	145	1	On
UO		M 576	17 Sep 96	1138	N43:44.46	W125:02.98	1	149	1	On
UO		M 628	17 Sep 96	1516	N44:00.02	W124:25.74	1	149	1	On
UO		M 903	9 Oct 96	1624	N33:09.37	W123:02.42	4	74	1	On
UO		M 907	11 Oct 96	1330	N31:54.08	W124:08.73	4	74	1	On
UO		M 928	13 Oct 96	1318	N33:41.67	W118:45.23	2	145	1	On
UO		M 957	14 Oct 96	1504	N32:43.72	W118:07.65	1	145	1	Off
Eumetopias jubatus										
EJ	16	M 929	13 Oct 96	1324	N33:42.01	W118:44.20	2	74	13	On
EJ	17 05	M 930	13 Oct 96	1355	N33:43.61	W118:40.39	2	74	36	On
EJ		M 934	14 Oct 96	1023	N32:24.33	W118:21.25	3	148	1	On
Zalophus californianus										
ZC	17	J 4	5 Sep 96	725	N33:15.23	W118:37.63	1	91	153	On
ZC	22	J 15	5 Sep 96	1316	N33:18.43	W119:04.28	1	92	11	On
ZC		J 17	5 Sep 96	1340	N33:18.89	W119:07.46	1	154	1	On
ZC		J 19	5 Sep 96	1451	N33:19.25	W119:09.71	1	91	1	On
ZC	22	J 20	5 Sep 96	1453	N33:19.31	W119:10.15	1	152	55	Off
ZC	22	J 22	5 Sep 96	1550	N33:19.37	W119:10.10	1	152	28	On
ZC		J 25	5 Sep 96	1756	N33:21.07	W119:23.26	4	138	1	On
ZC		J 30	6 Sep 96	732	N33:23.56	W119:43.06	1	154	1	On
ZC		J 31	6 Sep 96	734	N33:23.59	W119:43.44	1	154	3	On
ZC		J 32	6 Sep 96	740	N33:23.70	W119:44.44	1	154	1	On
ZC	17	J 33	6 Sep 96	749	N33:23.89	W119:45.95	1	91	59	On
ZC		J 34	6 Sep 96	817	N33:25.22	W119:48.99	1	138	1	On
ZC		J 36	6 Sep 96	821	N33:25.34	W119:49.68	1	138	1	On
ZC	22	J 37	6 Sep 96	823	N33:25.40	W119:50.08	1	91	52	On
ZC		J 38	6 Sep 96	825	N33:25.45	W119:50.39	1	138	1	On
ZC	22	J 39	6 Sep 96	852	N33:26.08	W119:53.57	2	92	77	On
ZC	22	J 40	6 Sep 96	936	N33:24.88	W119:59.28	2	138	50	On
ZC	22	J 41	6 Sep 96	940	N33:25.03	W120:00.19	2	92	56	Off
ZC		J 42	6 Sep 96	955	N33:25.43	W120:03.00	2	92	1	On
ZC	22	J 43	6 Sep 96	958	N33:25.51	W120:03.47	2	152	15	On
ZC		J 44	6 Sep 96	1046	N33:22.82	W120:08.32	3	155	1	On
ZC		J 46	6 Sep 96	1114	N33:23.43	W120:09.03	3	152	1	On

Table 7 (cont.).

Species name Code	Other Codes	Sighting Number	Date	Time	Latitude	Longitude	Bft.	Obs. no.	School size	Effort
ZC		J 47	6 Sep 96	1118	N33:23.70	W120:09.74	3	91	1	On
ZC	22	J 48	6 Sep 96	1122	N33:23.94	W120:10.45	3	152	52	On
ZC		J 50	6 Sep 96	1547	N33:29.10	W120:28.52	4	138	5	On
ZC		J 54	7 Sep 96	1001	N33:39.25	W121:41.03	4	91	1	On
ZC		M 61	3 Aug 96	1425	N39:46.07	W124:36.66	7	92	1	Off
ZC		J 80	9 Sep 96	717	N34:10.93	W120:44.48	4	4	1	On
ZC	22	M 88	5 Aug 96	1242	N37:23.61	W123:26.83	6	92	3	Off
ZC		J 88	9 Sep 96	854	N34:14.44	W120:33.23	4	152	1	On
ZC		M 94	5 Aug 96	1832	N37:18.47	W123:34.77	5	91	1	Off
ZC		J 96	9 Sep 96	1650	N34:30.89	W120:53.52	4	92	1	On
ZC		M 97	6 Aug 96	947	N36:56.66	W123:46.30	4	73	1	On
ZC		M 121	6 Aug 96	1423	N36:50.00	W122:55.53	2	73	1	On
ZC	22 27 44	M 123	6 Aug 96	1429	N36:49.78	W122:54.31	2	145	2200	On
ZC		M 130	6 Aug 96	1508	N36:48.60	W122:46.16	2	74	1	On
ZC		J 134	10 Sep 96	1425	N34:43.41	W122:27.63	3	153	1	On
ZC		M 143	6 Aug 96	1617	N36:46.63	W122:31.48	2	143	1	On
ZC		M 152	6 Aug 96	1717	N36:44.78	W122:19.11	3	92	1	On
ZC		J 191	18 Sep 96	903	N37:54.11	W123:28.58	5	138	1	On
ZC		M 200	7 Aug 96	851	N36:34.03	W122:12.04	1	143	1	On
ZC		J 201	23 Sep 96	1345	N39:43.40	W124:35.99	2	91	1	On
ZC		M 209	7 Aug 96	1052	N36:27.26	W122:27.27	1	144	1	On
ZC		M 277	14 Aug 96	841	N32:19.26	W119:29.46	1	145	1	On
ZC		M 280	14 Aug 96	1004	N32:17.62	W119:12.39	1	145	1	On
ZC		M 285	14 Aug 96	1118	N32:15.53	W118:57.38	2	143	1	On
ZC		M 288	14 Aug 96	1336	N32:16.80	W118:51.74	2	145	1	On
ZC		M 290	14 Aug 96	1349	N32:16.37	W118:49.33	2	73	1	On
ZC		M 299	20 Aug 96	1049	N32:56.83	W117:17.83	2	149	1	Off
ZC		M 300	20 Aug 96	1052	N32:57.47	W117:18.00	2	143	1	Off
ZC		M 305	20 Aug 96	1639	N33:11.23	W118:13.78	4	145	1	On
ZC	17	J 317	25 Oct 96	1652	N35:37.53	W121:43.35	5	92	332	On
ZC		J 318	25 Oct 96	1724	N35:36.26	W121:37.49	5	138	1	On
ZC		J 320	25 Oct 96	1744	N35:36.22	W121:33.47	5	153	1	On
ZC		J 321	25 Oct 96	1754	N35:36.22	W121:31.52	5	92	1	On
ZC		M 322	26 Aug 96	714	N42:10.60	W125:26.36	1	73	1	On
ZC		J 324	27 Oct 96	624	N33:12.83	W119:50.87	4	71	1	On
ZC	17	J 325	27 Oct 96	631	N33:12.32	W119:52.02	4	152	216	On
ZC		J 375	4 Nov 96	731	N31:24.40	W120:18.73	3	71	1	On
ZC		M 428	28 Aug 96	1800	N41:05.07	W125:11.02	2	149	1	Off
ZC		M 469	3 Sep 96	805	N45:08.20	W124:18.72	2	145	1	On
ZC		M 480	3 Sep 96	1327	N45:14.91	W125:06.70	2	74	1	Off
ZC		M 528	12 Sep 96	1845	N43:40.51	W124:34.96	4	149	1	Off
ZC		M 591	17 Sep 96	1328	N43:50.50	W124:47.80	1	143	1	On
ZC		M 644	23 Sep 96	1806	N46:13.97	W125:09.35	4	145	1	On
ZC		M 801	7 Oct 96	1543	N35:36.63	W121:30.59	4	145	1	On
ZC		M 805	7 Oct 96	1626	N35:39.61	W121:37.21	4	145	1	On
ZC		M 807	7 Oct 96	1630	N35:39.66	W121:37.93	4	145	1	On
ZC	22	M 810	7 Oct 96	1727	N35:38.58	W121:40.86	4	74	68	On
ZC		M 823	8 Oct 96	836	N35:28.82	W121:17.76	1	113	1	On
ZC		M 825	8 Oct 96	841	N35:28.45	W121:18.62	1	145	1	On
ZC		M 826	8 Oct 96	844	N35:28.23	W121:19.12	1	74	5	On
ZC		M 831	8 Oct 96	852	N35:27.54	W121:20.69	1	74	3	On
ZC		M 832	8 Oct 96	854	N35:27.47	W121:20.84	1	143	1	On
ZC		M 833	8 Oct 96	855	N35:27.36	W121:21.06	1	143	1	On
ZC		M 834	8 Oct 96	855	N35:27.36	W121:21.06	1	143	1	On

Table 7 (cont.).

