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REPORT OF A MARINE MAMMAL SURVEY OF THE EASTERN TROPICAL PACIFIC ABOARD THE RESEARCH VESSEL McARTHUR JULY 28 - DECEMBER 6, 1988

Stephanie N. Sexton
Rennie S. Holt
Alan Jackson

NOAA-TM-NMFS-SWFC-128

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

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REPORT OF A MARINE MAMMAL SURVEY OF THE EASTERN TROPICAL PACIFIC ABOARD THE RESEARCH VESSEL McARTHUR JULY 28 - DECEMBER 6, 1988

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In 1984, as a result of an amendment to the Marine Mammal Protection Act of 1972, the National Marine Fisheries Service (NMFS) was mandated to conduct a research program to monitor trends in the abundance of stocks of dolphins in the eastern tropical Pacific (ETP). These dolphins are killed incidentally during fishing operations by the U. S. purse seine fishery for yellowfin tuna (Thunnus albacares). In 1986, the Southwest Fisheries Center (SWFC) of the NMFS initiated a six-year program to monitor these stocks of dolphins. In the first two years of the program (1986 and 1987), two surveys of marine mammal populations in the ETP were conducted concurrently each year aboard the National Oceanic and Atmospheric Administration vessels the David Starr Jordan and the McArthur. The surveys lasted 120 days each. In 1988, the third two surveys were conducted during the same time period and using the same vessels.

In this report, we describe the experimental procedures used during the 1988 surveys and we present summaries of the distance searched and marine mammals encountered from aboard the McArthur (Cruise AR 88-02; SWFC Observer Cruise 1165). A separate report of the David Starr Jordan cruise has been published by Holt and Sexton (1989). A report of environmental data collected during the survey is reported by Lierheimer et al. (1989).

SURVEY OBJECTIVES

The primary objective of the cruise was to collect information to calculate relative abundance of dolphin species in the ETP that are taken incidentally by the purse seine fishery for yellowfin tuna. Specific objectives were to collect information to:

1. estimate school density, school size, and species composition of each species taken by the fishery;

2. investigate the physical and biological environment of the affected species; and

3. contribute to on-going U.S. and international programs investigating oceanography and ocean-atmosphere interactions in the ETP.

MATERIALS AND METHODS

Study Area and Itinerary

The McArthur traversed predetermined tracklines in the ETP from July 28 through December 6, 1988 (Figure 1), with scheduled port calls in Hilo, Hawaii; Rodman Naval Station, Panama; and Callao, Peru. The itinerary of the vessel included four segments or effort legs:

Leg 1.			
	Departed	San Diego	July 28
	Arrived	Hilo	August 26
Leg 2.			
	Departed	Hilo	August 31
	Arrived	Rodman NS	September 30
Leg 3.			
	Departed	Rodman NS	October 4
	Arrived	Callao	November 2
Leg 4.			
	Departed	Callao	November 7
	Arrived	San Diego	December 6

The McArthur also conducted bird censuses on the Archipelago del Colon (Ecuador), Isla de Malpelo (Colombia), and the Isla del Coco (Guatemala).

Scientific Personnel

Cruise Leaders	Legs
Rennie Holt, SWFC	1
Steve Reilly, SWFC	2
Andrew Dizon, SWFC	3
Douglas DeMaster, SWFC	4
Identification Specialists	
Michael Newcomer, SWFC	1-2
Scott Sinclair, SWFC	1-2
Marc Webber, SWFC	3-4
Richard LeDuc, SWFC	3-4

Observers

Sallie Beavers, SWFC	1-2
William Irwin, SWFC	1-2
Keith Rittmaster, SWFC	1-2
Victoria Thayer, SWFC	1-2
Scott Benson, SWFC	3-4
Carrie Fried, SWFC	3-4
Joe Raffetto, SWFC	3-4
David Skordal, SWFC	3-4

Bird Census and Oceanographic Specialists

John Gill, Contractor	1
Karen Bluth, Contractor	1
Jim Caretta, Contractor	2
Michele Roest, Contractor	2-3
Robert Pitman, SWFC	3-4
Lisa Ballance, SWFC	4

Marine Mammal Species Surveyed

During the survey, the observers recorded information on all species of whales and dolphins sighted throughout the cruise. However, encounter rates are presented only for dolphin species.

Equipment

The McArthur, commissioned in 1966, is 53.3 m in length and 11.6 m in breadth, and has a 3.7 m draft. During the surveys, the vessel maintained a cruising speed of approximately 18.5 km/hr.

Several pieces of equipment were used to gather data. The geographic position of the vessel was recorded periodically and at the time of a marine mammal sighting using the vessel's Satellite Navigation System (SAT NAV). Marine mammals were detected with port and starboard pedestal mounted 25X Fuginon[1] binoculars and a variety of hand-held 7-15X binoculars. The glasses were mounted on the upper deck approximately 10.7 m above the sea surface. Surface temperature and salinity, fluorescence (chlorophyll), and temperature-depth profiles were obtained using a thermosalinograph, fluorometer, and expendable bathythermograph (XBT), respectively. Discrete conductivity and temperature-depth profiles were also obtained using conductivity-temperature-depth (CTD) probes.

The bearing and radial distances of marine mammals from the vessel were calculated using two methods. First, the Computer

[1]Reference to trade name does not imply endorsement by the NMFS.

Assisted Sighting Technology (CAST) system used information from several sensors to measure sighting angles and then to calculate radial distances. A CAMAC[1] computer collected data from various sources: the vessel's course from the gyroscope; the electronically encoded train angles of the 25X binoculars; a measurement of the relative motion of the vessel from a pitch-roll sensor; speed from the speed log; and information concerning survey status, such as identification of observers occupying survey positions from data pads located on the flying bridge. An IBM-compatible computer, which was interfaced with the CAMAC, was then used to process information to determine the sighting angle to the cue. Successive sighting angles, recorded as the vessel traveled along the trackline, were used to calculate radial distances. Analyses of CAST data will be presented in a separate report.

The second method was the use of estimates of the bearing and radial distance of a school from the vessel, which were recorded by the observers using a 360° graduated washer attached to the base of the 25X binoculars and graduated reticles enclosed in the right eye piece of the binoculars.

A 35 mm F-1 Canon[1] camera with motor drive was used to photograph animals to aid in stock and species identification. The system included 400 mm, 75-210 mm zoom, and 28 mm lens. Some observers also used personal camera equipment to photograph sightings. Animals were also recorded on 1.27 cm video tape using a Panasonic[1] VHS recorder and a Panasonic[1] camera equipped with telephoto lens.

Duty Stations

Three duty stations were used during the survey, with observers rotating through each station.

1. Left Binocular - The port-side observer used a 25X binocular, mounted on the port side of the vessel to scan the ocean for marine mammal sighting cues. The major area of responsibility for this observer was from the midpoint of the trackline to abeam the port-side of the vessel and outward to the horizon or to the extent possible with prevailing environmental conditions.

2. Right Binocular - The starboard observer used a 25X binocular, mounted on the starboard side of the vessel, to search from the midpoint of the trackline to abeam the right side of the vessel; and outward to the horizon or to the extent possible with prevailing environmental conditions. Observers in the left and right positions frequently searched areas on the opposite side of the tracklines.

3. Recorder - The recorder's duties were to transcribe effort data at regular intervals, to make notes of information pertaining to each sighting, and, when possible, to search the trackline adjacent to the vessel with hand held binoculars for schools not detected by the observers on the 25X glasses.

Observer Teams and Rotation

Two teams of three observers each alternately occupied the three duty stations. Each team was on duty for two-hour shifts. During each shift members spent approximately equal time occupying each duty station. Two of the six observers were experts in identifying marine mammals. These two identification specialists were assigned to separate teams so that one would always be on duty. The other four observers were systematically assigned to a team. Team members remained constant during the entire survey. Team members rotated among the duty stations and teams rotated on and off duty without interrupting searching effort. Teams alternated completing the first watch of the day. Observers aboard the Jordan and McArthur switched vessels after the second leg.

Data Collection Procedures

A typical day's searching activity began at sunrise, approximately 0630 hours local time, and ended at sunset, approximately 1830 hours local time. The searching procedure was initiated when observers were occupying the duty stations and a recorder was in place to record information on the Research Vessel Effort Form (Figure 2). The vessel traversed a predetermined trackline at a constant speed of approximately 18.5 km/hr. Except for approximately two to three hours per night when oceanographic data were collected, the vessel maintained its speed and course between sunset and sunrise to provide wider spatial distribution of searching effort.

When a sighting cue (marine mammals, birds, splashes, etc.) was detected, it was determined if the cue was a marine mammal and if the cue was appropriate for tracking using the CAST system. Schools that were not tracked included whales, dolphins detected close to the vessel or at distances greater than 5.6 km lateral to the vessel, small schools of dolphins (<15 animals), and schools detected during poor sighting conditions. If tracking was appropriate, the searching effort was terminated and the observer began tracking by turning on a switch attached to the binocular stand. With the vessel still on course and with the school in the field of view of the binoculars, the CAST system recorded successive bearings of the animals to the vessel. After approximately 8 minutes the vessel was directed towards the cue and the tracking continued for another 8 minutes. When the target was not in the field of view, the switch was deactivated until the target was again sighted. At the end of the tracking sequence, if the target was lost from view and not resighted, or if the cue was

not a marine mammal, the tracking procedure was terminated. All marine mammal schools were approached to obtain estimates of school size and species composition. The searching mode was resumed when the vessel returned to course and speed and the observers resumed searching for other sighting cues.

During each marine mammal sighting, the recorder collected data to complete Research Vessel Effort and Research Vessel Sighting forms (Figure 3). Definition of each data element is given by Ralston[2]. Criteria for assigning sun position and sea state conditions are given in Figure 4 and Table 1, respectively. Observers recorded bearing and range for schools using the 360° washer and reticle increments. The reticle measurements were converted to km using

$$a = 0.003942 \tan (\arctan (45242.52) - 0.001088\ r),$$

where a equals radial distance in km and r denotes the number of reticles below the topmost reticle. Values in this equation were calculated by Barlow (per. comm.) using an equation presented by Smith (1982) and data collected during previous research vessel cruises.

Each observer who had a good view of the school independently recorded in his or her logbook an estimate of school size and a determination of species composition. All available observers determined species identification and animal behavior, and a consensus was entered on the Research Vessel Sighting and Research Vessel Continuation Forms (Figure 5) at the time of a sighting. Species identifications were validated when possible by photographing the school at close range using 35 mm and video cameras.

Data Analyses

Data were recorded for each Beaufort sea state and then grouped into (1) "calm" sea state conditions without whitecaps (Beaufort numbers 0-2) or (2) "rough" sea state conditions with whitecaps (Beaufort numbers 3-5). The presence of whitecaps was important in searching for sighting cues. Animal splashes could not be used as a sighting cue during rough seas because whitecaps were easily confused with the animal splashes.

Sun location was recorded by noting its horizontal and vertical position relative to the vessel (Figure 4). Visibility effects were investigated by classifying sun positions into "good" and "poor" categories defined by the effect of the glare from the

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[2]Ralston, F. Ms. Usage procedures and coding notes for research vessel sighting and effort records. Southwest Fisheries Center. P.O. Box 271, La Jolla, CA. 92038.

sun on the trackline. Criteria used were those described in Holt (1987). Poor sun conditions were recorded only when horizontal sun position was 12 and vertical position was 1, 2, or 3 or when there were clouds together with fog or rain. All other conditions were good conditions.

The study area was divided into four strata, with the sum of the four strata comprising the total study area (Figure 1). The sum of the three northern most strata (inshore, middle and west) constitute the northern stratum and represents the range of the northern offshore stock of spotted dolphins (species most critically impacted by the fishery). Data were analysed using information by stratum, summed over strata and pooled over strata.

The rate of encountering marine mammal schools was determined as the simple ratio of sightings detected per 1000 km searched. The standard error of the encounter rate was calculated as

$$Var(n/L) = [\Sigma l_i[(n_i/l_i) - (n/L)]^2]/L(R - 1)$$

where n equals the number of dolphin schools detected in the survey, L equals the km searched, l_i equals km searched during the ith day, n_i equals schools detected during the ith day, and R equals number of days searched.

Encounter rates were calculated for all dolphin schools that were detected during Beaufort states 0 through 5 (elimination of Beaufort 6 data discussed below). Rates were calculated for these schools detected in the entire study area and for schools stratified by area, species, individual Beaufort numbers, calm and rough sea conditions, good and poor sun conditions, individual observers, and observer teams.

RESULTS

Data describing each leg of searching effort during the entire survey are summarized in Table 2. Information summarized for each marine mammal sighting encountered during the survey is presented in Table 3. The geographic positions of all schools detected during the survey are presented for each species category (code) in Figures 6 through 19. Observer estimates of school size are presented by species codes in Table 4.

During the entire survey, observers searched 13,390 km and detected 513 marine mammal sightings (Table 5). Dolphins were detected in 314 schools and whales were detected in 217 schools (18 schools contained both dolphins and whales). These included 12 species of dolphins and 16 species of whales.

While operating in the searching mode in the study area

(Figure 1), observers searched 12,454 km and detected 282 dolphin schools. Searching effort was conducted during Beauforts 0 through 6 conditions, although because Beaufort 6 seas were very rough, data collected during these conditions were omitted from further analysis. During Beauforts 0 through 5, 12,349 km were searched and 281 dolphin schools were detected. The rate of detecting schools in the study area was 22.76 schools/1000 km searched (Table 6).

The McArthur's searching effort was distributed among all four strata (Table 6). In the northern area, detection rates increased with increased distance from shore. The detection rates in the inshore and middle strata were similar (Table 6).

Sea conditions in the study area were very rough; only 10% of the searching effort was completed in calm seas (Table 6). However, 20% of all schools were detected during calm seas and the rate of detecting schools during calm seas was more than twice the rate detected during rough seas.

Poor visibility conditions occurred only during 11% of the surveying effort during which 14% of the schools were detected (Table 6). Contrary to expectations, the rate of detecting schools during good conditions was lower than the rate during poor conditions.

The percent of schools detected by individual observers ranged from 1 to 16% (Table 6). Consequently, rates of detecting target schools also varied greatly (range of 1.53 to 12.27 schools/1000 km).

The percent of schools detected by teams ranged from 14 to 32% (Table 6). The rate of detecting schools by teams ranged from 14.78 to 26.12 schools/1000 km searched.

SUMMARY

In this report, we have presented data on dolphin encounter rates, school size, and species composition which meet the primary objectives of the cruise aboard the McArthur. Data on effort and sightings have been summarized. We found that the rate of encountering dolphin schools was higher during calm seas than during rough seas, and the rate during good visibility conditions was lower than the rate during poor visibility conditions. Rates were highest in the west area. Encounter rates among observers were variable.

ACKNOWLEDGMENTS

Because of the work of many dedicated professionals, the cruise aboard the McArthur was successfully executed. Among those contributing to the success of the cruise were the observers who spent many hours collecting the data, the officers and crew of the McArthur who gave their continuous support, and L. Farrar (Jordan Port Captain) who provided liaison with ship support personnel and the scientists. Critical logistical arrangements were completed by S. Sexton. William Irwin provided essential assistance with logistical preparations. Special efforts were provided in procurement by B. Engstrand and B. Watkins. Part of the manuscript was typed by C. Ratcliffe. Finally, we are grateful to I. Barrett, J. Carr, D. DeMaster, and B. Remington for their support during the entire cruise preparation and execution.

LITERATURE CITED

Bowditch, N. 1966. American practical navigator, an epitome of navigation. U. S. Naval Oceanographic Office. H. O. Pub. No. 9. Washington, DC. 1524 pp.

Holt, R. S. 1987. Estimating density of dolphin schools in the eastern tropical Pacific ocean by line transect methods. Fish. Bull. U.S. 85(3):419-434.

Holt, R. S. and S. N. Sexton. 1989. Report of a marine mammal survey of eastern tropical Pacific aboard the research vessel David Starr Jordan July 28 - December 6, 1988. NOAA-TM-NMFS-SWFC-129. 130 pp.

Lierheimer, L. J., P. C. Fiedler, S. B. Reilly, R. L. Pitman, L. B. Ballance and D. W. Behringer. 1989. Report of ecosystem studies conducted during the 1988 eastern tropical Pacific dolphin survey on the research vessel McArthur. NOAA-TM-NMFS-SWFC (in press).

Smith, T. D. 1982. Testing methods of estimating range and bearing to cetaceans aboard the R/V D. S. Jordan. NOAA-TM-NMFS-SWFC-20, 20 pp.

Table 1. Sea state conditions measured by the Beaufort scale (from Bowditch, 1966).

Wind force (Beaufort)	Knots	Descriptive	Sea Conditions	Probable wave height in ft.
0	0- 1	Calm	Sea smooth and mirror-like	-
1	1- 3	Light air	Scale-like ripple without foam crests	1/4
2	4- 6	Light breeze	Small short wavelets; crests have a glassy appearance and do not break	1/2
3	7-10	Gentle breeze	Large wavelets; some crests begin to break; foam of glassy appearance. Occasional white foam crests	2
4	11-16	Moderate breeze	Small waves, becoming longer; fairly frequent white foam crests	4
5	17-21	Fresh breeze	Moderate waves, taking a more pronounced long form; many white foam crests; there may be some spray	6
6	22-27	Strong breeze	Large waves begin to form; white foam crests are more extensive everywhere; there may be some spray	10

Table 2. Daily searching effort recorded in the eastern tropical Pacific aboard the McArthur during July 28 through December 6, 1988.