Species name Code	Other Codes	Sighting Number	Date	Time	Latitude	Longitude	Bft.	Obs. no.	School size	Effort
ZC		M 839	8 Oct 96	902	N35:26.82	W121:22.30	1	143	1	On
ZC		M 840	8 Oct 96	903	N35:26.73	W121:22.49	1	74	1	On
ZC		M 841	8 Oct 96	905	N35:26.56	W121:22.88	1	74	1	On
ZC		M 843	8 Oct 96	912	N35:26.07	W121:23.98	1	74	1	On
ZC		M 848	8 Oct 96	921	N35:25.45	W121:25.37	1	73	1	On
ZC		M 853	8 Oct 96	935	N35:24.48	W121:27.68	1	73	1	On
ZC		M 855	8 Oct 96	936	N35:24.37	W121:27.91	1	73	4	On
ZC		M 856	8 Oct 96	939	N35:24.12	W121:28.47	1	73	1	On
ZC		M 857	8 Oct 96	944	N35:23.77	W121:29.32	1	73	1	On
ZC		M 858	8 Oct 96	946	N35:23.59	W121:29.71	1	113	4	On
ZC		M 860	8 Oct 96	948	N35:23.52	W121:29.91	1	73	2	On
ZC		M 864	8 Oct 96	952	N35:23.52	W121:29.91	1	73	2	On
ZC		M 867	8 Oct 96	954	N35:22.94	W121:31.06	1	73	1	On
ZC		M 877	8 Oct 96	1045	N35:18.79	W121:40.23	2	145	1	On
ZC		M 878	8 Oct 96	1046	N35:18.73	W121:40.39	2	145	1	On
ZC		M 884	8 Oct 96	1106	N35:17.30	W121:43.95	2	145	1	On
ZC		M 889	8 Oct 96	1138	N35:14.65	W121:49.53	3	74	1	On
ZC		M 927	13 Oct 96	1303	N33:40.82	W118:48.06	2	145	1	On
ZC		M 943	14 Oct 96	1404	N32:40.40	W117:56.80	1	143	2	Off
ZC		M 945	14 Oct 96	1407	N32:40.59	W117:57.44	1	148	4	Off
ZC		M 946	14 Oct 96	1419	N32:41.22	W117:59.57	1	148	4	Off
ZC		M 951	14 Oct 96	1445	N32:42.66	W118:04.36	1	148	1	Off
ZC		M 955	14 Oct 96	1500	N32:43.50	W118:07.02	1	145	1	Off
unid. fur seal										
UA		M 266	13 Aug 96	1257	N32:25.35	W120:34.71	4	143	1	On
UA		J 367	31 Oct 96	1415	N31:05.08	W124:32.60	3	154	1	On
Callorhinus ursinus										
CU		M 26	25 Jul 96	1643	N43:38.37	W125:21.99	5	92	1	Off
CU		M 28	25 Jul 96	1835	N43:18.62	W125:21.87	5	73	1	Off
CU		M 29	25 Jul 96	1947	N43:06.84	W125:21.92	5	92	1	Off
CU		M 37	26 Jul 96	1020	N41:12.50	W125:22.08	5	74	1	Off
CU		M 51	31 Jul 96	1700	N37:28.95	W128:12.30	4	92	1	On
CU		J 58	7 Sep 96	1334	N33:43.64	W122:13.58	4	4	1	On
CU	17 PU	J 85	9 Sep 96	810	N34:12.28	W120:40.38	4	4	418	On
CU		J 87	9 Sep 96	843	N34:13.52	W120:35.09	4	153	1	On
CU		M 90	5 Aug 96	1259	N37:21.37	W123:25.78	6	143	1	Off
CU		M 91	5 Aug 96	1335	N37:16.96	W123:23.51	6	92	1	Off
CU		M 92	5 Aug 96	1341	N37:16.23	W123:23.11	6	144	1	Off
CU		M 93	5 Aug 96	1638	N37:16.17	W123:29.98	5	144	1	Off
CU		M 98	6 Aug 96	1116	N36:54.20	W123:27.99	4	91	1	On
CU		M 100	6 Aug 96	1204	N36:53.02	W123:18.22	3	143	1	On
CU		M 105	6 Aug 96	1235	N36:52.23	W123:12.05	3	143	1	On
CU		M 106	6 Aug 96	1236	N36:52.17	W123:11.73	3	143	1	On
CU		M 107	6 Aug 96	1238	N36:52.11	W123:11.29	3	143	1	On
CU		M 108	6 Aug 96	1311	N36:52.44	W123:10.10	3	92	1	On
CU		M 112	6 Aug 96	1338	N36:51.57	W123:04.70	3	143	1	On
CU		M 124	6 Aug 96	1443	N36:49.39	W122:51.52	2	74	1	On
CU		M 125	6 Aug 96	1445	N36:49.32	W122:50.96	2	74	1	On
CU		M 126	6 Aug 96	1451	N36:49.17	W122:49.67	2	74	3	On
CU		J 131	10 Sep 96	1349	N34:42.64	W122:20.81	3	92	1	On
CU		J 132	10 Sep 96	1404	N34:42.97	W122:23.59	3	92	1	On
CU		J 172	15 Sep 96	1417	N36:41.70	W124:48.09	3	154	1	On

Table 7 (cont.).

Species name Code	Other Codes	Sighting Number	Date	Time	Latitude	Longitude	Bft.	Obs. no.	School size	Effort
CU		M 201	7 Aug 96	852	N36:33.97	W122:12.15	1	143	1	On
CU		J 202	23 Sep 96	1357	N39:44.49	W124:33.88	2	138	1	On
CU		M 204	7 Aug 96	955	N36:31.73	W122:17.12	1	73	2	On
CU		M 205	7 Aug 96	1020	N36:29.71	W122:21.52	1	91	1	On
CU		M 207	7 Aug 96	1045	N36:27.85	W122:25.83	1	144	1	On
CU		M 211	7 Aug 96	1107	N36:25.94	W122:29.98	1	15	1	On
CU		M 212	7 Aug 96	1122	N36:26.03	W122:31.15	1	143	1	On
CU		M 213	7 Aug 96	1127	N36:25.46	W122:32.21	1	143	1	On
CU		M 214	7 Aug 96	1131	N36:25.05	W122:32.95	1	15	1	On
CU		M 215	7 Aug 96	1137	N36:24.55	W122:33.88	1	143	1	On
CU		J 231	2 Oct 96	1114	N45:14.77	W124:53.33	5	155	1	On
CU		J 234	2 Oct 96	1442	N45:28.70	W124:19.12	6	152	1	On
CU		M 263	13 Aug 96	1052	N32:27.93	W120:49.84	3	145	2	On
CU		M 267	13 Aug 96	1317	N32:24.98	W120:30.83	4	143	1	On
CU		M 268	13 Aug 96	1407	N32:24.34	W120:20.92	4	91	1	On
CU		J 303	21 Oct 96	1434	N39:12.27	W125:50.35	1	138	1	On
CU		J 312	24 Oct 96	1346	N35:56.28	W124:04.42	3	154	1	On
CU		M 312	26 Aug 96	701	N42:10.05	W125:23.30	1	73	2	On
CU		J 313	25 Oct 96	1310	N35:43.62	W122:12.50	4	92	1	On
CU		M 313	26 Aug 96	703	N42:10.14	W125:23.77	1	73	1	On
CU		M 314	26 Aug 96	703	N42:10.14	W125:23.77	1	73	1	On
CU		M 315	26 Aug 96	703	N42:10.15	W125:23.82	1	73	1	On
CU		M 316	26 Aug 96	707	N42:10.30	W125:24.61	1	73	1	On
CU		M 317	26 Aug 96	709	N42:10.39	W125:25.09	1	149	1	On
CU		M 319	26 Aug 96	711	N42:10.45	W125:25.48	1	73	1	On
CU		M 320	26 Aug 96	712	N42:10.52	W125:25.89	1	149	1	On
CU		M 323	26 Aug 96	716	N42:10.66	W125:26.81	1	86	1	On
CU		M 324	26 Aug 96	717	N42:10.72	W125:27.10	1	86	1	On
CU		M 325	26 Aug 96	720	N42:10.81	W125:27.67	2	149	1	On
CU		M 346	27 Aug 96	1534	N41:40.56	W126:37.05	2	143	1	On
CU		J 348	27 Oct 96	1711	N32:31.82	W121:32.92	3	92	1	On
CU		M 352	27 Aug 96	1655	N41:34.06	W126:52.77	2	73	1	On
CU		J 353	28 Oct 96	921	N31:14.66	W121:03.83	2	138	1	On
CU		M 369	28 Aug 96	1303	N41:13.46	W126:05.91	3	74	1	On
CU		J 373	3 Nov 96	1306	N31:31.77	W121:15.46	3	138	1	On
CU		M 374	28 Aug 96	1315	N41:13.27	W126:03.34	3	143	1	On
CU		M 377	28 Aug 96	1322	N41:13.15	W126:01.88	3	143	1	On
CU		M 384	28 Aug 96	1402	N41:12.10	W125:53.01	2	73	1	On
CU		M 390	28 Aug 96	1427	N41:11.29	W125:47.42	1	148	1	On
CU		M 421	28 Aug 96	1713	N41:08.14	W125:18.60	1	74	1	On
CU		M 456	2 Sep 96	919	N46:42.53	W124:43.06	2	145	1	On
CU		M 552	16 Sep 96	1817	N44:08.51	W124:22.95	3	148	1	On
CU		M 573	17 Sep 96	1113	N43:43.03	W125:08.15	1	74	1	On
CU		M 574	17 Sep 96	1130	N43:44.09	W125:04.83	1	145	1	On
CU		M 584	17 Sep 96	1309	N43:49.06	W124:51.91	1	143	1	On
CU		M 585	17 Sep 96	1310	N43:49.17	W124:51.61	1	143	1	On
CU		M 589	17 Sep 96	1317	N43:49.70	W124:50.10	1	143	1	On
CU		M 595	17 Sep 96	1339	N43:51.35	W124:45.41	1	143	1	On
CU		M 596	17 Sep 96	1339	N43:51.35	W124:45.41	1	148	1	On
CU		M 600	17 Sep 96	1351	N43:52.23	W124:43.01	1	145	1	On
CU		M 602	17 Sep 96	1353	N43:52.29	W124:42.90	1	145	1	On
CU		M 624	17 Sep 96	1506	N43:59.20	W124:27.84	1	145	1	On
CU		M 662	27 Sep 96	858	N38:34.84	W123:57.69	1	149	1	On
CU		M 663	27 Sep 96	902	N38:34.51	W123:58.43	1	149	1	On

Table 7 (cont.).

Species name Code	Other Codes	Sighting Number	Date	Time	Latitude	Longitude	Bft.	Obs. no.	School size	Effort
CU		M 664	27 Sep 96	948	N38:30.98	W124:06.68	1	148	1	On
CU		M 665	27 Sep 96	1011	N38:29.21	W124:10.80	1	73	1	On
CU		M 666	27 Sep 96	1020	N38:28.44	W124:12.54	1	73	1	On
CU		M 667	27 Sep 96	1028	N38:27.87	W124:13.95	1	145	1	On
CU		M 675	27 Sep 96	1235	N38:18.96	W124:34.05	1	143	1	On
CU		M 677	27 Sep 96	1248	N38:18.01	W124:36.45	1	73	1	On
CU		M 708	28 Sep 96	1400	N37:38.65	W126:04.22	2	73	1	On
CU		M 721	30 Sep 96	1611	N38:12.18	W125:47.30	2	145	1	On
CU		M 728	1 Oct 96	941	N38:07.66	W125:11.48	2	74	1	On
CU		M 731	1 Oct 96	1053	N38:04.98	W124:59.08	2	143	1	On
CU		M 847	8 Oct 96	918	N35:25.63	W121:24.94	1	143	1	On
CU		M 859	8 Oct 96	947	N35:23.57	W121:29.78	1	73	1	On
CU		M 879	8 Oct 96	1053	N35:18.27	W121:41.68	2	145	1	On
CU		M 891	8 Oct 96	1237	N35:11.61	W121:56.53	4	145	1	On
CU		M 892	8 Oct 96	1239	N35:11.50	W121:56.76	4	113	1	On
CU		M 894	8 Oct 96	1253	N35:10.36	W121:59.13	4	143	1	On
CU		M 895	8 Oct 96	1253	N35:10.32	W121:59.21	4	143	1	On
CU		M 896	8 Oct 96	1256	N35:10.07	W121:59.80	4	74	1	On
CU		M 898	8 Oct 96	1300	N35:09.81	W122:00.41	4	143	1	On
CU		M 911	12 Oct 96	1540	N32:36.79	W121:10.57	5	143	1	Off
Mirounga angustirostris										
MA		M 6	18 Jul 96	1328	N47:39.80	W125:56.70	4	73	1	On
MA		M 11	19 Jul 96	912	N46:55.38	W127:52.44	4	92	1	Off
MA		M 12	20 Jul 96	813	N46:19.55	W129:25.29	5	73	1	On
MA		M 14	20 Jul 96	1431	N46:49.64	W128:09.07	4	91	1	On
MA		M 33	26 Jul 96	849	N41:06.86	W125:33.88	4	143	1	Off
MA		M 38	26 Jul 96	1324	N40:58.39	W125:22.69	3	73	1	Off
MA		M 45	27 Jul 96	1138	N40:14.92	W126:42.06	3	73	1	On
MA		J 128	10 Sep 96	1310	N34:41.75	W122:13.28	3	4	1	On
MA		J 144	11 Sep 96	938	N34:50.90	W123:27.36	4	92	1	On
MA		J 173	15 Sep 96	1643	N36:53.98	W124:22.82	4	92	1	On
MA		J 205	23 Sep 96	1749	N40:03.32	W124:44.06	1	91	1	On
MA		J 206	23 Sep 96	1801	N40:04.49	W124:45.99	2	91	1	On
MA		J 213	24 Sep 96	1120	N40:13.61	W125:57.13	4	155	1	On
MA		J 238	9 Oct 96	1127	N42:50.43	W125:21.50	2	91	1	Off
MA		J 240	9 Oct 96	1240	N42:42.03	W125:33.12	2	91	1	Off
MA		J 243	9 Oct 96	1607	N42:19.11	W126:04.95	3	4	1	Off
MA		J 248	12 Oct 96	1841	N41:26.30	W127:56.14	4	4	1	On
MA		J 261	16 Oct 96	1421	N39:01.14	W129:35.88	2	138	1	On
MA		J 262	16 Oct 96	1608	N38:51.89	W129:57.22	1	152	1	On
MA		J 263	16 Oct 96	1620	N38:50.83	W129:59.76	1	91	1	On
MA		J 294	21 Oct 96	1047	N39:06.63	W125:03.83	2	92	1	On
MA		J 297	21 Oct 96	1226	N39:10.45	W125:22.52	2	91	1	On
MA		J 298	21 Oct 96	1231	N39:10.53	W125:23.53	2	91	1	On
MA		J 299	21 Oct 96	1257	N39:10.64	W125:29.15	1	91	1	On
MA		J 300	21 Oct 96	1302	N39:10.67	W125:30.37	0	154	2	On
MA		J 301	21 Oct 96	1307	N39:10.71	W125:31.28	0	154	1	On
MA		J 304	21 Oct 96	1513	N39:13.32	W125:56.95	1	153	1	On
MA		J 307	22 Oct 96	1052	N37:08.91	W127:14.34	3	154	1	On
MA		M 339	27 Aug 96	1040	N42:02.44	W125:44.50	3	149	1	On
MA		M 345	27 Aug 96	1531	N41:40.81	W126:36.45	2	73	1	On
MA		M 371	28 Aug 96	1310	N41:13.36	W126:04.46	3	74	1	On
MA		M 388	28 Aug 96	1414	N41:11.71	W125:50.30	2	73	1	On

Table 7 (cont.).