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
01	01	880730	19.45	51	38	68			2	163	28 14 n	121 41 w	8.75
01	02	880730	19.45	68	51	38			2	163			5.51
01	03	880730	19.45	68	51	38			2	175			1.30
01	04	880730	19.45	05	70	22			2	190			9.07
01	05	880730	19.45	05	70	51			2	190			0.65
01	06	880730	19.45	05	70	22			2	190			3.57
01	07	880730	19.45	70	22	05			2	190			0.97
01	08	880730	19.45	70	22	05			2	163	27 59 n	121 39 w	12.96
01	09	880730	19.45	22	05	70			2	163			3.89
01	10	880730	19.45	22	05	70			1	163			5.83
02	01	880730	19.45	22	05	70			1	163	27 47 n	121 35 w	2.59
02	02	880730	19.45	38	68	51			1	163			6.16
03	01	880730	19.45	51	38	68			2	163			9.40
03	02	880730	19.45	51	38	68			1	163			5.19
03	03	880730	19.45	68	51	38			1	163	27 35 n	121 35 w	15.56
03	04	880730	19.45	05	70	22			1	163			12.32
03	05	880730	19.45	70	22	05	12	12	1	163			4.21
04	01	880730	19.45	70	22	05	12	01	1	163	27 15 n	121 29 w	8.10
05	01	880730	19.45	51	38	68	03	01	1	163	27 03 n	121 23 w	9.40
05	02	880730	19.45	68	51	38	03	01	1	163			0.65
06	01	880730	19.45	22	05	70	03	02	2	163	26 51 n	121 18 w	12.96
06	02	880730	19.45	05	70	22			2	163			10.37
06	03	880730	19.45	05	70	22			1	163			2.27
06	04	880730	19.45	68	38	51			1	163			15.56
06	05	880730	19.45	51	68	38			1	163			0.65
07	01	880730	19.45	51	68	38			0	163	26 29 n	121 11 w	2.92
08	01	880730	19.45	51	68	38			0	163	26 26 n	121 10 w	8.43
08	02	880730	19.45	38	51	68			0	163			7.45
09	01	880730	19.45	22	70	05			0	163	26 16 n	121 07 w	2.27
09	02	880730	19.45	05	70	51			0	163			3.57
09	03	880730	19.45	05	70	51			0	163	26 13 n	121 06 w	0.32
01	01	880731	19.45	22	05	70			1	163	24 37 n	120 34 w	7.45
02	01	880731	19.45	38	68	51			1	163	24 33 n	120 31 w	7.45
03	01	880731	18.15	51	38	68			1	163	24 28 n	120 29 w	6.05
03	02	880731	19.45	68	51	38			1	163			8.10
04	01	880731	19.08	05	70	22			1	163	24 20 n	120 28 w	9.86
04	02	880731	19.08	70	22	05	10	01	1	163			13.03
04	03	880731	19.08	22	05	70	10	01	1	163			7.63
04	04	880731	19.08	68	51	38	11	01	1	163			4.13
04	05	880731	19.26	68	51	38			1	163	24 02 n	120 21 w	8.67
04	06	880731	18.89	38	68	51			2	163			12.59
04	07	880731	18.52	51	38	68			3	163	23 53 n	120 18 w	12.96
04	08	880731	19.26	05	70	22			2	163			6.10
04	09	880731	19.26	05	70	22			3	163	23 41 n	120 14 w	0.32
05	01	880731	19.26	05	70	22			3	163	23 39 n	120 11 w	4.49
05	02	880731	18.89	68	51	38			3	163			12.59

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
05	03	880731	18.89	38	68	51			3	163			10.07
05	04	880731	18.89	51	38	68			3	163	23 25 n	120 05 w	10.39
05	05	880731	18.89	70	05				3	163			2.20
05	06	880731	18.89	70	05	22			3	163			11.65
05	07	880731	18.52	05	22	70	04	02	3	163			4.94
06	01	880731	18.52	05	22	70			3	163	23 10 n	120 00 w	7.10
06	02	880731	19.08	22	70	05			3	163			8.58
07	01	880731	18.71	22	70	05			3	163	23 01 n	119 57 w	2.49
07	02	880731	18.71	22	70	05			3	163			0.31
01	01	880801	18.89	38	68	51			4	163	21 30 n	119 27 w	4.72
01	02	880801	18.89	38	68	51	09	03	4	163			8.50
01	03	880801	18.52	05	22	70			4	163			12.66
01	04	880801	18.52	22	70	05			5	163	21 16 n	119 23 w	12.96
01	05	880801	18.52	70	05	22	09	02	5	163			9.88
01	06	880801	18.52	70	05	22			5	163			4.94
01	07	880801	18.52	70	05	22	10	02	5	163			0.62
01	08	880801	18.52	51	38	68			5	163	21 01 n	119 18 w	13.89
01	09	880801	18.52	68	51	38			5	163			13.89
01	10	880801	18.52	38	68	51			5	163	20 47 n	119 13 w	8.64
01	11	880801	18.52	38	68	51			4	163	20 41 n	119 12 w	2.16
02	01	880801	18.71	05	22	70			5	163	20 39 n	119 10 w	13.41
02	02	880801	18.71	22	70	05			5	163			12.47
02	03	880801	18.71	70	05	22			5	163			9.66
02	04	880801	19.26	68	51	38			4	163			12.84
02	05	880801	18.71	38	68	51			4	163	20 12 n	119 02 w	12.47
02	06	880801	18.71	51	38	68			4	163			13.09
02	07	880801	18.89	05	22	70			4	163			5.04
03	01	880801	18.89	05	22	70			4	163	19 56 n	118 57 w	5.98
03	02	880801	18.89	22	70	05			4	163			12.59
03	03	880801	18.89	70	05	22			4	163			6.93
04	01	880801	18.89	38	68	51			4	163	19 42 n	118 57 w	0.63
04	02	880801	15.74	38	68	51			4	163			1.31
04	03	880801	18.89	38	68	51			4	163			3.15
04	04	880801	18.89	51	38	68			4	163			7.24
04	05	880801	18.89	68	51	38			4	163			1.26
05	01	880801	18.89	68	51	38			4	163	19 34 n	118 54 w	0.94
05	02	880801	18.89	68	51	38			4	163			0.31
01	01	880802	18.89	22	70	05			4	163	17 58 n	118 21 w	12.28
01	02	880802	18.89	68	51	38			4	163			11.33
01	03	880802	18.89	68	51	38			4	160	17 46 n	118 16 w	1.26
02	01	880802	18.89	38	68	51			4	160	17 44 n	118 15 w	7.56
02	02	880802	18.89	38	68	51			4	210	17 40 n	118 14 w	3.15
02	03	880802	18.89	51	38	68			4	210	17 38 n	118 15 w	12.91
02	04	880802	18.89	22	05	70			4	210			13.22
02	05	880802	18.89	05	70	22			4	210			13.85
02	06	880802	18.89	70	22	05			4	210	17 20 n	118 25 w	13.85
02	07	880802	18.89	38	68	51	08	01	4	210			12.28
02	08	880802	18.89	51	38	68	08	01	4	210			12.59
02	09	880802	18.89	68	51	38	12	12	5	210	17 01 n	118 34 w	12.91
02	10	880802	18.89	22	05	70	02	01	5	210			13.54
02	11	880802	18.89	05	70	22	02	01	5	210	16 47 n	118 43 w	11.65
02	12	880802	18.52	70	22	05	02	01	5	210			12.04

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
02	13	880802	18.52	51	38	68	02	01	5	210			10.80
02	14	880802	18.52	68	51	38	02	02	5	210			10.80
02	15	880802	18.52	38	68	51	02	02	5	210			12.04
02	16	880802	18.52	22	05	70			5	210			12.66
02	17	880802	18.52	05	70	22	03	02	5	210			2.78
02	18	880802	18.52	05	70	22	03	03	5	210	16 09 n	119 04 w	10.19
02	19	880802	18.52	70	22	05	03	03	5	210			7.72
02	20	880802	18.52	70	22	05			5	210	16 59 n	119 09 w	0.31
01	01	880803	18.89	51	38	68			3	210	14 47 n	119 50 w	11.02
01	02	880803	18.89	70	22	05			3	210			3.46
01	03	880803	18.89	70	22	05			4	113	14 40 n	119 53 w	8.19
01	04	880803	18.89	22	05	70			4	113	14 37 n	119 48 w	5.67
01	05	880803	18.89	22	05	70	11	02	4	113			7.24
01	06	880803	18.89	05	70	22	11	02	4	113			16.37
01	07	880803	18.89	68	51	38	11	02	4	113	14 31 n	119 33 w	14.17
01	08	880803	18.89	38	68	51	11	01	4	113			3.46
01	09	880803	18.89	38	68	51			4	113	14 26 n	119 24 w	3.15
01	10	880803	18.89	38	68	51	11	01	4	113			4.41
01	11	880803	18.89	38	68	51			4	113			3.15
01	12	880803	18.89	51	38	68			4	113	14 24 n	119 18 w	2.52
02	01	880803	18.52	51	38	68	11	01	4	113	14 22 n	119 14 w	6.17
02	02	880803	18.52	70	22	05	11	01	3	113			12.96
02	03	880803	18.52	22	05	70	11	12	3	113	14 18 n	119 04 w	1.23
03	01	880803	18.52	22	05	70	12	12	3	113	14 16 n	119 03 w	4.63
03	02	880803	18.52	05	70	22	12	12	3	113			11.11
03	03	880803	18.52	68	51	38	12	12	3	113	14 12 n	118 54 w	13.89
03	04	880803	18.52	38	68	51	06	01	3	113	14 09 n	118 48 w	10.80
03	05	880803	18.52	51	38	68			3	113	14 07 n	118 43 w	12.66
03	06	880803	18.52	70	22	05			3	113			12.66
03	07	880803	18.52	22	05	70			3	113	14 01 n	118 29 w	12.04
03	08	880803	18.52	05	70	22			3	113			7.41
03	09	880803	18.52	51	38	68			3	113	13 58 n	118 19 w	5.86
04	01	880803	18.52	68	51	38			3	113	13 56 n	118 13 w	5.56
05	01	880803	18.52	68	51	38			3	135	13 55 n	118 10 w	0.31
06	01	880803	18.52	68	51	38			3	135			0.31
06	02	880803	18.52	68	51	38			3	135	13 53 n	118 04 w	0.31
01	01	880804	18.52	05	70	22	10	03	4	142	13 21 n	117 27 w	6.17
01	02	880804	18.52	05	70	22	10	03	5	142	13 18 n	117 25 w	4.94
01	03	880804	18.52	68	51	38	10	03	5	142			13.89
01	04	880804	18.52	38	68	51	10	03	5	142	13 09 n	117 19 w	11.42
01	05	880804	18.52	38	68	51	10	03	4	142			3.09
01	06	880804	18.52	51	38	68	10	02	4	142			7.10
01	07	880804	18.52	51	38	68	10	02	5	142			6.79
01	08	880804	18.52	70	22	05	10	02	5	142	12 57 n	117 10 w	5.86
01	09	880804	18.52	70	22	05	10	02	5	142			2.78
02	01	880804	18.52	22	05	70			4	142	12 51 n	117 05 w	1.85
02	02	880804	18.52	22	05	70	10	01	4	142			10.80
02	03	880804	18.52	05	70	22	10	01	4	142	12 43 n	117 04 w	9.57
02	04	880804	18.52	05	70	22	10	01	5	142			5.86
02	05	880804	18.52	38	68	51	10	01	5	142			11.42
02	06	880804	18.52	38	68	51	10	12	5	142			0.93
02	07	880804	18.52	51	38	68	10	12	5	142			12.35

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
02	08	880804	18.71	68	51	38	12	12	5	142	12 28 n	116 52 w	12.47
02	09	880804	18.71	70	22	05	05	12	5	142			12.78
02	10	880804	18.71	22	05	70	05	01	5	142	12 16 n	116 43 w	12.47
02	11	880804	18.71	05	70	22	05	01	5	142	12 12 n	116 40 w	12.16
02	12	880804	18.71	51	38	68	05	02	5	142			12.47
02	13	880804	18.71	68	51	38	05	02	4	142			9.98
02	14	880804	18.71	38	68	51	05	02	4	142	11 57 n	116 26 w	10.29
02	15	880804	18.52	70	22	05	05	02	4	142	11 54 n	116 23 w	12.35
02	16	880804	18.52	22	05	70	05	02	3	142			6.17
03	01	880804	18.52	05	70	22			3	118	11 47 n	116 15 w	5.86
04	01	880804	18.52	05	70	22			3	118	11 46 n	116 11 w	0.31
01	01	880805	18.89	68	51	38			2	116	11 16 n	115 17 w	4.41
01	02	880805	18.71	68	51	38			2	116	11 15 n	115 15 w	4.68
01	03	880805	18.71	22	70	05			2	116			11.22
01	04	880805	18.71	70	05	22			2	116			15.28
01	05	880805	18.71	05	22	70			2	116			7.48
01	06	880805	18.71	05	22	70			2	116	11 05 n	114 55 w	0.31
01	01	880807	18.52	38	68	51			5	149	06 45 n	110 03 w	12.35
01	02	880807	18.52	38	68	51			5	149			1.54
01	03	880807	18.52	70	05	22			6	149			3.70
02	01	880807	18.52	70	05	22			6	149	06 35 n	109 57 w	4.94
02	02	880807	18.52	05	22	70			5	149	06 33 n	109 56 w	12.04
03	01	880807	18.52	51	38	68	05	01	6	149	05 46 n	109 25 w	12.35
03	02	880807	18.52	68	51	38	05	01	5	149	05 41 n	109 21 w	12.35
03	03	880807	18.52	38	68	51	05	01	5	149	05 37 n	109 18 w	12.35
03	04	880807	18.52	70	22	05	05	02	5	149			14.20
03	05	880807	18.52	22	05	70	05	02	5	149	05 24 n	109 10 w	9.26
03	06	880807	18.52	05	70	22	05	02	5	149	05 20 n	109 08 w	8.95
03	07	880807	18.52	51	38	68	05	03	5	149	05 16 n	109 05 w	9.57
03	08	880807	18.52	68	51	38	05	03	5	149	05 12 n	109 02 w	1.85
04	01	880807	18.52	68	51	38			4	149	05 09 n	109 02 w	4.32
04	02	880807	18.52	68	51	38			4	149	05 07 n	109 01 w	0.31
01	01	880808	18.52	05	70	22			2	292	04 38 n	109 04 w	9.57
01	02	880808	18.52	70	22	05	05	03	3	292			9.26
01	03	880808	18.52	38	68	51	05	02	3	292			5.86
02	01	880808	18.52	51	38	68			3	301	04 38 n	109 21 w	3.40
03	01	880808	18.52	22	05	70			3	292	04 48 n	109 28 w	11.11
03	02	880808	18.52	05	70	22	04	01	3	292			10.80
03	03	880808	18.52	70	22	05	04	01	3	292			6.17
03	04	880808	18.52	70	22	05			3	289	04 55 n	109 43 w	2.16
04	01	880808	18.52	51	68	38			3	289	04 57 n	109 44 w	5.56
04	02	880808	18.52	51	68	38			3	285	04 59 n	109 47 w	4.94
04	03	880808	18.52	38	51	68			3	285	04 59 n	109 49 w	4.01
04	04	880808	18.52	38	51	68	12	12	3	285			6.79
04	05	880808	18.52	68	38	51			3	285	05 01 n	109 50 w	8.03
05	01	880808	18.52	51	38	68	12	02	3	287	05 03 n	110 00 w	7.72
05	02	880808	18.52	51	38	68	01	02	3	257	05 05 n	110 05 w	1.85
05	03	880808	18.52	68	51	38	01	02	3	257			9.26
05	04	880808	18.52	38	68	51			3	257	05 04 n	110 10 w	8.64
05	05	880808	18.52	70	22	05	01	03	3	257	05 02 n	110 15 w	7.72
05	06	880808	18.52	22	05	70	01	03	3	257	05 01 n	110 20 w	0.93
06	01	880808	18.52	22	05	70			3	257	05 01 n	110 26 w	0.00

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
01	01	880809	18.52	68	38	51			3	290	05 13 n	111 24 w	16.98
01	02	880809	18.52	05	70	22			3	290			13.89
01	03	880809	18.52	70	22	05	05	02	3	290			13.58
01	04	880809	18.52	22	05	70	05	02	3	290			14.51
02	01	880809	18.52	51	38	68			3	290	05 21 n	112 01 w	2.78
03	01	880809	18.52	68	51	38	04	01	3	290	05 27 n	112 06 w	12.04
03	02	880809	18.52	05	70	22	04	01	3	290			6.48
03	03	880809	18.52	05	70	22	12	12	3	290			5.86
03	04	880809	18.52	70	22	05	12	12	3	290			11.11
03	05	880809	18.52	70	22	05	12	12	3	296	05 32 n	112 24 w	1.23
03	06	880809	18.52	22	05	70	01	01	3	296			12.04
03	07	880809	18.52	38	68	51	12	01	3	296			3.70
03	08	880809	18.52	38	68	51	12	01	4	296			5.86
04	01	880809	18.52	38	68	51	12	01	4	296	05 38 n	112 36 w	1.54
04	02	880809	18.52	51	38	68	12	01	4	296			11.73
04	03	880809	18.52	68	51	38	12	01	4	296			8.03
05	01	880809	18.52	68	51	38	12	01	3	296	05 42 n	112 47 w	2.47
05	02	880809	18.52	05	70	22			3	296			8.64
05	03	880809	18.52	70	22	05	12	02	3	296			7.41
05	04	880809	18.52	22	05	70			3	296			3.70
05	05	880809	18.52	22	05	70	12	02	3	296			3.09
06	01	880809	18.52	51	38	68	12	03	3	296	05 53 n	113 02 w	6.79
06	02	880809	18.52	68	51	38			3	296	05 55 n	113 06 w	8.03
06	03	880809	18.52	38	68	51			3	296			4.94
06	04	880809	18.52	38	68	51			3	296	05 57 n	113 12 w	0.31
01	01	880810	18.52	38	68	51			5	289	06 17 n	114 31 w	8.64
01	02	880810	18.52	38	68	51	05	02	5	289			2.47
01	03	880810	18.52	51	38	68			5	289	06 18 n	114 38 w	9.26
02	01	880810	18.52	22	70	05	05	01	5	289	06 25 n	114 50 w	9.26
02	02	880810	18.52	70	05	22	05	01	5	289			9.57
02	03	880810	18.52	05	22	70	05	01	5	289			1.23
02	04	880810	18.52	05	22	70			5	289			7.72
02	05	880810	18.52	68	38	51			5	289	06 29 n	115 06 w	1.23
03	01	880810	18.52	68	38	51			5	289	06 30 n	115 08 w	4.63
04	01	880810	18.52	51	68	38			5	289	06 31 n	115 12 w	7.10
04	02	880810	18.52	51	68	38	12	12	5	289	06 32 n	115 16 w	1.54
05	01	880810	18.52	38	51	68			5	295	06 31 n	115 20 w	2.16
05	02	880810	18.52	70	16	22			5	295			12.04
05	03	880810	18.52	16	22	70	12	01	4	295	06 34 n	115 27 w	3.40
06	01	880810	18.52	16	22	70	12	01	4	295	06 35 n	115 27 w	6.17
06	02	880810	18.52	22	70	16	12	01	4	295	06 37 n	115 29 w	11.73
06	03	880810	18.52	68	51	38	12	01	4	295			4.01
06	04	880810	18.52	68	51	38	11	01	4	330	06 41 n	115 36 w	6.48
07	01	880810	18.52	38	68	51	11	02	5	330	06 45 n	115 37 w	20.37
07	02	880810	18.52	70	16	22	10	02	5	330	06 54 n	115 41 w	8.95
08	01	880810	18.52	16	22	70			5	330	07 05 n	115 49 w	3.09
08	02	880810	18.52	16	22	70			5	330	07 07 n	115 50 w	0.31
01	01	880811	20.37	68	51	38			3	286	07 14 n	116 53 w	3.40
01	02	880811	20.37	22	70	05			3	286			14.60
01	03	880811	20.37	70	05	22			3	286	07 16 n	117 02 w	11.20
01	04	880811	20.37	70	05	22	05	02	4	286			4.41
01	05	880811	19.45	05	22	70	05	02	4	286			14.26

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
01	06	880811	19.45	38	68	51	05	02	4	286	07 22 n	117 14 w	7.78
01	07	880811	19.45	38	68	51	05	01	3	286			6.16
01	08	880811	19.45	38	68	51	05	01	4	286			0.65
01	09	880811	19.45	51	38	68	05	01	4	286			11.34
01	10	880811	19.45	51	38	68			5	286			3.24
01	11	880811	18.52	68	51	38	05	01	5	286	07 27 n	117 28 w	13.89
01	12	880811	18.52	22	70	05	12	12	5	286			8.64
01	13	880811	18.52	22	70	05	12	12	5	283	07 31 n	117 40 w	4.01
01	14	880811	18.52	70	05	22	12	12	5	283			12.66
01	15	880811	18.52	05	22	70	12	01	5	283			11.73
01	16	880811	18.52	68	38	51	01	01	5	283			12.35
01	17	880811	18.52	51	68	38	12	01	5	283			6.48
02	01	880811	18.52	51	38	68	12	01	5	283	07 39 n	118 07 w	8.03
02	02	880811	18.52	22	70	05	12	01	5	283			10.80
02	03	880811	18.52	70	05	22	12	02	5	283			3.70
02	04	880811	18.52	70	05	22	11	02	5	313	07 43 n	118 19 w	2.16
03	01	880811	18.52	05	22	70	11	02	5	313	07 47 n	118 23 w	8.03
03	02	880811	18.52	51	68	38	11	03	5	313			10.80
03	03	880811	18.52	38	51	68	11	03	5	313			11.73
03	04	880811	18.52	68	38	51	11	03	5	313			6.79
03	05	880811	18.52	68	38	51			5	313			1.85
03	06	880811	18.52	68	38	51			5	313	08 03 n	118 39 w	0.31
01	01	880812	18.52	70	22	05			5	286	08 18 n	119 37 w	3.40
01	02	880812	18.52	70	22	05			5	300			3.09
01	03	880812	18.52	51	38	68	05	03	5	300			13.89
01	04	880812	18.52	68	51	38	05	03	5	300	08 26 n	119 45 w	13.89
01	05	880812	18.52	38	68	51	05	03	5	300			14.20
01	06	880812	18.52	22	05	70	05	02	5	300	08 31 n	119 53 w	3.40
01	07	880812	18.52	22	05	70			5	300			10.80
01	08	880812	18.52	05	70	22	05	01	5	300			10.80
01	09	880812	18.52	05	70	22	05	01	6	300			2.47
01	10	880812	18.52	70	22	05	05	01	6	300	08 45 n	120 08 w	3.09
01	11	880812	18.52	05	22	05	05	01	6	300			1.23
01	12	880812	18.52	05	22	05	05	01	6	300	08 46 n	120 10 w	0.31
01	01	880813	18.52	38	68	51			5	300	09 37 n	121 59 w	3.70
02	01	880813	18.52	22	70	05			5	300	09 42 n	122 08 w	9.26
02	02	880813	18.52	70	05	22	05	02	5	300			9.88
02	03	880813	18.52	05	22	70	05	02	5	300			6.17
02	04	880813	18.52	68	51	38	05	02	5	300	09 49 n	122 19 w	13.89
02	05	880813	18.52	38	68	51	05	01	5	300			10.80
02	06	880813	18.52	38	68	51			5	300			3.09
02	07	880813	18.52	51	38	68			5	300	09 56 n	122 32 w	4.94
03	01	880813	18.52	22	70	05			5	300	10 06 n	122 35 w	10.80
03	02	880813	18.52	70	05	22			5	300			3.70
04	01	880813	18.52	70	05	22			5	300	10 09 n	122 42 w	1.85
04	02	880813	18.52	05	22	70	12	12	5	300			6.48
04	03	880813	18.52	05	22	70			5	300			2.78
05	01	880813	18.52	51	38	68			5	300	10 13 n	122 49 w	9.88
05	02	880813	18.52	68	51	38			5	300			12.35
05	03	880813	18.52	38	68	51			5	300			12.04
05	04	880813	18.52	22	70	05			5	300			7.41
05	05	880813	18.52	22	70	05			5	300			0.62

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
06	01	880813	18.52	22	70	05			5	300	10 24 n	123 10 w	1.23
06	02	880813	18.52	70	05	22			5	300			4.94
06	03	880813	18.52	70	05	22			5	300			5.56
06	04	880813	18.52	05	22	70			5	300			4.94
06	05	880813	18.52	05	22	70			5	300	10 29 n	123 17 w	0.31
01	01	880814	18.52	38	51	68			5	300	10 56 n	124 16 w	13.58
01	02	880814	18.52	68	38	51			5	300	10 59 n	124 22 w	9.88
01	03	880814	18.52	68	38	51			5	265	11 02 n	124 27 w	1.85
01	04	880814	18.52	68	38	51	05	02	5	290			2.78
01	05	880814	18.52	51	68	38			5	290			3.70
01	06	880814	18.52	51	68	38			5	302	11 03 n	124 31 w	9.26
01	07	880814	18.52	70	22	05	05	02	5	302	11 05 n	124 35 w	5.56
01	08	880814	18.52	70	22	05	05	02	5	302			1.23
01	09	880814	18.52	70	22	05			5	260			2.47
01	10	880814	18.52	70	22	05			5	302	11 07 n	124 39 w	4.94
01	11	880814	18.52	22	05	70			5	302			23.15
01	12	880814	18.52	05	70	22			5	302	11 12 n	124 53 w	1.85
01	01	880815	18.52	68	51	38	05	03	4	299	12 22 n	126 24 w	7.72
02	01	880815	18.52	22	70	05	05	03	4	299	12 25 n	126 31 w	13.89
02	02	880815	18.52	70	05	22	05	02	4	299	12 28 n	126 37 w	1.85
02	03	880815	18.52	70	05	22			4	299			4.94
02	04	880815	18.52	70	05	22	05	02	4	299	12 30 n	126 41 w	6.48
02	05	880815	18.52	05	22	70			4	299			9.26
02	06	880815	18.52	05	22	70	05	02	4	299			4.01
02	07	880815	18.52	38	68	51	05	01	4	299	12 36 n	126 51 w	13.89
02	08	880815	18.52	51	38	68	05	01	4	299			7.72
02	09	880815	18.52	51	38	68			5	299			2.16
02	10	880815	18.52	51	38	68			5	324	12 42 n	126 00 w	1.85
02	11	880815	18.52	51	38	68	05	01	5	299			2.16
02	12	880815	18.52	68	51	38	05	01	6	299	12 43 n	127 03 w	13.89
03	01	880815	18.52	22	70	05			3	299	12 59 n	127 32 w	6.79
03	02	880815	18.52	68	51	38	11	01	3	299			12.35
03	03	880815	18.52	38	68	51	11	01	3	299			12.35
03	04	880815	18.52	51	38	68	11	01	3	299			7.72
03	05	880815	18.52	51	38	68	11	02	4	299	13 05 n	127 43 w	3.40
04	01	880815	18.52	22	05	70	11	02	4	299	13 07 n	127 44 w	2.78
04	02	880815	18.52	22	05	70	11	02	4	330			7.72
04	03	880815	18.52	05	70	22	10	02	4	330			9.88
04	04	880815	18.52	70	22	05	10	02	4	330	13 16 n	127 51 w	8.64
05	01	880815	18.52	51	38	68	11	03	4	330			8.03
05	02	880815	18.52	51	38	68	11	03	4	330	13 27 n	127 53 w	0.31
01	01	880816	18.52	05	22	70			3	245	13 35 n	128 59 w	5.86
01	02	880816	18.52	22	70	05	06	03	3	245			5.25
01	03	880816	18.52	70	05	22	07	03	3	245	13 31 n	129 06 w	4.32
01	04	880816	18.52	38	68	51	07	03	3	245			9.26
01	05	880816	18.52	38	68	51			3	245			4.63
01	06	880816	18.52	51	38	68			3	245	13 27 n	129 16 w	3.09
01	07	880816	18.52	51	38	68			2	245			10.80
01	08	880816	18.52	68	51	38			1	245			0.62
02	01	880816	18.52	22	70	05			1	245	13 16 n	129 33 w	1.54
03	01	880816	18.52	22	70	05			2	245	13 11 n	129 42 w	7.10
03	02	880816	18.52	70	05	22			2	245	13 10 n	129 46 w	3.40

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
03	03	880816	18.52	70	05	22			2	245			3.70
03	04	880816	18.52	05	22	70			2	245			1.85
03	05	880816	18.52	05	22	70	07	01	2	245	13 08 n	129 51 w	4.94
03	06	880816	18.52	38	68	51			2	245			11.42
03	07	880816	18.52	51	38	68			2	245			4.63
03	08	880816	18.52	51	38	68			2	245			8.64
03	09	880816	18.52	68	51	38			2	245			7.10
04	01	880816	18.52	68	51	38			2	245	12 57 n	130 15 w	1.23
04	02	880816	18.52	22	70	05			2	245			2.47
05	01	880816	18.52	70	05	22			2	245	12 56 n	130 25 w	1.85
06	01	880816	18.52	05	22	70			2	245	12 55 n	130 29 w	4.32
07	01	880816	18.52	05	22	70	01	01	2	245	12 53 n	130 32 w	0.93
08	01	880816	18.52	05	22	70	01	01	2	245	12 52 n	130 33 w	0.93
09	01	880816	18.52	51	38	68			2	330	12 48 n	130 36 w	4.01
10	01	880816	18.52	68	51	38			2	330	12 52 n	130 39 w	6.48
10	02	880816	18.52	38	68	51			2	330			6.48
10	03	880816	18.52	22	70	05	10	02	2	330	12 58 n	130 44 w	9.26
10	04	880816	18.52	70	05	22	10	02	2	330	13 03 n	130 46 w	5.56
10	05	880816	18.52	70	05	22	10	03	2	330			3.70
10	06	880816	18.52	05	22	70			2	330	13 07 n	130 51 w	0.31
11	01	880816	18.52	05	22	70			2	336	13 08 n	130 54 w	0.31
01	01	880817	18.52	68	38	51			3	226	13 36 n	131 40 w	1.54
02	01	880817	18.52	22	70	05			3	226	13 33 n	131 52 w	6.17
02	02	880817	18.52	22	70	05			4	175			3.40
02	03	880817	18.52	70	05	22			4	175			1.85
03	01	880817	18.52	70	05	22	09	02	5	175	13 27 n	131 56 w	3.70
03	02	880817	18.52	05	22	70	09	02	5	175			7.72
03	03	880817	18.52	05	22	70	09	02	5	223	13 20 n	131 55 w	1.54
03	04	880817	18.52	51	68	38	08	02	5	190			12.96
03	05	880817	18.52	38	51	68			5	190			15.12
03	06	880817	18.52	68	38	51	07	01	5	250			1.85
03	07	880817	18.52	68	38	51	06	01	5	260			10.80
03	08	880817	18.52	22	70	05	06	01	5	260			12.96
03	09	880817	18.52	70	05	22	12	12	5	260			1.23
03	10	880817	18.52	70	05	22	12	12	5	190			9.57
04	01	880817	18.52	05	22	70	12	12	5	190	12 57 n	132 19 w	11.11
04	02	880817	18.52	05	22	70	12	12	5	190			0.93
04	03	880817	18.52	51	38	68	12	12	5	190			4.63
04	04	880817	18.52	51	38	68	12	01	5	260	12 48 n	132 21 w	7.72
04	05	880817	18.52	68	51	38	12	01	5	260			0.31
05	01	880817	18.52	68	51	38	12	01	5	260			1.85
05	02	880817	18.52	68	51	38	02	01	5	190	12 46 n	132 31 w	6.79
05	03	880817	18.52	38	68	51	03	01	5	190			7.10
05	04	880817	18.52	22	70	05	03	01	5	190			5.25
05	05	880817	18.52	22	70	05	01	02	4	260			0.93
05	06	880817	18.52	22	70	05	01	02	4	240	12 35 n	132 34 w	3.09
05	07	880817	18.52	22	70	05			3	240			1.54
05	08	880817	18.52	70	05	22			3	240			10.80
06	01	880817	18.52	51	68	38			3	255	12 33 n	132 49 w	8.64
06	02	880817	18.52	38	51	68			3	255			7.72
06	03	880817	18.52	68	38	51			2	255			9.57
06	04	880817	18.52	68	38	51			2	255	12 23 n	133 00 w	0.31

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
01	01	880818	18.52	22	70	05			2	224	11 37 n	133 47 w	6.48
02	01	880818	18.52	68	51	38			1	250	11 33 n	133 54 w	0.31
03	01	880818	18.52	38	68	51	07	02	1	220	11 27 n	134 02 w	6.48
03	02	880818	18.52	51	38	68	07	02	2	220			6.79
03	03	880818	18.52	70	05	22	08	02	2	220	11 22 n	134 07 w	3.70
04	01	880818	18.52	05	22	70	08	01	3	220			10.19
04	02	880818	18.52	22	70	05	08	01	3	220	11 21 n	134 16 w	10.19
04	03	880818	18.52	51	38	68	08	01	3	220			3.09
05	01	880818	18.52	68	51	38			3	220	11 16 n	134 27 w	11.73
05	02	880818	18.52	38	68	51	12	12	3	220			2.78
05	03	880818	18.52	38	68	51	12	12	3	220			5.86
05	04	880818	18.52	38	68	51	12	12	3	220			1.85
06	01	880818	18.52	70	05	22	12	12	3	220	11 06 n	134 37 w	8.03
06	02	880818	18.52	70	05	22	12	12	1	220			4.32
06	03	880818	18.52	05	22	70	02	01	2	220			3.09
07	01	880818	18.52	05	22	70	02	01	2	220	10 59 n	134 44 w	4.94
07	02	880818	18.52	22	70	05	02	01	2	220			3.40
08	01	880818	18.52	38	68	51	02	02	2	220	10 50 n	134 53 w	8.33
08	02	880818	18.52	51	38	68	02	02	3	220			6.79
08	03	880818	18.52	51	38	68	02	02	3	220			2.47
08	04	880818	18.52	68	51	38			4	220	10 42 n	134 59 w	3.70
08	05	880818	18.52	68	51	38	02	02	4	220			1.54
09	01	880818	18.52	70	05	22	02	02	4	220	10 37 n	135 03 w	2.47
10	01	880818	18.52	70	05	22	02	03	5	220	10 35 n	135 05 w	5.25
01	01	880820	18.52	51	38	68			6	291			7.10
01	02	880820	18.52	51	38	68			6	291			20.06
01	01	880821	18.52	70	22	05			3	300	12 05 n	142 10 w	10.19
01	02	880821	18.52	38	68	51			3	300			12.04
02	01	880821	18.52	51	38	68			3	300	12 12 n	142 22 w	9.26
03	01	880821	16.67	51	68	38			3	201	12 22 n	142 33 w	1.39
01	01	880822	18.52	22	70	05			5	340	11 18 n	143 13 w	9.26
01	02	880822	18.52	51	38	68			6	340			4.01
02	01	880822	18.52	51	38	68			3	340	11 39 n	143 21 w	6.17
02	02	880822	18.52	70	22	05			3	340	11 42 n	143 22 w	12.96
02	03	880822	18.52	22	05	70			3	340			7.10
02	04	880822	18.52	22	05	70			2	340			8.95
02	05	880822	18.52	05	70	22			2	340	11 55 n	143 28 w	8.03
02	06	880822	18.52	05	70	22			1	340			4.63
02	07	880822	18.52	68	51	38			1	340			12.35
02	08	880822	18.52	38	68	51			1	340			12.35
02	09	880822	18.52	51	38	68			2	340			12.35
02	10	880822	18.52	70	22	05	10	01	2	340			11.11
03	01	880822	18.52	22	05	70	10	01	2	340	12 27 n	143 42 w	10.80
03	02	880822	18.52	05	70	22	10	01	2	340			12.04
03	03	880822	18.52	38	68	51	10	02	2	340			10.80
03	04	880822	18.52	51	38	68			2	340			7.72
04	01	880822	18.52	68	51	38			3	340	12 52 n	143 54 w	0.93
05	01	880822	18.52	70	22	05			3	340	12 53 n	143 56 w	4.01
05	02	880822	18.52	70	22	05			4	340			1.23
05	03	880822	18.52	70	22	05			4	340	12 55 n	143 57 w	0.31
01	01	880823	18.52	38	68	51			2	301	14 07 n	145 43 w	11.42
01	02	880823	18.52	38	68	51	05	03	3	301			4.01

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
01	03	880823	18.52	70	05	22			3	301			7.41
01	04	880823	18.52	70	05	22	05	02	3	301			6.48
01	05	880823	18.52	05	22	70	05	02	3	301	14 15 n	145 59 w	8.95
01	06	880823	18.52	05	22	70	05	02	3	301			4.63
01	07	880823	18.52	22	70	05			3	301			13.89
01	08	880823	18.52	68	51	38			3	301			13.89
01	09	880823	18.52	38	68	51			3	301	14 27 n	146 15 w	13.89
01	10	880823	18.52	51	38	68	05	01	3	301	14 32 n	146 27 w	7.72
01	11	880823	18.52	51	38	68	05	01	4	301			6.17
01	12	880823	18.52	70	05	22	06	01	4	301			4.01
01	13	880823	18.52	70	05	22	12	12	4	301	14 38 n	146 37 w	9.26
01	14	880823	18.52	05	22	70	12	12	4	301			12.96
01	15	880823	18.52	22	70	05	12	12	4	301			10.80
02	01	880823	18.52	68	51	38	11	01	5	301	14 52 n	147 00 w	11.73
02	02	880823	18.52	38	68	51			5	301			8.03
03	01	880823	18.52	70	05	22			5	301			7.41
03	02	880823	18.52	05	22	70			5	301			8.33
03	03	880823	18.52	22	70	05	11	02	5	301	15 06 n	147 24 w	3.40
03	04	880823	18.52	68	51	38	11	02	5	301			8.03
03	05	880823	18.52	68	51	38			4	301			2.78
03	06	880823	18.52	38	68	51			4	301			10.80
03	07	880823	18.52	51	38	68	11	03	4	301			6.17
03	08	880823	18.52	51	38	68			4	301			3.70
03	09	880823	18.52	51	38	68			4	301	15 18 n	147 42 w	0.31
01	01	880824	16.67	05	70	22			3	303	16 19 n	149 25 w	5.83
01	02	880824	16.48	38	68	51	05	03	4	303			6.59
01	03	880824	17.59	38	68	51			4	303			5.86
01	04	880824	17.59	51	38	68	05	02	4	303	16 24 n	149 34 w	2.93
01	05	880824	17.59	51	38	68	05	02	4	310			10.26
01	06	880824	17.59	68	51	38	05	02	4	310			13.20
01	07	880824	17.59	70	22	05	05	02	4	310	16 33 n	149 46 w	13.49
01	08	880824	17.59	22	05	70	05	02	4	310			13.49
01	09	880824	17.59	05	70	22	05	01	4	310	16 42 n	149 59 w	1.47
01	10	880824	17.59	05	70	22	05	01	4	307			2.64
01	11	880824	17.59	05	70	22			4	307			1.17
02	01	880824	17.59	51	38	68			4	307	16 47 n	150 05 w	10.26
02	02	880824	17.59	68	51	38			4	307	16 50 n	150 10 w	2.64
02	03	880824	17.59	68	51	38			4	303			7.92
02	04	880824	17.59	38	68	51			4	303			11.73
02	05	880824	17.59	70	22	05			5	303			11.73
02	06	880824	17.59	22	05	70			5	303			3.52
03	01	880824	17.59	22	05	70			5	303	17 03 n	150 29 w	4.98
04	01	880824	17.22	38	68	51			2	303	17 10 n	150 39 w	6.03
04	02	880824	17.22	38	68	51			3	303			1.15
04	03	880824	17.22	51	38	68			3	303	17 13 n	150 43 w	6.60
05	01	880824	17.22	70	05	22			3	303			10.62
05	02	880824	17.22	05	22	70			3	303			11.20
05	03	880824	17.22	22	70	05			3	303			6.60
05	04	880824	17.22	22	70	05			3	303	17 27 n	151 06 w	0.29
01	01	880902	18.52	05	70	22			5	142	15 20 n	151 39 w	2.78
01	02	880902	18.52	05	70	22	10	03	5	142			4.94
01	03	880902	18.52	70	22	05	10	03	5	142			7.41