Species name Code	Other Codes	Sighting Number	Date	Time	Latitude	Longitude	Bft.	Obs. no.	School size	Effort
MA		M 397	28 Aug 96	1454	N41:10.54	W125:41.23	0	143	1	On
MA		M 416	28 Aug 96	1702	N41:08.56	W125:21.05	1	143	1	On
MA		M 450	31 Aug 96	1653	N44:11.07	W124:48.32	4	143	1	On
MA		M 458	2 Sep 96	1003	N46:39.14	W124:52.21	3	74	1	On
MA		M 476	3 Sep 96	1258	N45:14.39	W124:59.02	3	145	1	On
MA		M 503	8 Sep 96	1922	N45:21.87	W128:17.72	4	73	1	On
MA		M 560	17 Sep 96	808	N43:27.69	W125:45.84	3	143	1	On
MA		M 563	17 Sep 96	919	N43:33.26	W125:31.57	1	148	1	On
MA		M 564	17 Sep 96	920	N43:33.26	W125:31.28	1	143	1	On
MA		M 572	17 Sep 96	1106	N43:42.45	W125:09.52	1	149	1	On
MA		M 578	17 Sep 96	1149	N43:44.88	W125:00.54	1	143	1	On
MA		M 582	17 Sep 96	1253	N43:47.88	W124:55.11	1	143	1	On
MA		M 641	23 Sep 96	1638	N46:11.81	W124:48.06	4	113	1	On
MA		M 642	23 Sep 96	1648	N46:12.13	W124:50.54	4	145	1	On
MA		M 656	26 Sep 96	1611	N40:55.14	W125:06.53	3	145	1	On
MA		M 668	27 Sep 96	1031	N38:27.62	W124:14.52	1	145	1	On
MA		M 671	27 Sep 96	1102	N38:25.15	W124:20.08	1	148	1	On
MA		M 678	27 Sep 96	1258	N38:17.24	W124:38.35	1	73	1	On
MA		M 679	27 Sep 96	1305	N38:16.68	W124:39.74	1	73	1	On
MA		M 680	27 Sep 96	1308	N38:16.47	W124:40.26	1	149	1	On
MA		M 681	27 Sep 96	1349	N38:13.08	W124:47.87	2	143	1	On
MA		M 682	27 Sep 96	1402	N38:11.91	W124:50.34	2	73	1	On
MA		M 684	27 Sep 96	1422	N38:10.27	W124:53.92	2	145	1	On
MA		M 689	27 Sep 96	1611	N38:02.71	W125:12.47	2	143	1	On
MA		M 691	27 Sep 96	1641	N37:59.48	W125:16.94	1	143	1	On
MA		M 717	30 Sep 96	1449	N38:12.07	W126:07.67	2	149	1	On
MA		M 718	30 Sep 96	1451	N38:12.07	W126:07.67	2	73	1	On
MA		M 719	30 Sep 96	1502	N38:12.53	W126:01.95	1	149	1	On
MA		M 722	30 Sep 96	1614	N38:12.12	W125:46.75	2	73	1	On
MA		M 725	30 Sep 96	1744	N38:09.67	W125:27.51	3	145	1	On
MA		M 727	30 Sep 96	1833	N38:07.91	W125:17.21	3	74	1	On
MA		M 732	1 Oct 96	1117	N38:05.49	W124:54.19	2	148	1	On
MA		M 740	1 Oct 96	1524	N37:59.24	W124:18.26	2	145	1	Off
MA		M 759	2 Oct 96	928	N37:03.70	W124:50.69	2	149	1	On
MA		M 776	3 Oct 96	1105	N36:08.35	W125:30.62	1	74	1	On
MA		M 845	8 Oct 96	915	N35:25.89	W121:24.38	1	74	1	On
MA		M 869	8 Oct 96	955	N35:22.86	W121:31.21	1	113	1	On
MA		M 883	8 Oct 96	1103	N35:17.58	W121:43.41	2	73	1	On
MA		M 885	8 Oct 96	1119	N35:16.18	W121:46.32	3	73	1	On
MA		M 910	12 Oct 96	1451	N32:32.78	W121:19.26	5	73	1	Off
MA		M 933	14 Oct 96	1004	N32:22.68	W118:24.54	2	143	1	On
MA		M 936	14 Oct 96	1251	N32:35.26	W117:57.94	3	143	1	On
MA		M 940	14 Oct 96	1339	N32:38.96	W117:52.36	2	73	1	Off
MA		M 944	14 Oct 96	1406	N32:40.55	W117:57.29	1	143	1	Off
MA		M 948	14 Oct 96	1431	N32:41.85	W118:01.68	1	143	1	Off
MA		M 949	14 Oct 96	1442	N32:42.45	W118:03.69	1	73	1	Off
MA		M 950	14 Oct 96	1443	N32:42.52	W118:03.90	1	145	1	Off
MA		M 952	14 Oct 96	1447	N32:42.76	W118:04.66	1	145	1	Off
MA		M 953	14 Oct 96	1449	N32:42.87	W118:05.02	1	73	1	Off
MA		M 954	14 Oct 96	1454	N32:43.14	W118:05.87	1	145	1	Off
MA		M 958	14 Oct 96	1505	N32:43.79	W118:07.85	1	73	1	Off
MA		M 959	14 Oct 96	1513	N32:44.30	W118:09.37	0	145	1	Off

Table 8. Chronological record of dive interval data, including date, sighting number (SI #), species identification, mean group size (GS), range of Beaufort sea states (BEAUF), range of swell heights in feet (SWELL), clock times at surface (UP) and for dives (DOWN), and durations of dives (DIVETIME) and surface periods (SURFTIME). Times are in the format HH:MM:SS. Dives are defined as any time longer than 1 minute when no animals are visible and, for asynchronously diving groups, does not correspond to dive times of individual whales.

Date	SI #	SPECIES	GS	Beauf	Swell	UP	DOWN	DIVETIME	SURFTIME
McArthur									
072196	21	Physeter macrocephalus	17	3-3	4-4	11:53:00	13:22:00	00:00	89:00
								Continuous near-surface travel for 1 hr 29 min with no dives longer than 1 minute.	
072696	41	Berardius bairdii	11	4-4	5-5		16:48:35		
						16:55:51	17:00:45	07:16	04:54
						17:15:00	17:19:15	14:45	04:15
						18:10:00	18:12:01	50:45	02:01
						18:32:08	18:34:55	20:07	02:47
						18:51:20	18:55:09	16:25	03:49
						19:06:55	19:10:02	11:46	03:07
						19:38:05	19:41:40	28:03	03:35
080496	64	Balaenoptera musculus	9	5-4	6-4	09:47:48	09:50:38		02:50
						09:53:40		03:02	
						10:06:00	10:09:49		03:49
						10:12:45	10:24:45	02:56	12:00
080896	229	Baleanoptera musculus	2	5-5	5-5	07:36:41	07:39:36		02:55
						07:48:40	07:50:49	09:04	02:09
						07:57:30	08:00:49	06:48	03:19
						08:03:07	08:03:23	02:18.	00:16
						08:10:27	08:11:33	07:04	01:06
						08:23:35	08:25:28	12:02	01:53
081396	260	Baleanoptera musculus	2	3-4	3-3	07:38:00	07:39:06		01:06
						07:43:13	07:45:44	04:07	02:31
						07:53:42	07:55:38	07:58	01:56
						08:00:04	08:03:04	04:22	03:00
						08:07:22	08:10:58	04:18	03:36

Table 8 (cont.).

Date	SI #	SPECIES	GS	Beauf	Swell	UP	DOWN	DIVETIME	SURFTIME
081396	269	Berardius bairdii	7	4-4	5-4		15:25:55		
						16:20:15	16:21:41	54:40	01:26
						17:24:03	17:25:14	62:22	01:11
						17:39:57	17:41:43	14:43	01:46
						17:47:15	17:49:35	05:32	02:20
082696	337	Berardius bairdii	2	3-3	3-1	07:54:45	07:57:25		02:40
						07:58:42	08:00:53	01:17	02:11
						08:33:07	08:40:13	32:14	07:06
081396	501	Physeter macrocephalus	8	4-4	4-4	08:13:56	08:52:10	00:00	48:14
								4 subgroups, some whales were visible every minute.	
091696	549	Physeter macrocephalus	1	4-4	9-9		14:33:29		
						14:40:52	14:49:26	07:23	08:34
						14:52:04	15:03:33	02:30	11:29
David Starr Jordan									
100196	226	Physeter macrocephalus	1	3-3	3-3	07:44	07:47		03:00
						08:25	08:31	38:00	06:00
						09:08	09:18	37:00	10:00
						09:55		37:00	RHIB very close to whales at 10:00.
101496	255	Physeter macrocephalus	40	3-3	9-9	09:46:22	09:54:20	4 Subgroups	07:58
						10:01:19	10:15:36	06:59	14:17
						10:24:46	10:26:57	09:10	02:11
						10:30:35	10:50:25	03:38	19:50
						11:00:27		10:02	

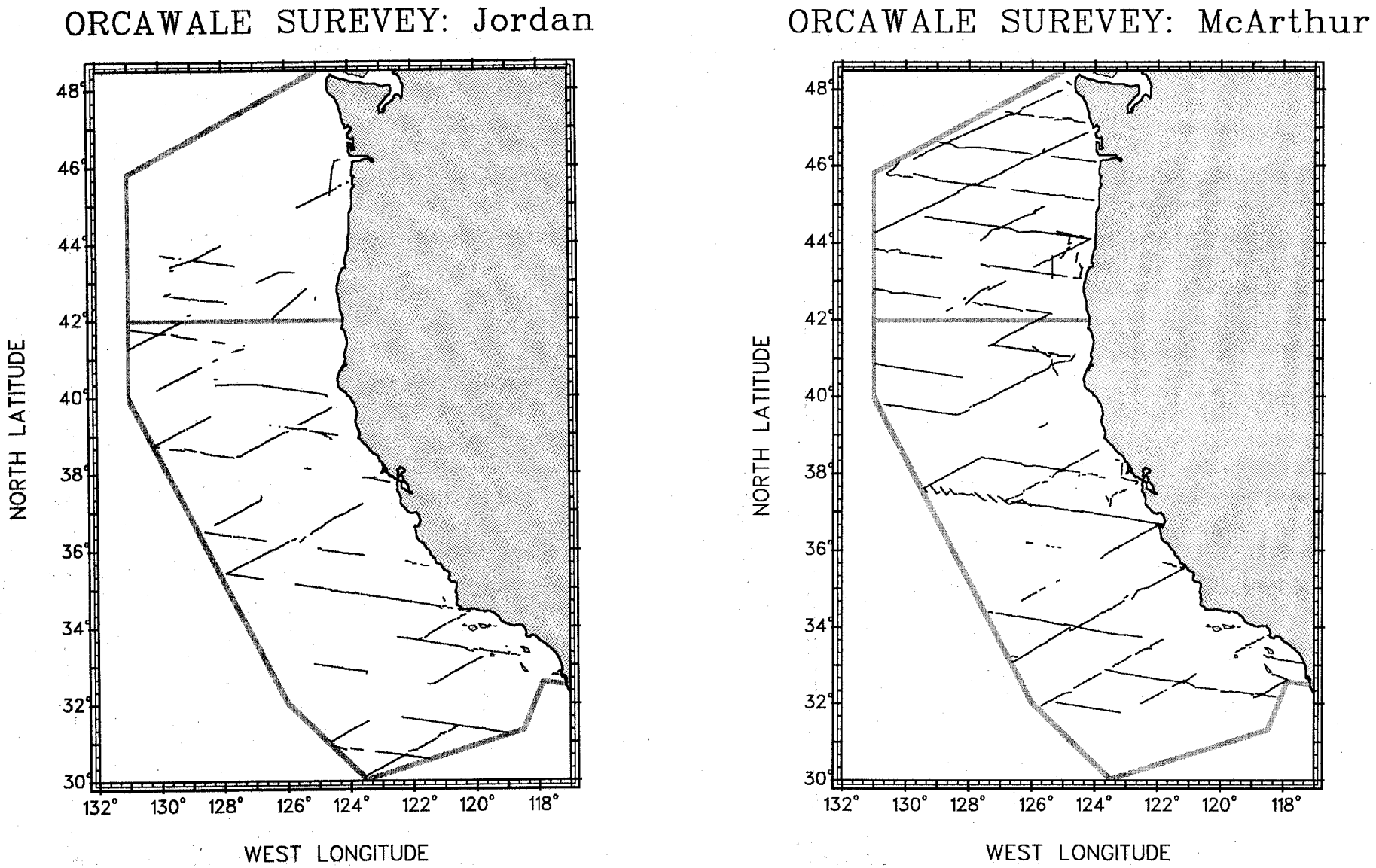


Figure 1. Tracklines completed by the NOAA ships Jordan and McArthur during the 1996 ORCAWALE cetacean survey.