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	observer codes right	observer codes rec.	sun position horz.	sun position vert.	beauf. no.	course (deg.)	position latitude	position longitude	km in leg
01	04	880902	18.52	22	05	70			5	142			8.03
01	05	880902	18.52	38	68	51			5	142			9.88
01	06	880902	18.52	38	68	51	10	02	5	142			4.01
01	07	880902	18.52	51	38	68	10	02	5	142	15 04 n	151 28 w	13.89
01	08	880902	18.52	68	51	38	10	02	5	142			9.26
01	09	880902	18.52	68	51	38			5	142			4.63
01	10	880902	18.52	05	70	22			5	130	14 52 n	151 20 w	13.89
01	11	880902	18.52	70	22	05			5	130			14.20
01	12	880902	18.52	22	05	70			5	130	14 43 n	151 10 w	1.85
01	13	880902	18.52	22	05	70	12	01	5	130			11.73
01	14	880902	18.52	38	68	51	12	12	5	130			4.32
01	15	880902	18.52	38	68	51	12	12	6	130	14 37 n	151 04 w	6.48
01	16	880902	18.52	51	38	68	12	12	6	130			13.89
01	17	880902	18.52	68	51	38	12	12	6	130			9.88
02	01	880902	18.52	68	51	38	05	02	5	130	14 11 n	150 38 w	8.03
02	02	880902	18.52	38	68	51	05	02	5	130			7.72
02	03	880902	18.52	51	38	68			5	130			7.72
02	04	880902	18.52	70	05	22			5	130			2.78
02	05	880902	18.52	70	05	22			4	130			3.70
02	06	880902	18.52	05	22	70	05	03	4	130			6.17
02	07	880902	18.52	22	70	05	05	03	4	130			4.32
02	08	880902	18.52	22	70	05			4	130	13 57 n	150 21 w	0.31
01	01	880903	18.52	51	38	68			4	150	12 28 n	149 00 w	3.40
02	01	880903	18.52	51	38	68			5	150	12 24 n	149 00 w	3.70
02	02	880903	18.52	68	51	38			5	150	12 18 n	148 54 w	4.94
02	03	880903	18.52	68	51	38			5	150	12 18 n	148 54 w	4.01
02	04	880903	18.52	38	68	51			5	150	12 18 n	148 54 w	3.40
02	05	880903	18.52	38	68	51			4	150	12 18 n	148 54 w	4.32
02	06	880903	18.52	70	22	05			5	150			7.72
02	07	880903	18.52	70	22	05			4	150			6.17
02	08	880903	18.52	22	05	70			4	150	12 10 n	148 48 w	6.17
02	09	880903	18.52	22	05	70	10	02	4	150			8.03
02	10	880903	18.52	05	70	22	10	02	4	150			4.01
02	11	880903	18.52	05	70	22	10	01	4	150	12 01 n	148 43 w	9.26
02	12	880903	18.52	68	51	38	11	01	5	150			13.89
02	13	880903	18.52	38	68	51	11	01	4	150			13.89
02	14	880903	18.52	51	38	68			4	142	11 43 n	148 32 w	6.17
02	15	880903	18.52	51	38	68			4	142			3.40
03	01	880903	18.52	05	70	22			4	142	11 29 n	148 22 w	3.70
04	01	880903	18.52	05	70	22			4	142	11 24 n	148 18 w	1.23
05	01	880903	18.52	51	38	68			5	142	11 19 n	148 14 w	8.33
05	02	880903	18.52	68	38	99			5	142			2.78
05	03	880903	18.52	68	51	38	04	02	4	142			4.94
05	04	880903	18.52	68	38	51			4	142	11 12 n	148 09 w	5.25
06	01	880903	18.52	38	68	51			3	142	10 55 n	148 01 w	6.79
01	01	880904	18.52	22	70	05	10	03	6	137	10 08 n	147 12 w	9.26
01	02	880904	18.52	70	05	22	10	03	4	137			2.78
02	01	880904	18.52	38	68	51	10	03	3	137	10 01 n	147 00 w	2.78
03	01	880904	18.52	38	68	51			3	137	09 56 n	146 55 w	0.31
04	01	880904	18.52	51	38	68	11	01	3	137	09 49 n	146 51 w	9.26
04	02	880904	18.52	22	05	70	11	01	3	137			3.70
04	03	880904	18.52	22	05	70	11	01	2	137			10.49

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
04	04	880904	18.52	05	70	22	11	01	2	137			13.58
04	05	880904	18.52	70	22	05	11	01	2	137	09 34 n	146 37 w	13.89
04	06	880904	18.52	51	38	68	12	12	2	137			12.35
04	07	880904	18.52	68	51	38	12	12	3	137			12.35
04	08	880904	18.52	38	68	51	04	01	3	137			4.63
04	09	880904	18.52	38	68	51	04	01	2	137			8.95
04	10	880904	18.52	22	05	70			2	137			6.17
04	11	880904	18.52	22	05	70	04	01	2	137			4.94
04	12	880904	18.52	05	70	22	04	01	2	137			5.25
04	13	880904	18.52	05	70	22	04	01	2	137			5.56
05	01	880904	18.52	70	22	05	04	02	2	137	09 01 n	146 09 w	7.10
05	02	880904	18.52	38	68	51	04	02	2	137			2.78
05	03	880904	18.52	38	68	51	04	02	3	137			4.94
05	04	880904	18.52	51	38	68	04	02	2	137			6.79
06	01	880904	18.52	05	22	70			2	137	08 49 n	145 51 w	2.16
06	02	880904	18.52	05	22	70			2	137	08 48 n	145 50 w	0.31
01	01	880905	18.52	05	70	22			5	116	07 20 n	144 01 w	8.64
02	01	880905	18.52	70	22	05			5	116	07 17 n	143 54 w	12.04
02	02	880905	18.52	22	05	70			5	116			9.26
02	03	880905	18.52	68	51	38	05	01	5	116			4.01
02	04	880905	18.52	68	51	38	05	01	5	123	07 12 n	143 42 w	4.32
03	01	880905	18.52	38	68	51			5	123	07 07 n	143 34 w	9.88
03	02	880905	18.52	51	38	68			5	123			7.10
04	01	880905	18.52	05	70	22			5	123	07 03 n	143 25 w	7.41
04	02	880905	18.52	70	22	05	05	02	5	123			8.64
04	03	880905	18.52	22	05	70	05	02	4	123			8.03
04	04	880905	18.52	38	68	51			4	123			7.72
04	05	880905	18.52	38	68	51			4	123	06 54 n	143 09 w	0.31
01	01	880906	18.52	05	70	22			3	123	06 08 n	141 38 w	1.85
01	02	880906	18.52	05	70	22	11	03	3	123			2.78
01	03	880906	18.52	05	70	22	11	03	3	123			0.93
01	04	880906	18.52	70	22	05	11	03	3	123			4.63
01	05	880906	18.52	70	22	05			3	123			0.62
01	06	880906	18.52	22	05	70			3	123			2.47
02	01	880906	18.52	51	38	68	11	02	5	123			4.32
02	02	880906	18.52	51	38	68			5	123	06 02 n	141 27 w	1.85
03	01	880906	18.52	68	51	38			4	123	05 59 n	141 21 w	1.85
04	01	880906	18.52	68	51	38	11	02	4	123	05 57 n	141 22 w	3.40
04	02	880906	18.52	68	51	38	11	02	4	123			0.93
04	03	880906	18.52	38	68	51	11	02	5	123			12.66
04	04	880906	18.52	05	70	22			5	123			6.48
04	05	880906	18.52	05	70	22	11	01	6	123			2.78
01	01	880907	18.52	51	38	68	12	03	6	087	04 53 n	138 27 w	1.85
01	02	880907	18.52	51	38	68	11	03	6	117			8.95
01	03	880907	18.52	68	51	38	11	03	6	117			7.10
01	04	880907	18.52	68	51	38	11	03	6	117	04 49 n	138 20 w	0.31
01	01	880908	19.45	38	68	51	06	02	5	091	05 07 n	133 25 w	8.43
01	02	880908	19.45	51	38	68	06	02	5	091			8.10
01	03	880908	18.52	68	51	38	06	03	5	091			6.17
01	04	880908	18.52	22	70	05			5	091	05 07 n	133 12 w	3.09
01	01	880909	18.52	68	38	51			4	074	05 29 n	131 43 w	1.85
01	02	880909	18.52	68	38	51	12	03	4	074			8.64

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
01	03	880909	18.52	51	68	38	12	03	4	074			6.48
01	04	880909	18.52	51	68	38	12	03	5	074			3.09
01	05	880909	18.52	38	51	68	01	03	5	074			10.80
01	06	880909	18.52	70	22	05	01	02	5	074			1.85
01	07	880909	18.52	70	22	05	11	02	5	115	05 34 n	131 26 w	7.72
02	01	880909	18.52	70	22	05	11	02	5	115	05 33 n	131 21 w	1.54
02	02	880909	18.52	22	05	70	11	02	5	115			8.95
02	03	880909	18.52	22	05	70	02	02	5	046			4.63
02	04	880909	18.52	05	70	22	02	02	5	046			4.63
02	05	880909	18.52	05	70	22	02	01	5	046	05 34 n	131 13 w	9.26
02	06	880909	18.52	38	51	68	01	01	5	046			14.20
02	07	880909	18.52	68	38	51	02	01	5	046			10.19
02	08	880909	18.52	68	38	51	02	12	4	046			4.32
02	09	880909	18.52	51	68	38	12	12	4	046			14.51
03	01	880909	18.52	70	22	05	12	12	4	046	05 57 n	130 50 w	12.35
03	02	880909	18.52	22	05	70	12	12	3	046			12.04
03	03	880909	14.82	22	05	70	07	01	3	046			0.74
03	04	880909	13.89	05	70	22	07	01	3	046			0.93
03	05	880909	15.74	05	70	22	07	01	3	046			6.56
03	06	880909	15.74	38	68	51	07	01	3	046			10.49
03	07	880909	18.52	51	38	68	08	02	3	046			9.88
04	01	880909	18.52	51	38	68	08	02	3	046	06 17 n	130 29 w	1.54
04	02	880909	18.52	68	51	38	08	02	3	046			11.73
05	01	880909	18.52	22	70	05	08	03	3	046			5.25
05	02	880909	18.52	70	05	22	08	03	3	046	06 34 n	130 18 w	4.63
05	03	880909	18.52	38	68	51	08	03	3	046			8.03
05	04	880909	18.52	38	68	51	08	03	3	046	06 39 n	130 11 w	0.31
01	01	880910	18.52	22	70	05	02	03	1	046	07 43 n	128 55 w	10.80
01	02	880910	18.52	70	05	22	02	03	1	046			3.40
02	01	880910	18.52	70	05	22	01	02	1	046	07 53 n	128 48 w	2.78
02	02	880910	18.52	70	05	22	01	02	1	035			1.23
02	03	880910	18.52	38	68	51	11	02	1	122			13.58
02	04	880910	18.52	51	38	68	11	02	1	122			13.89
03	01	880910	18.52	68	51	38	11	01	1	122	07 47 n	128 28 w	0.62
04	01	880910	18.52	68	51	38	11	01	1	122	07 45 n	128 26 w	3.70
05	01	880910	18.52	22	70	05	11	01	1	132	07 43 n	128 27 w	3.40
06	01	880910	18.52	70	05	22	11	01	1	132	07 41 n	128 17 w	5.56
06	02	880910	18.52	70	05	22	12	12	1	132			4.32
07	01	880910	18.52	05	22	70	12	12	1	132	07 35 n	128 11 w	12.35
07	02	880910	18.52	51	68	38	12	12	1	132			0.62
08	01	880910	18.52	38	51	68	04	01	1	132	07 26 n	127 59 w	6.48
09	01	880910	18.52	22	70	05			1	132	07 19 n	127 51 w	0.62
10	01	880910	18.52	22	70	05			1	132	07 16 n	127 49 w	3.09
11	01	880910	18.52	51	68	38			2	132	06 57 n	127 29 w	6.48
11	02	880910	18.52	38	68	51			2	132			4.63
11	03	880910	18.52	70	05	22			2	132			4.32
11	04	880910	18.52	70	05	22			2	132	06 51 n	127 22 w	0.31
01	01	880911	18.52	38	68	51			4	132	05 48 n	126 08 w	2.47
01	02	880911	18.52	38	68	51	11	03	4	132			2.78
01	03	880911	18.52	51	38	68	11	03	4	132			7.10
01	04	880911	18.52	68	51	38	11	03	5	132	05 43 n	126 02 w	5.56
01	05	880911	18.52	70	22	05	11	02	5	132			14.20

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	observer codes right	observer codes rec.	sun position horz.	sun position vert.	beauf. no.	course (deg.)	position latitude	position longitude	km in leg
01	06	880911	18.52	22	05	70	11	02	5	132			4.32
01	07	880911	18.52	22	05	70			5	132			0.93
01	08	880911	18.52	22	05	70			5	132	05 35 n	125 51 w	0.31
01	01	880912	18.52	70	22	05	12	12	5	128	02 57 n	123 10 w	5.25
01	02	880912	18.52	22	05	70	12	12	5	128			2.47
01	03	880912	18.52	51	38	68	12	12	5	128			12.35
01	04	880912	18.52	68	51	38	12	12	5	128			12.35
01	05	880912	18.52	38	68	51	05	02	5	128	02 50 n	123 01 w	13.58
01	06	880912	18.52	22	70	05	05	02	5	128			3.40
01	07	880912	18.52	22	70	05	06	01	5	086	02 46 n	122 55 w	7.72
01	08	880912	18.52	70	05	22	06	01	5	086			12.35
01	09	880912	18.52	05	22	70	06	01	5	086			12.96
01	10	880912	18.52	38	68	51	06	02	5	100			8.95
01	11	880912	18.52	51	68	38	06	02	5	100			8.95
01	12	880912	18.52	38	51	68	06	02	5	100			9.26
01	13	880912	18.52	22	70	05	06	03	5	100			6.79
01	14	880912	18.52	70	05	22			5	100			7.10
01	15	880912	18.52	70	05	22			5	100	02 47 n	122 17 w	0.31
01	01	880913	12.96	38	68	51			5	105	03 00 n	121 13 w	5.83
01	02	880913	12.96	51	38	68			5	105			6.48
01	03	880913	12.96	68	51	38			5	105			4.32
01	01	880914	18.52	22	70	05			5	085	04 13 n	118 39 w	4.94
02	01	880914	18.52	22	70	05			5	085	04 13 n	118 36 w	4.01
02	02	880914	18.52	70	05	22			5	085			9.26
02	03	880914	18.52	05	22	70			5	085			7.10
02	04	880914	18.52	51	38	68			5	085			12.35
02	05	880914	18.52	51	38	68			5	085			1.54
02	06	880914	18.52	68	51	38			5	085	04 14 n	118 24 w	3.09
02	07	880914	18.52	68	51	38			5	085			0.31
03	01	880914	18.52	38	68	51			5	085	04 17 n	118 15 w	7.10
03	02	880914	18.52	22	70	05			5	085	04 17 n	118 12 w	5.86
03	03	880914	18.52	22	70	05			5	085			8.03
03	04	880914	18.52	70	05	22			5	085			9.26
03	05	880914	18.52	70	05	22			5	085			4.94
03	06	880914	18.52	05	22	70			5	085	04 18 n	117 58 w	6.79
03	07	880914	18.52	05	22	70			5	085			6.79
03	08	880914	18.52	38	68	51			5	085			12.35
04	01	880914	18.52	51	38	68			5	085	04 22 n	117 42 w	10.49
04	02	880914	18.52	22	70	05			5	085			3.40
04	03	880914	18.52	22	70	05			5	085			9.57
04	04	880914	18.52	70	05	22			5	085			12.35
04	05	880914	18.52	05	22	70			5	085			11.73
04	06	880914	18.52	68	51	38			6	085			10.19
04	07	880914	18.52	38	68	51	06	02	6	085			9.88
04	08	880914	18.52	51	38	68	06	03	6	085			8.03
04	09	880914	18.52	22	70	05			5	085			5.86
04	10	880914	18.52	22	70	05			5	085	04 23 n	117 05 w	0.31
01	01	880915	14.82	51	68	38	12	03	5	091	04 36 n	115 44 w	2.47
01	02	880915	14.82	51	68	38	11	03	5	110			4.94
01	03	880915	14.82	38	51	68	11	03	5	110			3.46
02	01	880915	14.82	38	51	68	11	03	5	110	04 34 n	115 39 w	2.96
02	02	880915	14.82	68	38	51	11	03	5	110			6.67

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
02	03	880915	14.82	70	22	05	11	02	5	110			11.11
02	04	880915	14.82	22	05	70	11	02	5	110	04 34 n	115 30 w	11.85
02	05	880915	14.82	05	70	22			5	110			2.22
02	06	880915	14.82	05	70	22	12	01	5	110			1.73
03	01	880915	14.82	68	38	51	12	01	5	085	04 36 n	115 18 w	10.62
03	02	880915	14.82	51	68	38	12	01	5	085			8.40
03	03	880915	14.82	51	68	38	12	12	5	095			0.99
03	04	880915	14.82	38	51	68	12	12	5	095			9.14
03	05	880915	14.82	70	22	05	12	12	5	095			10.62
03	06	880915	18.52	22	05	70	12	12	5	095			0.62
03	07	880915	14.82	22	05	70	12	12	5	095	04 40 n	115 00 w	1.73
03	08	880915	18.52	22	05	70	12	12	5	095			7.72
04	01	880915	18.52	05	70	22			5	095			9.57
04	02	880915	18.52	68	51	38	06	01	5	095			12.35
04	03	880915	18.52	38	68	51	06	01	5	095			10.19
04	04	880915	18.52	38	68	51	05	02	5	110	04 40 n	114 38 w	3.09
04	05	880915	18.52	51	38	68			5	090			11.42
04	06	880915	18.52	70	22	05			5	090			9.88
04	07	880915	18.52	22	05	70			5	090			9.57
04	08	880915	18.52	05	70	22			4	090			8.64
01	09	880915	18.52	68	38	51			4	090	04 40 n	114 16 w	3.09
01	01	880916	18.52	22	70	05			4	093	04 51 n	112 47 w	1.85
01	02	880916	18.52	22	70	05			4	180			3.70
01	03	880916	18.52	70	05	22			4	180			3.40
02	01	880916	18.52	51	38	68	12	02	4	090	04 47 n	112 44 w	5.25
03	01	880916	18.52	51	38	68	12	02	4	090			5.86
03	02	880916	18.52	68	51	38	12	02	4	090	04 47 n	112 47 w	13.27
04	01	880916	18.52	38	68	51			4	090	04 47 n	112 28 w	7.41
05	01	880916	18.52	05	22	70			4	086	04 53 n	112 25 w	5.25
05	02	880916	18.52	05	22	70			4	090			3.70
05	03	880916	18.52	22	70	05			4	090			9.57
05	04	880916	18.52	70	05	22			4	090			8.95
05	05	880916	18.52	38	68	51			4	090			12.04
05	06	880916	18.52	51	38	68			4	090			12.35
05	07	880916	18.52	68	51	38			4	090			6.17
05	08	880916	18.52	68	51	38			4	090			6.17
06	01	880916	18.52	05	22	70			4	090	04 53 n	111 49 w	5.86
07	01	880916	18.52	22	70	05			4	090	04 57 n	111 38 w	8.33
07	02	880916	18.52	70	05	22			4	090			2.47
08	01	880916	18.52	38	51	68			5	090	04 57 n	111 25 w	8.33
08	02	880916	18.52	68	38	51			5	090			7.72
08	03	880916	18.52	51	68	38			5	090			4.01
08	04	880916	18.52	05	22	70			5	090			6.48
08	05	880916	18.52	22	70	05			5	090			6.79
08	06	880916	18.52	70	05	22			5	090	04 57 n	111 07 w	3.70
01	01	880918	18.52	22	70	05			5	101	04 22 n	106 58 w	9.26
02	01	880918	18.52	70	05	22			5	101	04 21 n	106 53 w	3.40
03	01	880918	18.52	68	38	51			5	101	04 20 n	106 47 w	5.25
03	02	880918	18.52	68	38	51			5	101			7.41
04	01	880918	18.52	51	68	38			5	101	04 18 n	106 38 w	9.26
04	02	880918	18.52	38	51	68			5	101			9.26
04	03	880918	18.52	05	22	70			5	101	04 16 n	106 29 w	13.89

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
04	04	880918	18.52	22	70	05			5	101			14.20
04	05	880918	18.52	70	05	22			5	101	04 14 n	106 14 w	13.58
04	06	880918	18.52	51	68	38			5	101			12.35
04	07	880918	18.52	38	51	68			5	101			3.70
04	08	880918	18.52	38	51	65			5	106			8.64
04	09	880918	18.52	68	38	51			5	106			12.66
04	10	880918	18.52	70	22	51			5	106			12.35
04	11	880918	18.52	22	70	05			5	106			7.72
01	01	880919	18.52	51	38	68			5	100	03 40 n	103 34 w	0.31
02	01	880919	18.52	68	51	38			5	102	03 42 n	103 26 w	5.25
02	02	880919	18.52	68	51	38	12	02	6	102			1.23
03	01	880919	18.52	05	70	22			5	102	03 31 n	102 38 w	8.33
03	02	880919	18.52	70	22	05			5	089			8.03
03	03	880919	18.52	22	05	70			5	089			1.85
03	04	880919	18.52	22	05	70			5	069	03 30 n	102 29 w	2.47
03	05	880919	18.52	22	05	70			5	089			3.09
03	06	880919	18.52	38	68	51			4	089			4.94
04	01	880919	18.52	51	38	68			4	089	03 36 n	102 15 w	3.09
04	02	880919	18.52	05	70	22			4	089			8.95
04	03	880919	18.52	05	70	22			4	089			0.93
04	04	880919	18.52	70	22	05			5	089			9.26
04	05	880919	18.52	22	05	70			5	089			8.64
04	06	880919	18.52	68	38	51			5	089			9.26
04	07	880919	18.52	68	38	51			5	089	03 36 n	101 53 w	0.31
01	01	880920	18.52	05	70	22			4	090	03 35 n	100 16 w	5.25
01	02	880920	18.52	05	70	22			5	090			3.40
01	03	880920	18.52	70	22	05			5	090			0.93
02	01	880920	18.52	70	22	05			5	090	03 35 n	100 07 w	1.85
02	02	880920	18.52	22	05	70			5	090			6.48
02	03	880920	18.52	68	51	38			5	090			4.63
02	04	880920	18.52	68	51	38			5	090	03 35 n	100 00 w	11.11
02	05	880920	18.52	38	68	51			5	090			12.04
02	06	880920	18.52	51	38	68			5	090			13.89
01	01	880923	18.52	68	38	51	10	01	3	148	00 04 n	093 03 w	8.33
02	01	880923	18.52	51	68	38	12	12	3	148	00 00 s	093 01 w	9.88
02	02	880923	18.52	05	70	22	12	12	3	148			5.86
03	01	880923	18.52	05	70	22	12	12	3	148	00 06 s	092 57 w	0.31
04	01	880923	18.52	70	22	05	12	12	3	148	00 09 s	092 58 w	0.62
05	01	880923	18.52	70	22	05	12	12	3	148	00 13 s	092 57 w	2.16
05	02	880923	18.52	22	05	70	12	12	3	148			5.56
06	01	880923	18.52	22	05	70	12	12	3	148	00 17 s	092 55 w	2.47
06	02	880923	18.52	51	38	68	04	01	3	148			8.33
07	01	880923	18.52	51	38	68	04	01	3	148	00 25 s	092 49 w	2.78
07	02	880923	18.52	68	51	38	04	01	4	148			9.57
07	03	880923	18.52	38	68	51	04	02	4	148			8.33
07	04	880923	18.52	05	70	22	04	02	4	148			6.48
07	05	880923	18.52	70	22	05	04	02	4	148			5.86
07	06	880923	18.52	22	05	70	04	02	4	148			3.40
08	01	880923	18.52	38	51	68	04	03	5	148	00 45 s	092 36 w	5.56
01	01	880926	18.52	22	70	05			3	095	01 05 s	088 46 w	4.94
01	02	880926	18.52	22	70	05	01	03	4	065			4.32
01	03	880926	18.52	70	05	22	01	03	4	065			3.09

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
01	04	880926	18.52	70	05	22			4	065			1.54
02	01	880926	18.52	05	22	70			4	065	01 01 s	088 36 w	1.54
03	01	880926	18.52	51	38	68	01	02	4	065	01 00 s	088 33 w	0.62
04	01	880926	18.52	68	51	38	01	02	4	065	00 58 s	088 29 w	6.48
04	02	880926	18.52	68	51	38			4	065			7.10
04	03	880926	18.52	68	51	38	01	02	5	065			0.93
04	04	880926	18.52	38	68	51	01	02	5	065			3.40
04	05	880926	18.52	38	68	51			5	065			5.56
04	06	880926	18.52	38	68	51	01	01	5	065			4.94
04	07	880926	18.52	22	70	05	01	01	5	067	00 48 s	088 21 w	13.89
04	08	880926	18.52	70	05	22	01	01	5	067			6.17
04	09	880926	18.52	70	05	22			5	067			0.62
05	01	880926	18.52	05	22	70			5	067	00 41 s	088 09 w	4.32
06	01	880926	18.52	05	22	70			5	067	00 40 s	088 06 w	6.17
06	02	880926	18.52	51	68	38			5	067			12.35
06	03	880926	18.52	38	51	68			5	067			3.09
06	04	880926	18.52	38	51	68			5	078			10.19
06	05	880926	18.52	68	38	51			5	078			11.42
06	06	880926	18.52	22	70	05			5	078			12.66
06	07	880926	18.52	70	05	22			5	078			13.27
06	08	880926	18.52	05	22	70			5	078			11.11
06	09	880926	18.52	68	38	51			5	078			9.26
06	10	880926	18.52	51	68	38			5	078			9.26
06	11	880926	18.52	38	51	68			5	078			9.26
06	12	880926	18.52	22	70	05			5	078			5.56
06	13	880926	18.52	22	70	05			5	078	00 19 s	088 16 w	0.31
01	01	880927	18.52	68	51	38			5	078	00 16 n	085 40 w	10.80
02	01	880927	18.52	22	70	05			4	078	00 17 n	085 31 w	13.27
02	02	880927	18.52	70	05	22			4	078			12.66
02	03	880927	18.52	05	22	70			4	078			12.66
02	04	880927	18.52	68	38	51			4	078			13.27
02	05	880927	18.52	51	68	38			4	078			13.89
02	06	880927	18.52	38	51	68			4	078	00 31 n	085 01 w	13.89
02	07	880927	18.52	22	70	05			3	078			12.35
02	08	880927	18.52	70	05	22			3	078			12.35
02	09	880927	18.52	05	22	70			3	078			11.11
03	01	880927	18.52	51	68	38			3	078	00 42 n	084 28 w	8.33
03	02	880927	18.52	38	51	68			3	078			8.03
03	03	880927	18.52	68	38	51			3	078			8.03
03	04	880927	18.52	22	70	05			3	078			9.26
03	05	880927	18.52	70	05	22			3	078			9.57
03	06	880927	18.52	05	22	70			3	078			5.25
03	07	880927	18.52	05	22	70			3	066			3.70
03	08	880927	18.52	38	51	68			3	066			7.72
03	09	880927	18.52	68	38	51			3	066			0.93
04	01	880927	18.52	68	38	51			3	066	00 54 n	083 53 w	2.78
04	02	880927	18.52	51	68	38			3	066			5.25
04	03	880927	18.52	51	68	38			3	066	00 55 n	083 49 w	0.31
01	01	880928	18.52	22	70	05			3	023	02 05 n	082 26 w	3.70
02	01	880928	18.52	70	05	22			3	023	02 07 n	082 23 w	7.10
02	02	880928	18.52	38	68	51			4	023			4.01
02	03	880928	18.52	38	68	51	02	03	4	023			6.17

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
02	04	880928	18.52	38	68	51			4	023			1.23
03	01	880928	18.52	51	38	68			4	023	02 20 n	082 15 w	9.57
04	01	880928	18.52	68	51	38			4	023	02 24 n	082 14 w	6.48
04	02	880928	18.52	68	51	38	02	02	4	023			1.85
04	03	880928	18.52	68	51	38			4	023			1.54
04	04	880928	18.52	22	05	70			4	023	02 29 n	082 13 w	12.04
04	05	880928	18.52	22	05	70			4	023			1.54
04	06	880928	18.52	22	70	05			4	023			8.95
04	07	880928	18.52	22	70	05			4	033			4.94
04	08	880928	18.52	70	05	22			4	023	02 42 n	082 07 w	6.17
04	09	880928	18.52	70	05	22			4	023			2.47
04	10	880928	18.52	70	05	22			3	023			5.25
04	11	880928	18.52	68	51	38			3	023			6.48
04	12	880928	18.52	68	51	38			3	023			3.70
04	13	880928	18.52	68	51	38	12	12	3	023			2.47
04	14	880928	18.52	38	68	51	12	12	3	023			4.01
04	15	880928	18.52	38	68	51	12	12	4	023			8.03
04	16	880928	18.52	51	38	68			4	023			9.88
05	01	880928	18.52	05	22	70	08	01	4	023	03 13 n	081 54 w	10.49
05	02	880928	18.52	22	70	05			4	023			9.57
05	03	880928	18.52	20	05	22	08	02	4	023			9.88
05	04	880928	18.52	51	38	68	08	02	4	023			9.26
06	01	880928	18.52	68	51	38	08	02	4	023	03 35 n	081 43 w	6.79
06	02	880928	18.52	38	68	51	08	02	4	023			6.48
06	03	880928	18.52	05	22	70			4	010			4.94
06	04	880928	18.52	22	70	05	09	03	4	010			4.01
01	01	881005	18.52	64	69	31			4	191	05 19 n	080 05 w	4.01
01	02	881005	18.52	64	69	31	02	02	4	191	05 16 n	080 06 w	6.48
01	03	881005	18.52	69	31	64	02	03	4	191			1.54
02	01	881005	18.52	55	56	67	02	03	4	210	05 08 n	080 08 w	3.09
02	02	881005	18.52	55	56	67	02	03	4	191	05 07 n	080 09 w	1.23
02	03	881005	18.52	55	56	67			4	191			0.62
02	04	881005	18.52	55	56	67			4	191	05 05 n	080 09 w	0.31
01	01	881006	18.52	67	55	56			5	191	04 08 n	080 22 w	6.79
01	02	881006	18.52	67	55	56			5	191	04 04 n	080 23 w	3.70
01	03	881006	18.52	55	56	67			5	191	04 02 n	080 23 w	2.16
01	04	881006	18.52	55	56	67			5	191			7.41
01	05	881006	18.52	69	31	64			5	191			11.73
02	01	881006	18.52	31	64	69			5	191	03 45 n	080 26 w	5.56
02	02	881006	18.52	31	64	69	09	01	5	191	03 43 n	080 27 w	3.70
02	03	881006	18.52	64	69	31			5	191			3.40
02	04	881006	18.52	64	69	31	09	01	5	191			10.49
03	01	881006	17.59	69	31	64	02	02	4	199	02 27 n	080 40 w	7.92
03	02	881006	17.59	67	55	56	02	03	4	199			4.40
03	03	881006	17.59	67	55	56	02	03	4	199	02 21 n	080 41 w	4.40
03	04	881006	17.59	55	56	67	02	03	4	199			3.23
03	05	881006	17.59	55	56	67			4	199			5.57
03	06	881006	17.59	55	56	67			4	199	02 14 n	080 44 w	0.29
01	01	881007	18.52	31	64	69			3	328	01 28 n	081 00 w	0.93
02	01	881007	18.52	64	69	31			4	328	01 33 n	081 00 w	5.86
03	01	881007	18.52	69	31	64	04	02	4	328	01 36 n	081 02 w	2.16
03	02	881007	18.52	69	31	64			4	328			1.54

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
03	03	881007	18.52	56	67	55			4	328			12.35
03	04	881007	18.52	67	55	56			4	328			11.73
04	01	881007	18.52	55	56	67			4	328	01 50 n	081 09 w	3.09
04	02	881007	18.52	55	56	67	05	01	4	328			3.09
04	03	881007	18.52	31	64	69	05	01	4	328			4.01
04	04	881007	18.52	31	64	69			4	328			7.72
04	05	881007	18.52	31	64	69			4	315	01 58 n	081 14 w	0.93
04	06	881007	18.52	64	69	31			4	315			8.95
04	07	881007	18.52	64	69	31	06	01	4	315			3.70
04	08	881007	18.52	69	31	64			4	315			11.73
04	09	881007	18.52	56	67	55			4	315			6.17
04	10	881007	18.52	56	67	55			4	323			6.17
04	11	881007	18.52	67	55	56			4	323			2.78
05	01	881007	18.52	67	55	56			4	323	02 13 n	081 27 w	6.79
05	02	881007	18.52	55	56	67			4	323			12.35
05	03	881007	18.52	31	64	69			4	323			3.09
05	04	881007	18.52	31	64	69	09	01	4	323			7.72
05	05	881007	18.52	31	64	69	09	01	4	328	02 25 n	081 37 w	1.54
05	06	881007	18.52	64	69	31	09	01	4	328			5.25
06	01	881007	18.52	69	31	64	10	02	4	328	02 33 n	081 40 w	7.72
06	02	881007	18.52	56	67	55	10	02	4	328			9.26
06	03	881007	18.52	67	55	56			4	328			2.16
06	04	881007	18.52	67	55	56	10	02	4	328			7.10
06	05	881007	18.52	55	56	67	10	02	4	328	02 44 n	081 47 w	9.26
06	06	881007	18.52	31	64	69	10	03	4	328			13.89
01	01	881008	18.52	55	56	67			4	328	03 51 n	082 28 w	9.88
01	02	881008	18.52	56	67	55			4	328			4.01
02	01	881008	18.52	64	69	31			4	328	04 04 n	082 33 w	13.58
02	02	881008	18.52	69	31	64			4	328			6.17
02	03	881008	18.52	69	31	64	04	02	4	328	04 13 n	082 39 w	2.47
02	04	881008	18.52	69	31	64			4	328			2.47
02	05	881008	18.52	31	64	69			4	328			9.26
02	06	881008	18.52	31	64	69			5	328			3.09
02	07	881008	18.52	55	56	67			5	328	04 19 n	082 41 w	5.56
02	08	881008	18.52	55	56	67			5	328	04 22 n	082 43 w	0.62
03	01	881008	18.52	56	67	55			4	328	04 24 n	082 43 w	12.66
03	02	881008	18.52	67	55	56			5	328			12.35
03	03	881008	18.52	64	69	31			5	328	04 35 n	082 49 w	12.35
03	04	881008	18.52	69	31	64			5	328			6.48
03	05	881008	16.67	69	31	64			5	320	04 43 n	082 53 w	5.28
03	06	881008	16.67	31	64	69			5	320			11.11
03	07	881008	16.67	55	56	67			5	320	04 50 n	082 59 w	7.50
03	08	881008	16.67	55	56	67			5	320	04 53 n	083 02 w	3.61
03	09	881008	16.67	56	67	55			5	320			1.39
03	10	881008	16.67	56	67	55	10	01	5	320			1.94
03	11	881008	16.67	56	67	55			5	320			2.22
03	12	881008	16.67	56	67	55			5	273	04 57 n	083 05 w	5.56
03	13	881008	16.67	67	55	56			5	273			11.39
03	14	881008	16.67	64	69	31	11	02	4	273	04 56 n	083 14 w	8.06
03	15	881008	16.67	69	31	64	11	02	4	273	04 56 n	083 18 w	8.33
03	16	881008	16.67	31	64	69			4	273	04 56 n	083 23 w	2.22
04	01	881008	16.67	55	56	67			4	273	04 59 n	083 23 w	9.72