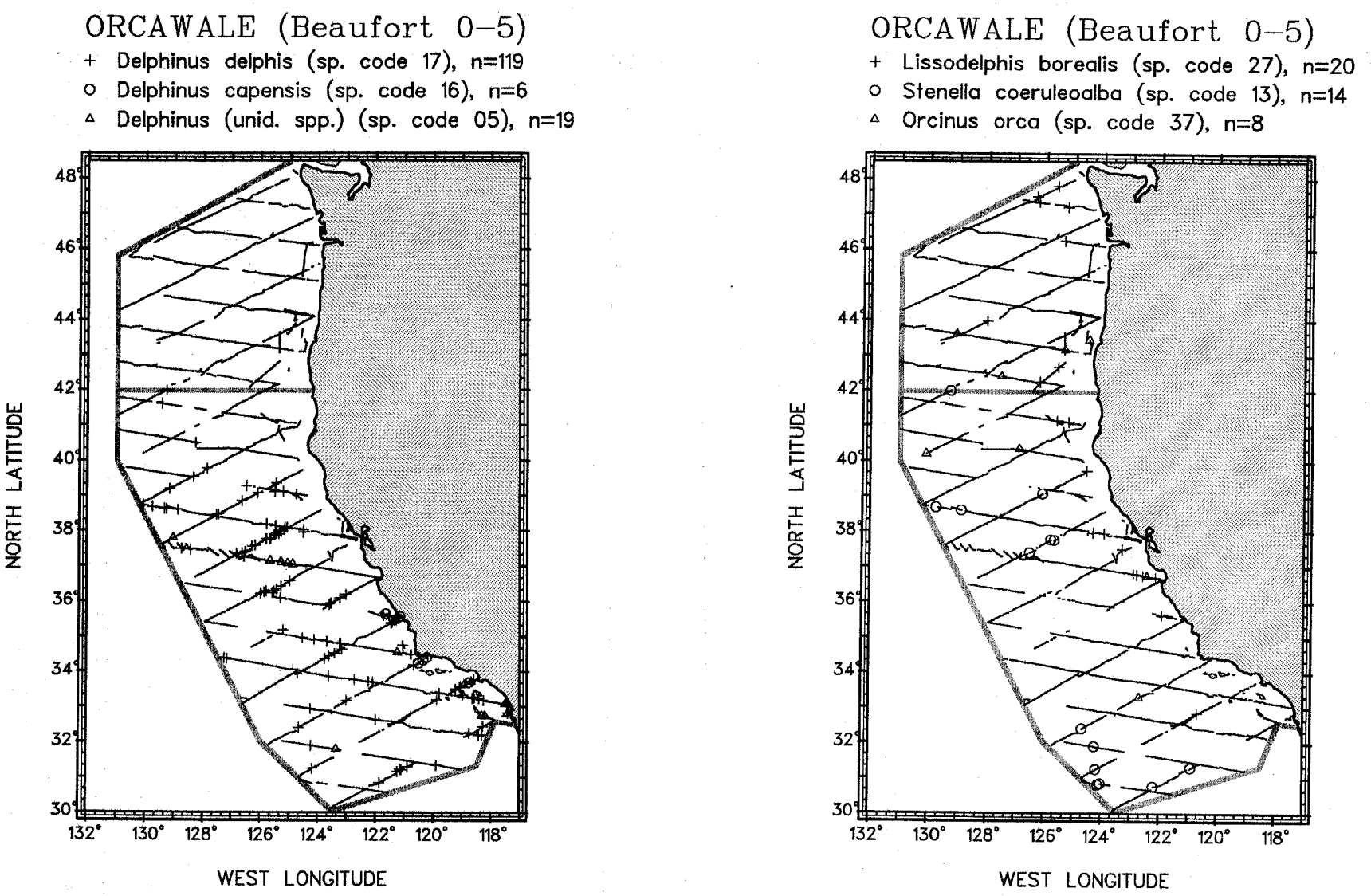


Figure 2. Transect lines and sighting locations of short-beaked common dolphins (*Delphinus delphis*), long-beaked common dolphins (*Delphinus capensis*), unidentified common dolphins (*Delphinus* spp.), northern right whale dolphins (*Lissodelphis borealis*), striped dolphins (*Stenella coeruleoalba*) and killer whales (*Orcinus orca*). Horizontal line at 42°N is an extension of the CA/OR border.

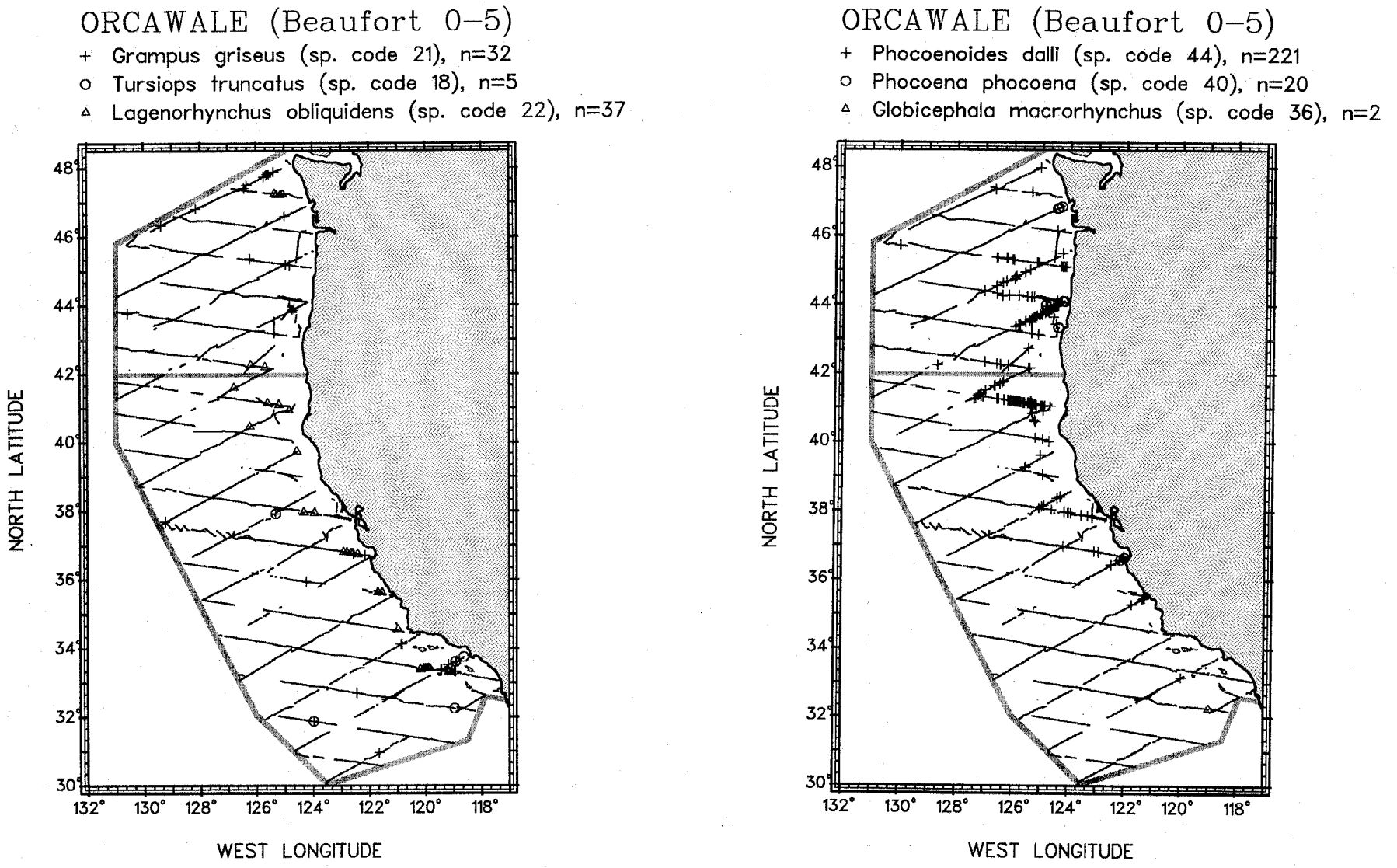


Figure 3. Transect lines and sighting locations of Risso's dolphins (*Grampus griseus*), bottlenose dolphins (*Tursiops truncatus*), Pacific white-sided dolphins (*Lagenorhynchus obliquidens*), harbor porpoises (*Phocoena phocoena*), Dall's porpoises (*Phocoenoides dalli*), and pilot whales (*Globicephala macrorhynchus*). Horizontal line at 42°N is an extension of the CA/OR border.