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
04	02	881008	16.67	55	56	67			4	273	04 59 n	083 28 w	0.28
01	01	881009	18.52	69	31	64			5	234	04 10 n	084 43 w	10.19
01	02	881009	18.52	31	64	69			5	234			4.01
02	01	881009	18.52	31	64	69			5	234	04 05 n	084 50 w	1.85
03	01	881009	18.52	64	69	31			5	234	04 02 n	084 52 w	4.63
03	02	881009	18.52	67	55	56			5	234	04 00 n	084 54 w	12.35
03	03	881009	18.52	55	56	67			5	234			6.17
03	04	881009	18.52	55	56	67			5	240	03 52 n	084 59 w	6.17
03	05	881009	18.52	56	67	55			5	240			12.35
03	06	881009	18.52	69	31	64			5	240	03 47 n	085 07 w	12.35
03	07	881009	18.52	31	64	69			5	240			5.56
03	08	881009	18.52	31	64	69	08	01	5	240			7.10
03	09	881009	18.52	64	69	31	08	01	5	240			3.70
03	10	881009	18.52	64	69	31			5	240			4.94
03	11	881009	18.52	64	69	31	09	12	5	240			3.40
03	12	881009	18.52	67	55	56	09	12	5	240	03 36 n	085 23 w	5.25
03	13	881009	18.52	67	55	56	12	12	5	348			7.10
03	14	881009	18.52	55	56	67			5	348			12.35
03	15	881009	18.52	56	67	55			5	348	03 45 n	085 28 w	0.93
04	01	881009	18.52	56	67	55	08	01	5	348	03 46 n	085 30 w	3.09
04	02	881009	18.52	69	31	64	09	01	4	348			12.35
04	03	881009	18.52	31	64	69	09	01	4	348			7.41
05	01	881009	18.52	64	69	31	09	01	4	348	04 02 n	085 32 w	7.72
05	02	881009	18.52	67	55	56	09	02	4	348			9.26
05	03	881009	18.52	55	56	67	09	02	4	348	04 11 n	085 34 w	6.79
06	01	881009	18.52	56	67	55	09	02	4	348	04 17 n	085 31 w	4.01
06	02	881009	18.52	56	67	55			4	348			1.85
06	03	881009	18.52	69	31	64	09	01	4	348			4.01
06	04	881009	18.52	69	31	64			4	348			5.25
06	05	881009	18.52	31	64	69	09	03	4	348	04 25 n	085 37 w	4.01
01	01	881010	16.67	56	67	55			4	351	05 53 n	085 53 w	7.50
01	02	881010	16.67	67	55	56			4	351			1.94
01	03	881010	16.67	67	55	56			4	351			6.11
01	04	881010	16.67	55	56	67			4	351			3.06
01	05	881010	16.67	55	56	67			4	351	06 06 n	085 55 w	4.17
01	06	881010	16.67	31	64	69			4	351	06 08 n	085 54 w	2.78
01	07	881010	16.67	31	64	69	03	02	4	351			4.17
01	08	881010	16.67	31	64	69			4	351			1.39
01	09	881010	16.67	31	64	69			4	351	06 13 n	085 55 w	3.06
01	10	881010	16.67	64	69	31			4	351			10.83
01	11	881010	16.67	69	31	64			4	351			4.17
01	12	881010	16.67	69	31	64			4	340	06 23 n	085 57 w	4.17
01	13	881010	16.67	69	31	64			4	340			2.78
01	14	881010	16.67	56	67	55			4	340	06 27 n	085 58 w	6.39
02	01	881010	18.52	67	55	56			4	340	06 42 n	086 03 w	8.64
03	01	881010	18.52	31	64	69	07	12	4	340	06 53 n	086 07 w	7.72
03	02	881010	18.52	31	64	69			4	340			7.72
03	03	881010	18.52	64	69	31	08	01	4	340			7.72
03	04	881010	18.52	56	67	55			4	340	07 06 n	086 10 w	2.78
03	05	881010	18.52	56	67	55			4	212	07 07 n	086 11 w	4.63
03	06	881010	18.52	56	67	55	01	01	4	212			3.09
03	07	881010	18.52	56	67	55			5	212	07 03 n	086 13 w	1.85

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
03	08	881010	18.52	67	55	56			5	212			6.17
03	09	881010	18.52	67	55	56			5	212	07 00 n	086 15 w	0.31
01	01	881013	18.52	64	69	31			3	239	01 57 n	090 51 w	6.17
01	02	881013	18.52	64	69	31			2	239			4.01
01	03	881013	18.52	69	31	64			2	239	01 54 n	090 56 w	1.23
02	01	881013	18.52	55	56	67			2	239	01 50 n	091 02 w	11.11
02	02	881013	18.52	56	67	55			2	239			0.93
02	03	881013	18.52	56	67	55			2	262	01 50 n	091 09 w	2.16
03	01	881013	18.52	56	67	55			2	255	01 49 n	091 11 w	5.56
03	02	881013	18.52	67	55	56			2	255			2.78
03	03	881013	18.52	67	55	56			3	255	01 48 n	091 16 w	2.78
04	01	881013	18.52	64	69	31			3	255	01 46 n	091 25 w	10.80
04	02	881013	18.52	69	31	64			3	259			9.26
04	03	881013	18.52	31	64	69			3	259			2.47
04	04	881013	18.52	31	64	69			3	265			6.79
04	05	881013	18.52	55	56	67			3	265	01 43 n	091 42 w	7.72
04	06	881013	18.52	55	56	67			4	265			4.63
04	07	881013	18.52	56	67	55			4	265			12.35
04	08	881013	18.52	67	55	56			4	265			2.47
05	01	881013	18.52	64	69	31			5	227	01 41 n	092 02 w	5.25
05	02	881013	18.52	64	69	31			4	227			1.85
05	03	881013	18.52	64	69	31			4	230			5.86
05	04	881013	18.52	69	31	64			4	230			10.80
05	05	881013	18.52	55	56	67	01	02	4	230	01 33 n	092 12 w	9.26
05	06	881013	18.52	56	67	55			4	230			9.26
05	07	881013	18.52	67	55	56			4	230			9.57
05	08	881013	18.52	64	69	31			4	230	01 24 n	092 24 w	6.79
01	01	881014	18.52	67	55	56			4	334	01 56 n	093 20 w	2.78
02	01	881014	18.52	69	31	64			4	334	02 10 n	093 28 w	6.79
03	01	881014	18.52	67	55	56	04	02	4	331	02 18 n	093 34 w	2.78
04	01	881014	18.52	67	55	56			4	331	02 21 n	093 35 w	2.78
05	01	881014	18.52	55	56	67			4	328	02 33 n	093 37 w	1.85
05	02	881014	18.52	55	56	67	05	01	5	328			3.09
05	03	881014	18.52	55	56	67	05	01	5	328			3.09
05	04	881014	18.52	69	31	64	05	01	5	328	02 37 n	093 39 w	6.17
05	05	881014	18.52	69	31	64	05	01	5	328			3.09
06	01	881014	18.52	31	64	69			5	328	02 42 n	093 43 w	1.54
07	01	881014	18.52	31	64	69			5	328	02 44 n	093 44 w	11.11
07	02	881014	18.52	64	69	31			5	328			2.78
08	01	881014	18.52	64	69	31			5	328	02 52 n	093 48 w	1.23
08	02	881014	18.52	67	55	56	09	01	5	328	02 53 n	093 49 w	8.95
08	03	881014	18.52	67	55	56	09	01	5	328	02 57 n	093 52 w	2.78
08	04	881014	18.52	67	55	56	09	01	5	328			0.62
08	05	881014	18.52	55	56	67	09	01	5	328			9.57
08	06	881014	18.52	55	56	67			5	328	03 03 n	093 56 w	2.78
08	07	881014	18.52	56	67	55			5	328			1.85
08	08	881014	18.52	56	67	55			5	328	03 06 n	093 57 w	0.62
09	01	881014	18.52	56	67	55			5	328	03 06 n	093 57 w	3.09
10	01	881014	18.52	31	64	69			5	328	03 12 n	094 02 w	1.23
10	02	881014	18.52	31	64	69	10	02	5	328			7.72
10	03	881014	18.52	64	69	31			4	328	03 17 n	094 05 w	2.16
10	04	881014	18.52	64	69	31	10	02	4	328			4.94

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
10	05	881014	18.52	67	55	56	10	02	5	328	03 20 n	094 07 w	3.70
10	06	881014	18.52	67	55	56			5	328			1.85
10	07	881014	18.52	67	55	56			5	328			1.54
11	01	881014	18.52	55	56	67	10	03	5	328	03 25 n	094 10 w	2.78
11	02	881014	18.52	55	56	67			5	328			4.63
11	03	881014	18.52	56	67	55			5	328	03 29 n	094 12 w	7.72
11	04	881014	18.52	56	67	55			5	328	03 32 n	094 15 w	0.31
01	01	881015	18.52	31	64	69			4	235	04 01 n	095 01 w	4.94
01	02	881015	18.52	64	69	31			4	235			6.17
01	03	881015	18.52	64	69	31	08	03	4	235			4.32
01	04	881015	18.52	56	67	55	08	02	4	235			5.25
01	05	881015	18.52	56	67	55			4	235			2.47
01	06	881015	18.52	56	67	55			4	235			2.47
01	07	881015	18.52	56	67	55	08	02	5	235	03 54 n	095 10 w	2.16
02	01	881015	18.52	67	55	56			5	235	03 52 n	095 13 w	4.63
02	02	881015	18.52	67	55	56	08	02	5	235			2.47
02	03	881015	18.52	67	55	56	08	02	5	235			2.47
02	04	881015	18.52	67	55	56			5	235			1.54
02	05	881015	18.52	55	56	67	08	02	5	235			2.78
02	06	881015	18.52	55	56	67			5	235	03 49 n	095 19 w	6.17
03	01	881015	18.52	31	64	69	08	01	5	233	03 45 n	095 23 w	3.70
03	02	881015	18.52	31	64	69			5	233			4.01
03	03	881015	18.52	31	64	69	08	01	5	233			3.40
03	04	881015	18.52	64	69	31	08	01	5	233			12.04
03	05	881015	18.52	69	31	64	08	01	5	233			10.80
03	06	881015	18.52	56	67	55	08	01	5	233	03 35 n	095 38 w	12.35
03	07	881015	18.52	67	55	56			5	233			2.16
03	08	881015	18.52	67	55	56	09	01	5	233			1.23
04	01	881015	18.52	31	64	69			4	233	03 19 n	095 59 w	12.35
04	02	881015	18.52	64	69	31	12	01	4	233			2.78
05	01	881015	18.52	64	69	31			4	233	03 15 n	096 06 w	1.54
05	02	881015	18.52	56	67	55			4	233			9.26
05	03	881015	18.52	67	55	56			4	233			9.26
05	04	881015	18.52	55	56	67			4	233			9.26
05	05	881015	18.52	31	64	69			4	233	03 06 n	096 18 w	2.16
01	01	881016	20.37	55	56	67			4	229	01 16 n	098 44 w	2.72
01	02	881016	20.37	55	56	67	01	02	4	229			2.72
01	03	881016	20.37	55	56	67			4	229			5.09
01	04	881016	20.37	64	69	31			4	229	01 13 n	098 48 w	5.09
01	05	881016	20.37	64	69	31	01	02	4	229			5.09
01	06	881016	20.37	69	31	64	01	02	4	229	01 09 n	098 52 w	10.19
01	07	881016	20.37	31	64	69			4	229	01 06 n	098 57 w	1.02
02	01	881016	20.37	31	64	69			4	229	01 05 n	098 59 w	4.75
02	02	881016	20.37	55	56	67			4	229	01 03 n	099 01 w	8.49
02	03	881016	20.37	56	67	55			4	229			7.47
02	04	881016	20.37	56	67	55			4	229	01 57 n	099 07 w	0.34
01	01	881017	18.52	69	31	64			1	226	00 05 n	100 17 w	0.31
02	01	881017	18.52	31	64	69			1	220	00 05 n	100 24 w	8.64
03	01	881017	18.52	67	55	56			1	231	00 02 s	100 32 w	5.25
03	02	881017	18.52	67	55	56	08	02	1	231	00 03 s	100 34 w	5.86
03	03	881017	18.52	55	56	67	08	02	1	231			5.25
04	01	881017	18.52	56	67	55	08	01	1	231	00 10 s	100 41 w	1.85

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
05	01	881017	18.52	69	31	64			2	231	00 14 s	100 44 w	2.78
06	01	881017	18.52	31	64	69			2	231	00 20 s	100 47 w	9.26
06	02	881017	18.52	64	69	31			3	231			4.94
06	03	881017	18.52	64	69	31	09	12	3	231			2.78
06	04	881017	18.52	67	55	56	10	12	3	231	00 25 s	100 55 w	6.48
07	01	881017	18.52	55	56	67	12	01	3	231	00 25 s	101 03 w	3.09
08	01	881017	18.52	55	56	67	01	01	3	231	00 26 s	101 06 w	0.31
09	01	881017	18.52	55	56	67	01	01	3	231	00 26 s	101 07 w	2.16
09	02	881017	18.52	69	31	64	01	01	3	231			12.04
09	03	881017	18.52	31	64	69	01	01	3	222	00 30 s	101 14 w	12.66
09	04	881017	18.52	64	69	31	01	02	3	222			7.72
10	01	881017	18.52	67	55	56	01	02	4	222	00 37 s	101 26 w	5.86
10	02	881017	18.52	67	55	56			4	222			4.63
11	01	881017	18.52	55	56	67			3	222	00 39 s	101 32 w	0.62
01	01	881018	18.52	56	67	55			3	220	01 32 s	102 43 w	3.70
01	02	881018	18.52	56	67	55	08	03	3	220	01 33 s	102 45 w	0.93
01	03	881018	18.52	56	67	55			3	220			3.40
01	04	881018	18.52	67	55	56			3	220			8.64
01	05	881018	18.52	55	56	67			3	220			2.47
02	01	881018	18.52	55	56	67			3	218	01 41 s	102 53 w	2.16
02	02	881018	18.52	31	64	69			3	218	01 42 s	102 53 w	4.01
02	03	881018	18.52	31	64	69			3	218			8.33
02	04	881018	18.52	64	69	31			3	218			3.09
03	01	881018	18.52	69	31	64			3	223	01 49 s	103 02 w	3.09
04	01	881018	18.52	56	67	55			3	221	01 50 s	103 08 w	1.23
05	01	881018	18.52	56	67	55			3	221	01 50 s	103 13 w	2.47
06	01	881018	18.52	67	55	56			2	220	01 52 s	103 13 w	9.26
06	02	881018	18.52	55	56	67	09	01	2	220	01 56 s	103 17 w	3.09
06	03	881018	18.52	55	56	67			2	220			1.54
07	01	881018	18.52	31	64	69	09	12	3	220	01 58 s	103 21 w	6.17
07	02	881018	18.52	31	64	69			3	220	02 01 s	103 23 w	1.54
07	03	881018	18.52	31	64	69	09	12	3	220			1.54
08	01	881018	18.52	56	67	55	01	01	3	220	02 12 s	103 25 w	3.09
09	01	881018	18.52	56	67	55	01	01	3	220	02 14 s	103 27 w	7.72
09	02	881018	18.52	67	55	56	01	01	3	220			10.80
09	03	881018	18.52	55	56	67	01	01	4	220			7.41
10	01	881018	18.52	31	64	69	01	02	3	220	02 27 s	103 38 w	4.94
11	01	881018	18.52	64	69	31	01	02	3	220	02 31 s	103 41 w	1.85
11	02	881018	18.52	64	69	31	03	02	3	180	02 32 s	103 42 w	1.85
12	01	881018	18.52	64	69	31	03	02	3	180	02 35 s	103 42 w	0.31
13	01	881018	18.52	56	67	55	03	03	3	180	02 39 s	103 36 w	9.57
13	02	881018	18.52	67	55	56	03	03	3	180			9.26
13	03	881018	18.52	67	55	56	03	03	3	180	02 50 s	103 37 w	0.31
01	01	881019	18.52	64	69	31			3	089	03 00 s	102 30 w	11.73
02	01	881019	18.52	69	31	64			4	088			7.72
02	02	881019	18.52	55	56	67			4	088	03 01 s	102 20 w	3.70
02	03	881019	18.52	55	56	67	12	02	4	088			1.85
02	04	881019	18.52	55	56	67			4	088			6.79
02	05	881019	18.52	56	67	55			4	088			6.17
02	06	881019	18.52	56	67	55	12	02	4	088			1.54
02	07	881019	18.52	56	67	55			4	088			4.63
02	08	881019	18.52	67	55	56			4	088			12.96

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
02	09	881019	18.52	64	69	31			4	088	03 00 s	102 01 w	11.73
02	10	881019	18.52	69	31	64	01	01	4	088			12.35
02	11	881019	18.52	31	64	69	01	01	4	088			12.35
02	12	881019	18.52	55	56	67	01	01	4	088	02 59 s	101 43 w	6.48
02	13	881019	18.52	55	56	67			4	088			5.86
02	14	881019	18.52	56	67	55			3	088			7.72
02	15	881019	18.52	56	67	55			4	088			4.63
02	16	881019	18.52	67	55	56			4	088			12.66
02	17	881019	16.67	64	69	31	06	01	4	090	02 58 s	101 25 w	10.83
02	18	881019	16.67	69	31	64	05	01	4	090			11.11
02	19	881019	16.67	31	64	69	05	02	4	090			6.11
03	01	881019	16.67	31	64	69	05	02	4	090	02 57 s	101 11 w	1.39
03	02	881019	16.67	55	56	67	06	02	4	090			8.06
03	03	881019	16.67	56	67	55	07	02	4	060			4.44
03	04	881019	16.67	56	67	55	06	02	4	090			4.17
03	05	881019	16.67	67	55	56	06	02	4	090			8.33
03	06	881019	16.67	64	69	31	05	02	4	090	02 55 s	101 55 w	8.33
03	07	881019	16.67	69	31	64	05	03	4	090			6.94
01	01	881020	18.52	67	55	56			3	090	02 57 s	099 38 w	4.01
02	01	881020	18.52	67	55	56			3	090	02 58 s	099 35 w	2.78
02	02	881020	18.52	55	56	67			3	090			2.47
02	03	881020	18.52	55	56	67	12	03	3	090			6.48
03	01	881020	18.52	69	31	64	12	02	4	090	02 50 s	099 26 w	3.09
04	01	881020	18.52	31	64	69	12	02	4	090	02 50 s	099 23 w	8.64
04	02	881020	18.52	64	69	31	01	01	4	090			7.41
04	03	881020	18.52	67	55	56	01	01	4	090	02 50 s	099 15 w	5.25
04	04	881020	18.52	67	55	56	01	01	5	090			7.10
04	05	881020	18.52	55	56	67	01	01	5	090	02 50 s	099 08 w	4.63
05	01	881020	18.52	56	67	55	01	01	4	090	02 49 s	099 02 w	8.03
06	01	881020	17.59	69	31	64	12	12	4	090	02 48 s	098 54 w	10.26
07	01	881020	17.59	31	64	69	05	01	4	091	02 45 s	098 47 w	6.45
08	01	881020	17.59	67	55	56	06	01	4	092	02 44 s	098 39 w	2.93
09	01	881020	17.59	55	56	67	05	02	4	092	02 43 s	098 36 w	2.93
09	02	881020	17.59	55	56	67	06	02	4	062	02 43 s	098 36 w	3.52
09	03	881020	17.59	55	56	67	05	02	4	092	02 42 s	098 33 w	2.64
09	04	881020	17.59	55	56	67	04	02	4	122	02 42 s	098 32 w	1.17
09	05	881020	17.59	69	31	64	04	02	4	122	02 42 s	098 31 w	4.69
09	06	881020	17.59	69	31	64	05	02	4	092	02 44 s	098 30 w	5.57
09	07	881020	17.59	31	64	69	05	02	4	092			6.16
10	01	881020	17.59	67	55	56	06	03	3	092	02 44 s	098 17 w	7.62
10	02	881020	17.59	55	56	67	06	03	2	092	02 44 s	098 13 w	6.16
10	03	881020	17.59	55	56	67	06	03	2	092	02 45 s	098 09 w	0.29
01	01	881021	18.52	31	64	69			3	092	02 42 s	096 59 w	1.23
02	01	881021	18.52	64	69	31	12	02	3	095	02 43 s	096 58 w	5.56
02	02	881021	18.52	64	69	31			3	095			3.40
02	03	881021	18.52	69	31	64			3	095			5.86
02	04	881021	18.52	56	67	55			3	095			8.03
02	05	881021	18.52	56	67	55	12	02	3	095			0.93
02	06	881021	18.52	56	67	55			3	095	02 44 s	096 44 w	3.40
02	07	881021	18.52	67	55	56			3	095			1.23
03	01	881021	18.52	55	56	67	12	01	2	091	02 48 s	096 40 w	3.09
03	02	881021	18.52	55	56	67			2	091			4.94

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
03	03	881021	18.52	55	56	67			2	125			1.85
03	04	881021	18.52	55	56	67			2	091			0.62
03	05	881021	18.52	31	64	69			2	091	02 49 s	096 35 w	4.32
04	01	881021	18.52	64	69	31			2	091	02 49 s	096 32 w	4.63
04	02	881021	18.52	64	69	31			3	091			6.17
04	03	881021	18.52	69	31	64			4	091			3.70
05	01	881021	18.52	56	67	55			3	095	02 46 s	096 25 w	1.85
05	02	881021	18.52	56	67	55	04	12	3	095			5.25
06	01	881021	18.52	67	55	56	03	01	3	162	02 49 s	096 19 w	0.62
07	01	881021	18.52	67	55	56	03	01	3	162	02 50 s	096 20 w	1.54
07	02	881021	18.52	67	55	56	03	01	4	162			3.09
08	01	881021	18.52	31	64	69	03	01	4	162	02 53 s	096 17 w	9.88
09	01	881021	18.52	56	67	55			3	162	02 58 s	096 16 w	6.17
09	02	881021	18.52	56	67	55			4	162			1.54
09	03	881021	18.52	67	55	56			4	162			5.86
10	01	881021	18.52	31	64	69	03	03	4	162	03 11 s	096 19 w	5.25
01	01	881022	18.52	55	56	67			4	162	04 30 s	096 01 w	4.94
01	02	881022	18.52	55	56	67	10	03	4	162			3.09
01	03	881022	18.52	56	67	55	10	03	4	162			11.42
01	04	881022	18.52	64	69	31	10	03	4	162			5.56
02	01	881022	18.52	69	31	64	10	02	4	162	04 42 s	096 00 w	8.33
03	01	881022	18.52	55	56	67	10	02	4	157	04 48 s	096 06 w	4.01
03	02	881022	18.52	55	56	67	10	01	4	157			7.72
03	03	881022	18.52	56	67	55	10	01	4	157			11.42
03	04	881022	18.52	67	55	56	10	01	4	157			2.16
04	01	881022	18.52	67	55	56	10	01	4	157	05 00 s	096 01 w	0.31
05	01	881022	18.52	67	55	56	10	01	4	157	05 01 s	096 01 w	4.63
05	02	881022	18.52	64	69	31	11	01	4	157	05 03 s	096 00 w	11.73
05	03	881022	18.52	69	31	64	12	12	4	157			12.35
05	04	881022	18.52	31	64	69	03	12	4	157			12.35
05	05	881022	18.52	55	56	67	03	01	4	157	05 20 s	095 53 w	12.35
05	06	881022	18.52	56	67	55	03	01	4	157			12.35
05	07	881022	18.52	67	55	56	03	01	4	157			12.96
05	08	881022	18.52	64	69	31	04	02	4	157	05 37 s	095 46 w	8.64
05	09	881022	18.52	69	31	64	04	02	4	157	05 42 s	095 44 w	9.26
05	10	881022	18.52	31	64	69	04	02	4	157	05 46 s	095 42 w	9.26
05	11	881022	18.52	55	56	67	04	02	4	157	05 50 s	095 41 w	10.80
05	12	881022	18.52	56	67	55	03	02	4	157			8.64
05	13	881022	18.52	56	67	55	03	02	4	157	05 59 s	095 36 w	0.31
01	01	881023	16.67	69	31	64	11	03	5	143	07 17 s	094 38 w	6.39
01	02	881023	16.67	31	64	69	11	03	5	143			6.95
01	03	881023	16.67	67	55	56	11	02	4	143	07 23 s	094 35 w	11.11
01	04	881023	16.67	55	56	67	11	02	4	143			11.11
01	05	881023	16.67	56	67	55	11	02	4	143			4.17
02	01	881023	16.67	69	31	64	10	01	4	143	07 35 s	094 24 w	11.11
02	02	881023	16.67	31	64	69	10	01	4	143			11.39
02	03	881023	16.67	64	69	31	10	01	4	143			4.17
03	01	881023	16.67	67	55	56	11	12	4	143	07 47 s	094 16 w	10.56
03	02	881023	16.67	55	56	67	12	12	4	143			10.83
03	03	881023	16.67	56	67	55	12	12	4	143			13.61
03	04	881023	16.67	69	31	64	04	01	4	143	08 02 s	094 04 w	3.89
03	05	881023	16.67	69	31	64			4	143			4.17

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
03	06	881023	16.67	31	64	69			4	143			1.67
03	07	881023	16.67	31	64	69	04	01	4	143			9.45
03	08	881023	16.67	64	69	31	04	01	4	143			7.50
04	01	881023	16.67	64	69	31	04	01	4	143			1.39
04	02	881023	16.67	67	55	56	04	02	4	143	08 15 s	093 54 w	8.33
04	03	881023	16.67	55	56	67	04	02	4	143			8.33
04	04	881023	16.67	56	67	55	04	02	4	143			8.33
04	05	881023	16.67	69	31	64	04	02	4	143			8.33
04	06	881023	16.67	31	64	69	04	02	4	143	08 30 s	093 43 w	7.50
04	07	881023	16.67	64	69	31			4	143			1.67
01	01	881024	14.82	56	67	55			4	060	07 46 s	092 42 w	6.91
01	02	881024	14.82	56	67	55	01	03	4	060			4.44
01	03	881024	14.82	67	55	56	01	03	4	060			5.93
01	04	881024	14.82	31	64	69	01	02	4	060	07 41 s	092 36 w	9.88
01	05	881024	14.82	64	69	31	01	02	4	060			9.88
01	06	881024	14.82	69	31	64	01	02	4	060			9.88
01	07	881024	14.82	56	67	55	01	01	4	060	07 33 s	092 24 w	9.88
01	08	881024	14.82	67	55	56	01	01	4	060			4.94
01	09	881024	14.82	67	55	56	01	01	4	060	07 29 s	092 18 w	0.74
02	01	881024	14.82	67	55	56	01	01	4	060	07 29 s	092 17 w	2.22
02	02	881024	14.82	55	56	67	01	01	4	060			9.88
02	03	881024	14.82	31	64	69	02	12	4	060	07 26 s	092 12 w	4.94
02	04	881024	14.82	31	64	69			4	060			2.72
03	01	881024	14.82	64	69	31	02	12	4	080	07 23 s	092 07 w	1.48
04	01	881024	14.82	64	69	31	02	12	4	080	07 23 s	092 05 w	1.48
05	01	881024	14.82	56	67	55			4	080	07 24 s	091 55 w	3.46
05	02	881024	14.82	56	67	55	06	01	4	080			0.99
05	03	881024	14.82	56	67	55			4	050			1.23
05	04	881024	14.82	56	67	55	07	01	4	050			1.48
05	05	881024	14.82	67	55	56	06	01	4	080	07 23 s	091 52 w	2.22
05	06	881024	14.82	67	55	56			4	080			2.22
05	07	881024	14.82	67	55	56	06	01	4	080			2.72
05	08	881024	14.82	55	56	67	06	01	4	080	07 23 s	091 49 w	3.70
05	09	881024	14.82	55	56	67	07	01	4	050	07 22 s	091 47 w	2.47
05	10	881024	14.82	55	56	67			4	050			2.22
05	11	881024	14.82	31	64	69	06	02	4	080			6.42
05	12	881024	14.82	64	69	31			4	080	07 20 s	091 42 w	2.47
05	13	881024	14.82	64	69	31	09	02	4	340	07 20 s	091 41 w	4.94
05	14	881024	14.82	69	31	64	09	02	4	340	07 18 s	091 42 w	7.41
05	15	881024	14.82	56	67	55	09	02	4	340	07 14 s	091 43 w	3.70
05	16	881024	14.82	56	67	55	06	02	5	080	07 12 s	091 44 w	1.73
05	17	881024	14.82	56	67	55	06	02	5	080	07 12 s	091 43 w	0.25
01	01	881025	18.52	64	69	31			4	050	06 07 s	090 28 w	4.01
01	02	881025	18.52	64	69	31	02	03	4	050			2.47
01	03	881025	18.52	64	69	31	02	03	4	050			4.01
01	04	881025	18.52	69	31	64	02	03	5	050			3.40
01	05	881025	18.52	69	31	64			5	050	06 03 s	090 23 w	3.09
01	06	881025	18.52	69	31	64	02	02	5	050			4.63
01	01	881026	18.52	55	56	67			3	055	03 58 s	088 06 w	8.64
01	02	881026	18.52	56	67	55			3	055			8.64
01	03	881026	18.52	67	55	56			3	055	03 53 s	088 00 w	5.56
01	04	881026	18.52	67	55	56			3	055			3.09

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
01	05	881026	18.52	69	31	64			3	055	03 50 s	087 58 w	0.31
02	01	881026	18.52	31	64	69			2	055	03 43 s	087 53 w	4.94
03	01	881026	18.52	31	64	69			2	055	03 40 s	087 51 w	5.56
03	02	881026	18.52	55	56	67			2	055	03 38 s	087 49 w	10.49
03	03	881026	18.52	55	56	67	01	01	2	055			1.85
03	04	881026	18.52	56	67	55	01	01	2	055			12.35
03	05	881026	18.52	67	55	56	02	01	3	055			7.72
03	06	881026	18.52	67	55	56	03	01	3	055			4.63
03	07	881026	18.52	69	31	64	03	01	3	055	03 26 s	087 35 w	12.35
03	08	881026	18.52	31	64	69	12	12	3	055			7.10
03	09	881026	18.52	31	64	69			3	055	03 20 s	087 27 w	3.70
03	10	881026	18.52	31	64	69	12	12	3	055			1.85
03	11	881026	18.52	64	69	31	06	01	3	055	03 18 s	087 24 w	2.78
04	01	881026	18.52	64	69	31	06	01	3	055	03 16 s	087 23 w	4.94
04	02	881026	18.52	64	69	31			3	055			3.09
04	03	881026	18.52	55	56	67			2	055	03 14 s	087 20 w	9.88
04	04	881026	18.52	55	56	67			2	060	03 11 s	087 17 w	2.47
04	05	881026	18.52	56	67	55			2	060			4.01
04	06	881026	18.52	56	67	55	06	01	2	060			1.54
05	01	881026	18.52	56	67	55	06	01	3	060	03 07 s	087 13 w	0.93
06	01	881026	18.52	67	55	56	07	02	2	060	03 07 s	087 13 w	1.85
07	01	881026	18.52	69	31	64	07	02	2	060	03 04 s	087 12 w	9.26
07	02	881026	18.52	31	64	69			2	060	03 02 s	087 08 w	1.23
08	01	881026	18.52	64	69	31			3	060	03 02 s	087 06 w	4.94
08	02	881026	18.52	64	69	31	07	02	3	060	03 00 s	087 04 w	1.54
08	03	881026	18.52	64	69	31			3	060			0.93
08	04	881026	18.52	55	56	67			3	060	03 00 s	087 03 w	8.33
09	01	881026	18.52	56	67	55			3	060			2.78
09	02	881026	18.52	56	67	55			3	060	02 55 s	086 56 w	0.31
01	01	881027	18.52	31	64	69	10	03	2	149	02 51 s	085 28 w	9.88
01	02	881027	18.52	64	69	31			3	149	02 55 s	085 27 w	7.72
02	01	881027	18.52	67	55	56	10	02	3	149	03 02 s	085 29 w	2.16
03	01	881027	18.52	67	55	56	10	02	3	149	03 04 s	085 28 w	0.31
04	01	881027	18.52	55	56	67	10	02	3	149	03 06 s	085 29 w	4.32
05	01	881027	18.52	56	67	55	10	01	3	148	03 10 s	085 25 w	3.09
05	02	881027	18.52	31	64	69	10	01	3	148			11.11
06	01	881027	18.52	64	69	31	11	01	3	148	03 16 s	085 20 w	1.54
07	01	881027	18.52	69	31	64	11	01	3	148	03 18 s	085 19 w	9.26
07	02	881027	18.52	67	55	56	12	12	3	148	03 22 s	085 17 w	6.17
08	01	881027	18.52	55	56	67	01	12	3	148	03 26 s	085 14 w	10.49
08	02	881027	18.52	56	67	55	03	01	4	148			12.04
09	01	881027	18.52	31	64	69	03	01	4	148	03 36 s	085 06 w	1.54
10	01	881027	18.52	64	69	31	03	01	3	148	03 38 s	085 02 w	5.56
10	02	881027	18.52	64	69	31	02	01	3	178	03 40 s	085 01 w	7.10
10	03	881027	18.52	69	31	64	03	02	3	168			0.62
11	01	881027	18.52	67	55	56	03	02	3	149	03 44 s	085 00 w	1.23
12	01	881027	18.52	67	55	56	03	02	3	149	03 46 s	084 58 w	1.23
13	01	881027	18.52	67	55	56	03	02	3	149	03 47 s	084 59 w	3.70
13	02	881027	18.52	55	56	67	03	02	3	149			8.95
01	01	881028	18.52	56	67	55			3	140	05 05 s	084 13 w	4.63
01	02	881028	18.52	56	67	55	11	03	3	140			5.56
01	03	881028	18.52	67	55	56	11	03	4	140	05 08 s	084 10 w	10.49

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
01	04	881028	18.52	55	56	67	11	03	4	140	05 14 s	084 06 w	5.25
01	05	881028	18.52	55	56	67	11	02	4	140			4.94
01	06	881028	18.52	64	69	31	11	02	4	140	05 16 s	084 04 w	12.35
01	07	881028	18.52	69	31	64	11	02	4	140			12.35
01	08	881028	18.52	31	64	69	11	02	4	140			6.17
02	01	881028	18.52	31	64	69	11	01	4	150	05 30 s	083 52 w	1.54
02	02	881028	18.52	56	67	55	11	01	4	150	05 30 s	083 58 w	12.35
02	03	881028	18.52	67	55	56	11	01	4	150			12.35
02	04	881028	18.52	55	56	67	11	01	4	150			6.79
02	05	881028	18.52	55	56	67			4	150			1.85
02	06	881028	18.52	55	56	67	12	12	4	150			4.01
02	07	881028	18.52	64	69	31			4	150	05 47 s	083 42 w	9.26
02	08	881028	18.52	64	69	31	02	12	4	150	05 51 s	083 40 w	2.78
03	01	881028	18.52	69	31	64	02	12	4	150	05 54 s	083 39 w	9.26
04	01	881028	18.52	31	64	69			4	150	05 58 s	083 36 w	4.63
04	02	881028	18.52	56	67	55			4	150	06 00 s	083 35 w	12.35
04	03	881028	18.52	67	55	56			4	150			3.09
04	04	881028	18.52	67	55	56	04	01	4	150	06 07 s	083 31 w	0.62
05	01	881028	18.52	67	55	56	04	01	4	150	06 07 s	083 31 w	4.94
05	02	881028	18.52	55	56	67	04	02	4	150			12.35
05	03	881028	18.52	64	69	31	04	02	4	150	06 15 s	083 27 w	9.26
05	04	881028	18.52	69	31	64	04	02	4	150	06 18 s	083 24 w	9.26
05	05	881028	18.52	31	64	69	04	02	4	150	06 22 s	083 22 w	3.09
05	06	881028	18.52	31	64	69			4	150			6.17
05	07	881028	18.52	56	67	55			4	150	06 26 s	083 19 w	8.03
05	08	881028	18.52	67	55	56			4	150	06 31 s	083 16 w	8.64
05	09	881028	18.52	67	55	56			4	150	06 33 s	083 15 w	0.31
01	01	881029	18.52	69	31	64			5	148	07 52 s	082 31 w	5.86
01	02	881029	18.52	69	31	64			5	152			4.94
01	03	881029	18.52	31	64	69			5	152			4.63
01	04	881029	18.52	31	64	69			4	152			4.63
01	05	881029	18.52	64	69	31			4	152			8.33
01	06	881029	18.52	64	69	31			4	147			0.93
01	07	881029	18.52	55	56	67			4	147	08 05 s	082 23 w	12.35
01	08	881029	18.52	56	67	55			4	147			5.25
02	01	881029	18.52	56	67	55			4	147	08 12 s	082 16 w	1.54
02	02	881029	18.52	67	55	56			4	147			12.35
02	03	881029	18.52	69	31	64			4	147			12.35
02	04	881029	18.52	31	64	69			4	147			7.41
02	05	881029	18.52	31	64	69			4	237	08 27 s	082 15 w	5.25
02	06	881029	18.52	64	69	31			4	237			3.70
03	01	881029	18.52	64	69	31			4	237	08 31 s	082 20 w	1.23
03	02	881029	18.52	55	56	67			4	237			4.63
04	01	881029	18.52	55	56	67			4	237	08 33 s	082 24 w	5.86
04	02	881029	18.52	56	67	55			4	237			11.11
05	01	881029	18.52	67	55	56			4	237	08 39 s	082 33 w	8.03
06	01	881029	18.52	67	55	56			4	237	08 41 s	082 37 w	1.54
06	02	881029	18.52	69	31	64			4	237			12.35
06	03	881029	18.52	31	64	69			4	237			9.26
06	04	881029	18.52	31	64	69			4	238			3.40
06	05	881029	18.52	64	69	31			4	238			10.19
07	01	881029	18.52	55	56	67			4	238	08 53 s	082 55 w	6.17