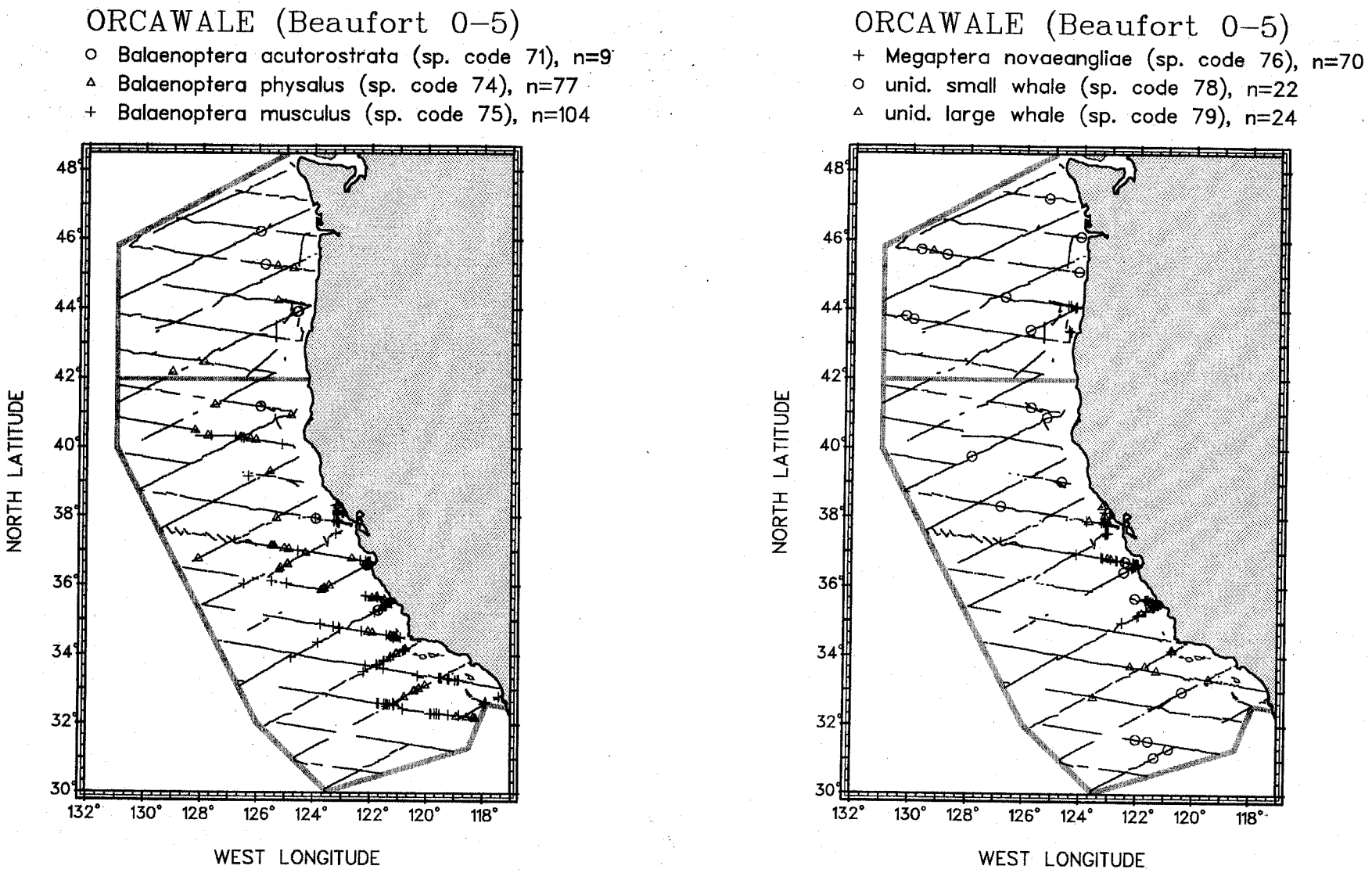
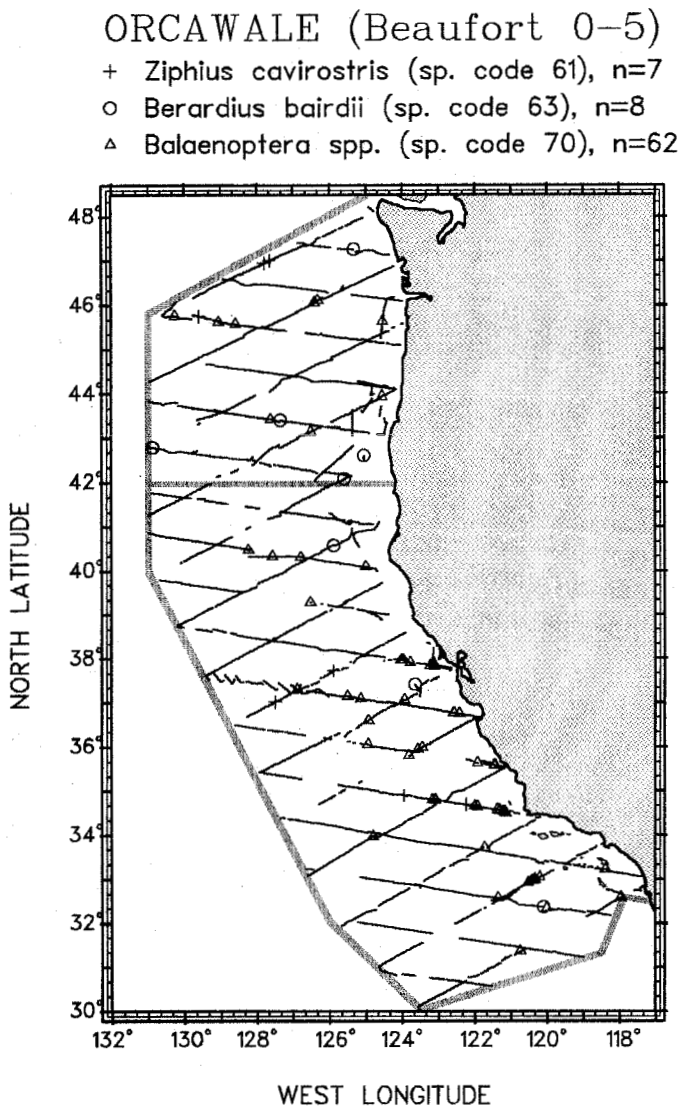


Figure 4. Transect lines and sighting locations of minke whales (*Balaenoptera acutorostrata*), fin whales (*Balaenoptera physalus*), blue whales (*Balaenoptera musculus*), humpback whales (*Megaptera novaeangliae*), unidentified small whales, and unidentified large whales. Horizontal line at 42°N is an extension of the CA/OR border.



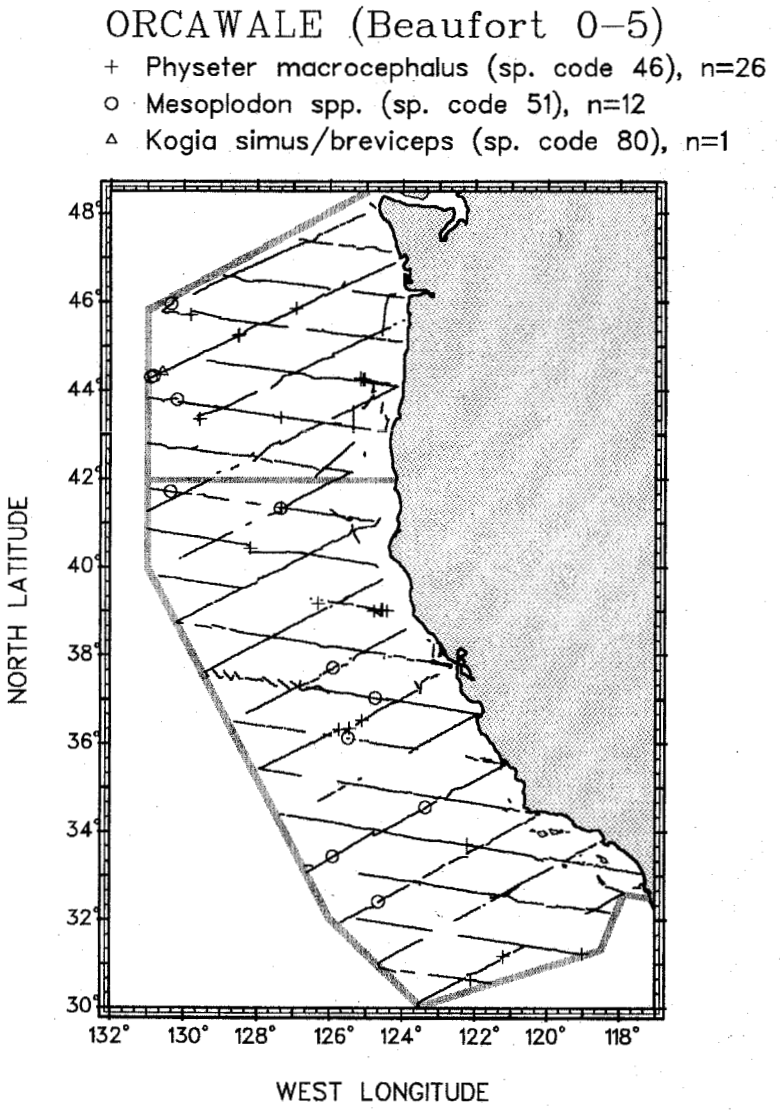
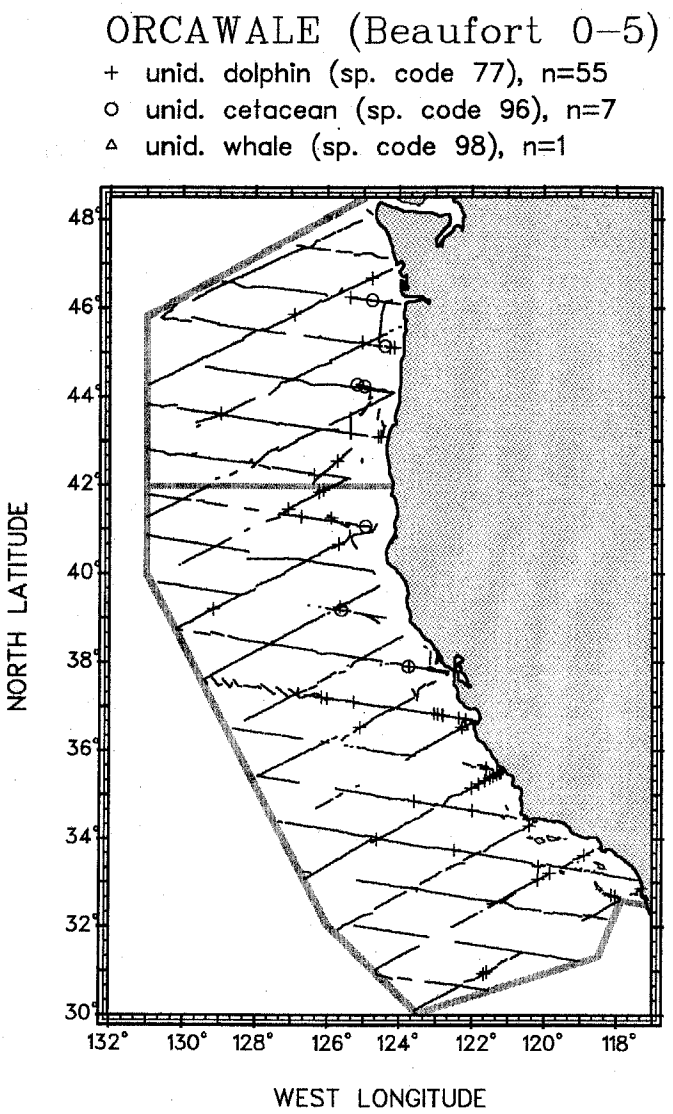


Figure 5. Transect lines and sighting locations of Cuvier's beaked whales (*Ziphius cavirostris*), Baird's beaked whales (*Berardius bairdii*), unidentified rorquals (*Balaenoptera* spp.), sperm whales (*Physeter macrocephalus*), unidentified mesoplodont beaked whales (*Mesoplodon* spp.), and dwarf or pygmy sperm whales (*Kogia* spp.). Horizontal line at 42°N is an extension of the CA/OR border.



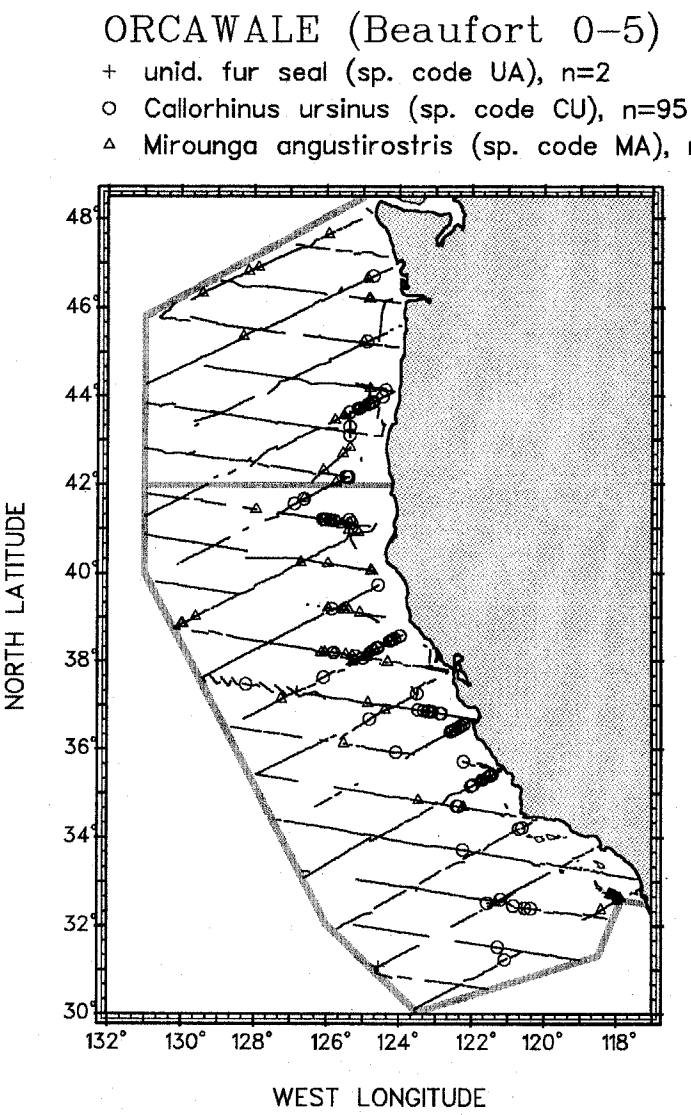


Figure 6. Transect lines and sighting locations of unidentified dolphins, unidentified cetaceans, unidentified whales, unidentified fur seals, northern fur seals (*Callorhinus ursinus*), and northern elephant seals (*Mirounga angustirostris*). Horizontal line at 42°N is an extension of the CA/OR border.

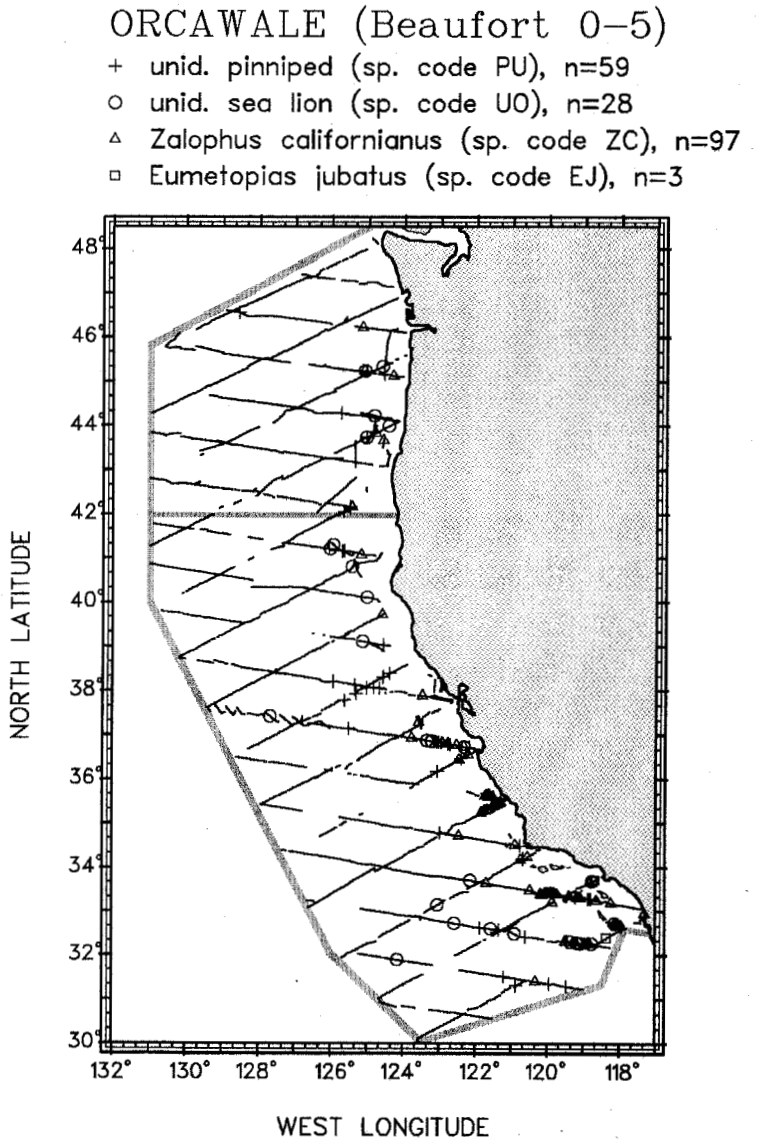


Figure 7. Transect lines and sighting locations of unidentified pinnipeds, unidentified sea lions, California sea lions (*Zalophus californianus*), and northern sea lions (*Eumetopias jubatus*). Horizontal line at 42°N is an extension of the CA/OR border.

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