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
07	02	881029	18.52	55	56	67			4	238			1.54
07	03	881029	18.52	56	67	55			4	238			11.42
07	04	881029	18.52	67	55	56			4	238			7.10
07	05	881029	18.52	69	31	64	01	03	4	238	09 00 s	083 11 w	1.85
07	06	881029	18.52	69	31	64			4	238			2.78
01	01	881030	18.52	31	64	69	12	12	4	236	10 35 s	085 27 w	10.80
01	02	881030	18.52	64	69	31	12	12	4	236			5.86
01	03	881030	18.52	64	69	31			4	236			4.32
01	04	881030	18.52	69	31	64	01	01	4	236	10 42 s	085 37 w	4.63
01	05	881030	18.52	69	31	64			4	102	10 43 s	085 38 w	3.09
01	06	881030	18.52	69	31	64	05	01	4	102			2.16
01	07	881030	18.52	67	55	56	05	01	5	102	10 43 s	085 36 w	5.25
01	08	881030	18.52	67	55	56	05	01	5	099	10 44 s	085 33 w	2.16
01	09	881030	18.52	67	55	56	05	01	5	102	10 44 s	085 32 w	4.94
01	10	881030	18.52	55	56	67	05	01	5	102	10 44 s	085 29 w	0.62
02	01	881030	18.52	55	56	67	05	01	5	102	10 44 s	085 28 w	2.78
02	02	881030	18.52	55	56	67	05	01	5	102	10 44 s	085 27 w	0.31
01	01	881108	18.52	31	64	69			4	287	11 43 s	079 07 w	3.09
02	01	881108	18.52	31	64	69			4	287	11 43 s	079 07 w	8.03
02	02	881108	18.52	64	69	31			4	287			13.27
02	03	881108	18.52	69	31	64			4	287			8.03
03	01	881108	18.52	56	55	67			4	287	11 38 s	079 23 w	12.04
03	02	881108	18.52	55	67	56			4	287			4.32
03	03	881108	18.52	55	67	56	06	01	4	287	11 35 s	079 33 w	1.23
04	01	881108	18.52	55	67	56	06	01	4	287	11 35 s	079 34 w	4.32
04	02	881108	18.52	67	56	55	06	01	4	287			9.26
04	03	881108	18.52	67	56	55			4	287			3.09
04	04	881108	18.52	31	64	69	06	01	4	287	11 32 s	079 43 w	3.40
05	01	881108	18.52	69	31	64	12	12	4	287	11 30 s	079 48 w	9.26
05	02	881108	18.52	56	55	67	12	12	4	287			12.35
05	03	881108	18.52	55	67	56			4	287			6.17
05	04	881108	18.52	55	67	56			3	287			6.17
05	05	881108	18.52	67	56	55			4	287			12.35
05	06	881108	18.52	31	64	69			4	287	11 22 s	080 13 w	12.35
05	07	881108	18.52	64	69	31			4	287			12.35
05	08	881108	18.52	69	31	64			4	287			12.35
05	09	881108	18.52	56	55	67			4	287	11 16 s	080 33 w	9.26
05	10	881108	18.52	55	67	56			4	287			0.62
05	11	881108	18.52	55	67	56	11	02	4	287			1.23
05	12	881108	18.52	55	67	56			4	287			7.41
05	13	881108	18.52	67	56	55			4	287	11 13 s	080 42 w	1.54
06	01	881108	18.52	67	56	55			4	287	11 13 s	080 44 w	4.94
06	02	881108	18.52	31	64	69			4	287	11 12 s	080 47 w	13.89
01	01	881109	18.52	67	56	55			4	287	10 53 s	082 04 w	12.35
01	02	881109	18.52	56	55	67			4	287			12.35
01	03	881109	18.52	55	67	56			4	287			5.56
02	01	881109	18.52	64	69	31			4	287	10 49 s	082 21 w	6.48
03	01	881109	18.52	69	31	64			4	287	10 48 s	082 26 w	13.27
03	02	881109	18.52	31	64	69			4	287			4.63
03	03	881109	18.52	31	64	69			3	287			7.72
03	04	881109	18.52	67	56	55	06	01	3	287	10 44 s	082 41 w	12.35
03	05	881109	18.52	56	55	67	06	01	3	287			7.72

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
03	06	881109	18.52	56	55	67			3	287			4.94
03	07	881109	18.52	55	67	56			4	287			12.04
03	08	881109	18.52	64	69	31	12	12	3	287	10 38 s	082 59 w	12.35
03	09	881109	18.52	69	31	64	12	12	3	287			12.35
03	10	881109	18.52	31	64	69	11	01	3	287			12.35
03	11	881109	18.52	67	56	55	11	01	3	287	10 32 s	083 18 w	12.35
03	12	881109	18.52	56	55	67	11	01	3	287			9.26
04	01	881109	18.52	56	55	67	11	01	3	287	10 29 s	083 30 w	2.16
04	02	881109	18.52	55	67	56			3	287			12.35
04	03	881109	18.52	64	69	31			3	287	10 27 s	083 38 w	1.85
05	01	881109	18.52	64	69	31			3	287	10 27 s	083 39 w	5.56
05	02	881109	18.52	69	31	64			3	287	10 26 s	083 43 w	1.85
06	01	881109	18.52	31	64	69			3	287	10 25 s	083 45 w	9.26
06	02	881109	18.52	67	56	55			3	287	10 23 s	083 49 w	8.03
07	01	881109	18.52	56	55	67			3	287	10 22 s	083 55 w	1.54
01	01	881110	18.52	69	31	64	06	03	3	287	09 53 s	085 08 w	10.80
01	02	881110	18.52	31	64	69	06	03	3	287			7.72
01	03	881110	18.52	31	64	69	06	02	3	287			3.09
01	04	881110	18.52	64	69	31	06	02	3	287			6.48
01	05	881110	18.52	64	69	31	06	02	4	287			4.32
01	06	881110	18.52	55	67	56	06	02	4	287	09 48 s	085 27 w	10.80
02	01	881110	18.52	67	56	55	06	01	4	289	09 39 s	085 33 w	0.62
03	01	881110	18.52	67	56	55	06	01	4	289			7.72
03	02	881110	18.52	69	31	64			4	289			9.26
03	03	881110	18.52	69	31	64			4	287	09 35 s	085 43 w	3.09
03	04	881110	18.52	31	64	69			4	287			8.03
04	01	881110	18.52	55	67	56	07	12	3	287	09 29 s	085 58 w	5.86
04	02	881110	18.52	55	67	56	08	12	3	287			3.70
04	03	881110	18.52	55	67	56	09	12	3	287			1.54
04	04	881110	18.52	67	56	55	09	12	3	287			2.47
05	01	881110	18.52	56	55	67			3	287	09 21 s	086 12 w	6.17
05	02	881110	18.52	69	31	64			3	287			12.35
05	03	881110	18.52	31	64	69			3	287			6.79
05	04	881110	18.52	31	64	69	11	01	3	287			5.56
05	05	881110	18.52	64	69	31	11	01	3	287			9.57
05	06	881110	18.52	64	69	31			3	287			2.78
05	07	881110	18.52	55	67	56			4	287	09 14 s	086 35 w	9.26
05	08	881110	18.52	67	56	55			4	287			9.26
05	09	881110	18.52	56	55	67			4	287			4.32
06	01	881110	18.52	69	31	64			4	286	09 08 s	086 51 w	3.09
07	01	881110	18.52	31	64	69			4	286	09 10 s	086 57 w	1.23
01	01	881111	18.52	56	55	67			3	287	08 52 s	088 10 w	9.88
01	02	881111	18.52	55	67	56			3	287	08 51 s	088 14 w	1.85
02	01	881111	18.52	67	56	55			3	287	08 51 s	088 19 w	7.72
02	02	881111	18.52	31	64	69			3	287	08 50 s	088 23 w	12.35
02	03	881111	18.52	64	69	31			4	287			6.17
02	04	881111	18.52	64	69	31			4	289	08 47 s	088 33 w	6.17
03	01	881111	18.52	69	31	64			4	289	08 46 s	088 38 w	9.26
03	02	881111	18.52	56	55	67			4	289	08 44 s	088 42 w	12.35
03	03	881111	18.52	55	67	56	06	01	4	289			11.11
04	01	881111	18.52	67	56	55	06	01	4	289	08 39 s	088 55 w	11.42
01	02	881111	18.52	31	64	69	12	12	4	289	08 37 s	089 02 w	12.35

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
04	03	881111	18.52	64	69	31	09	12	4	289			12.35
04	04	881111	18.52	69	31	64	10	01	4	289			12.35
04	05	881111	18.52	56	55	67	11	01	4	289	08 31 s	089 22 w	12.35
04	06	881111	18.52	55	67	56	11	01	4	289			12.35
04	07	881111	18.52	67	56	55	11	01	4	289			8.95
05	01	881111	18.52	31	64	69	10	02	4	325	08 24 s	089 41 w	10.80
05	02	881111	18.52	64	69	31	10	02	4	325	08 19 s	089 46 w	8.33
05	03	881111	18.52	56	55	67	10	02	4	325	08 13 s	089 50 w	9.57
05	04	881111	18.52	55	67	56	10	03	4	325	08 09 s	089 52 w	0.62
06	01	881111	18.52	55	67	56	10	03	4	325	08 09 s	089 53 w	5.86
06	02	881111	18.52	67	56	55	10	03	4	325	08 06 s	089 55 w	3.40
06	03	881111	18.52	67	56	55	10	03	4	325	08 04 s	089 56 w	0.31
01	01	881112	18.52	64	69	31			3	287	07 48 s	091 09 w	6.17
01	02	881112	18.52	64	69	31			4	287			6.17
01	03	881112	18.52	69	31	64			4	287			12.35
01	04	881112	18.52	67	56	55			4	287	07 45 s	091 22 w	4.01
01	05	881112	18.52	67	56	55	06	02	4	287			8.33
01	06	881112	18.52	56	55	67	06	02	4	287			12.35
01	07	881112	18.52	55	67	56	06	01	4	287			12.35
01	08	881112	18.52	64	69	31	06	01	4	287	07 40 s	091 42 w	7.10
02	01	881112	18.52	69	31	64	06	01	4	287	07 39 s	091 47 w	9.88
02	02	881112	18.52	31	64	69	06	01	4	287			12.35
02	03	881112	18.52	67	56	55	06	12	4	287	07 36 s	091 59 w	12.35
02	04	881112	18.52	56	55	67	06	12	4	287			4.63
02	05	881112	18.52	56	55	67			4	287			4.94
02	06	881112	18.52	56	55	67			4	287			2.78
02	07	881112	18.52	55	67	56			4	287			7.41
02	08	881112	18.52	55	67	56	10	01	4	287			2.78
02	09	881112	18.52	55	67	56			4	287			2.47
02	10	881112	18.52	64	69	31			4	287	07 31 s	092 19 w	3.09
03	01	881112	18.52	64	69	31			4	287	07 30 s	092 21 w	5.86
03	02	881112	18.52	64	69	31	11	01	4	287			1.85
03	03	881112	18.52	69	31	64			4	287			12.35
03	04	881112	18.52	31	64	69			4	287			12.35
03	05	881112	18.52	67	56	55			4	287	07 25 s	092 38 w	3.40
03	06	881112	18.52	67	56	55	11	02	4	287			6.17
03	07	881112	18.52	56	55	67			4	287			8.95
03	08	881112	18.52	55	67	56			4	287	07 22 s	092 48 w	4.94
04	01	881112	18.52	69	31	64	11	03	4	285	07 18 s	093 00 w	9.88
04	02	881112	18.52	31	64	69	11	03	4	285			2.78
01	01	881113	18.52	55	67	56			4	284	06 58 s	094 13 w	6.79
01	02	881113	18.52	67	56	55			4	284	06 58 s	094 17 w	7.10
01	03	881113	18.52	56	55	67			4	284			5.25
01	04	881113	18.52	56	55	67			4	284			1.85
01	05	881113	18.52	69	31	64			4	284	06 56 s	094 25 w	6.17
01	06	881113	18.52	69	31	64	06	02	4	284			6.17
01	07	881113	18.52	31	64	69			4	284			7.41
01	08	881113	18.52	31	64	69			4	286	06 54 s	094 36 w	6.17
01	09	881113	18.52	64	69	31			4	286			4.63
01	10	881113	18.52	64	69	31	06	02	4	286			1.85
01	11	881113	18.52	64	69	31			4	286			4.63
01	12	881113	18.52	55	67	56			4	286	06 52 s	094 45 w	2.16

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
01	13	881113	18.52	55	67	56			4	289	06 51 s	094 45 w	7.72
01	14	881113	18.52	55	67	56	06	01	4	289	06 50 s	094 49 w	1.85
02	01	881113	18.52	67	56	55	07	01	4	284	06 41 s	094 57 w	2.78
02	02	881113	18.52	69	31	64	07	01	4	284	06 40 s	094 59 w	12.35
02	03	881113	18.52	31	64	69			5	284			4.63
02	04	881113	18.52	31	64	69	12	12	5	284			7.72
02	05	881113	18.52	64	69	31			5	284			4.32
03	01	881113	18.52	55	67	56	11	01	5	284	06 42 s	095 17 w	5.86
03	02	881113	18.52	55	67	56	11	01	5	284	06 41 s	095 20 w	5.86
03	03	881113	18.52	67	56	55	10	01	5	284			4.94
03	04	881113	18.52	67	56	55			5	284	06 40 s	095 25 w	1.54
03	05	881113	18.52	67	56	55	10	01	5	284			4.94
03	06	881113	18.52	56	55	67	10	01	5	284			5.56
03	07	881113	18.52	56	55	67			5	284			4.94
03	08	881113	18.52	56	55	67	10	02	5	284			0.62
03	09	881113	18.52	69	31	64	10	02	5	284			1.54
03	10	881113	18.52	69	31	64	10	02	5	315	06 38 s	095 35 w	7.72
03	11	881113	18.52	31	64	69	10	02	5	315	06 35 s	095 39 w	9.26
03	12	881113	18.52	64	69	31	10	02	5	315	06 31 s	095 42 w	9.26
03	13	881113	18.52	55	67	56			5	315	06 28 s	095 46 w	8.33
03	14	881113	18.52	55	67	56			5	315	06 24 s	095 52 w	2.47
03	15	881113	18.52	67	56	55			5	280	06 23 s	095 50 w	7.72
04	01	881113	18.52	67	56	55			5	280	06 22 s	095 56 w	2.47
04	02	881113	18.52	56	55	67			5	280			5.25
04	03	881113	18.52	56	55	67			5	280	06 21 s	096 01 w	0.31
01	01	881114	18.52	31	64	69			4	279	06 07 s	097 14 w	7.72
01	02	881114	18.52	64	69	31			4	279			9.26
01	03	881114	18.52	56	55	67			4	279	06 05 s	097 23 w	7.41
02	01	881114	18.52	55	67	56			4	279	06 06 s	097 30 w	10.80
02	02	881114	18.52	67	56	55			4	279			2.78
03	01	881114	18.52	67	56	55			4	279	06 05 s	097 39 w	4.63
03	02	881114	18.52	31	64	69			4	279			12.35
03	03	881114	18.52	64	69	31			4	279			6.79
03	04	881114	18.52	64	69	31	06	01	4	279			5.56
03	05	881114	18.52	69	31	64			4	279			12.35
03	06	881114	18.52	56	55	67			4	279	06 01 s	098 02 w	12.35
03	07	881114	18.52	55	67	56			4	279			4.94
03	08	881114	18.52	55	67	56	09	12	4	279			7.41
03	09	881114	18.52	67	56	55	10	12	4	279			7.72
04	01	881114	18.52	31	64	69			4	279	05 58 s	098 22 w	5.86
04	02	881114	14.82	31	64	69			4	279	05 57 s	098 25 w	4.44
04	03	881114	14.82	64	69	31	11	01	4	279			3.70
05	01	881114	14.82	64	69	31	11	01	5	279	05 56 s	098 30 w	4.94
05	02	881114	14.82	69	31	64	11	01	5	279			5.93
05	03	881114	18.52	69	31	64	11	01	5	279	05 55 s	098 35 w	2.16
06	01	881114	18.52	56	55	67	11	01	5	279	05 54 s	098 39 w	7.72
07	01	881114	18.52	55	67	56	11	02	5	279	05 54 s	098 44 w	4.94
07	02	881114	18.52	55	67	56			5	279			3.70
07	03	881114	18.52	67	56	55			5	279	05 53 s	098 48 w	6.17
08	01	881114	18.52	31	64	69			4	279	05 52 s	098 54 w	1.54
08	02	881114	18.52	31	64	69	11	02	4	279			8.03
08	03	881114	18.52	64	69	31	11	02	4	279	05 51 s	099 01 w	1.54

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
09	01	881114	18.52	69	31	64	11	03	4	279	05 51 s	099 08 w	2.16
01	01	881115	18.52	67	56	55			4	285	05 44 s	100 29 w	9.88
01	02	881115	18.52	56	55	67			4	285	05 43 s	100 35 w	9.88
01	03	881115	18.52	55	67	56			4	285	05 42 s	100 41 w	1.54
01	04	881115	18.52	55	67	56			4	289	05 42 s	100 41 w	8.03
01	05	881115	18.52	64	69	31			4	289	05 40 s	100 46 w	12.35
01	06	881115	18.52	69	31	64			4	289			6.17
02	01	881115	18.52	69	31	64			4	289	05 38 s	100 57 w	4.32
02	02	881115	18.52	31	64	69			4	289			12.35
03	01	881115	18.52	67	56	55			4	289	05 35 s	101 36 w	4.63
04	01	881115	18.52	56	55	67	07	01	4	289	05 33 s	101 11 w	7.72
04	02	881115	18.52	55	67	56	07	12	4	289			7.41
04	03	881115	18.52	64	69	31	08	12	4	289	05 31 s	101 19 w	8.03
04	04	881115	18.52	64	69	31	09	12	4	289			4.32
04	05	881115	18.52	69	31	64	09	01	4	289			6.17
04	06	881115	18.52	69	31	64	10	01	4	277	05 28 s	101 30 w	6.17
04	07	881115	18.52	31	64	69	10	01	4	277			12.35
04	08	881115	18.52	67	56	55	11	01	4	277	05 27 s	101 41 w	12.35
04	09	881115	18.52	56	55	67	11	01	4	277			12.35
04	10	881115	18.52	55	67	56	11	01	4	277			0.93
04	11	881115	18.52	55	67	56			4	277			2.16
05	01	881115	18.52	55	67	56			4	277	05 26 s	101 59 w	2.16
05	02	881115	18.52	64	69	31			4	277	05 26 s	102 00 w	9.26
05	03	881115	18.52	69	31	64			4	277	05 25 s	102 06 w	9.26
05	04	881115	18.52	31	64	69			4	277	05 24 s	102 12 w	7.72
05	05	881115	18.52	67	56	55			4	277			6.17
06	01	881115	18.52	56	55	67			4	277	05 24 s	102 22 w	7.72
06	02	881115	18.52	55	67	56			4	277			8.33
06	03	881115	18.52	55	67	56			4	277	05 23 s	102 30 w	0.31
01	01	881116	18.52	69	31	64			4	273	05 17 s	103 49 w	8.33
01	02	881116	18.52	31	64	69			5	273			7.72
01	03	881116	18.52	64	69	31			5	273			9.26
01	04	881116	18.52	55	67	56			4	273	05 16 s	104 04 w	12.35
01	05	881116	18.52	67	56	55			4	273			10.80
02	01	881116	18.52	64	69	31	07	01	4	265	05 07 s	104 30 w	0.93
02	02	881116	18.52	64	69	31	08	01	4	235	05 07 s	104 31 w	4.32
02	03	881116	18.52	64	69	31			4	273	05 08 s	104 33 w	8.33
02	04	881116	18.52	55	67	56			4	273			12.35
02	05	881116	18.52	67	56	55			4	273			12.35
02	06	881116	18.52	56	55	67			4	273			11.73
02	07	881116	18.52	69	31	64			4	310	05 07 s	104 58 w	3.70
02	08	881116	18.52	69	31	64	11	01	4	265	05 06 s	105 00 w	9.26
02	09	881116	18.52	31	64	69	11	01	5	265			1.23
03	01	881116	18.52	31	64	69	11	01	5	265	05 07 s	105 07 w	7.41
03	02	881116	18.52	64	69	31	11	01	5	265			3.09
03	03	881116	18.52	64	69	31	12	01	5	235	05 08 s	105 14 w	4.63
03	04	881116	18.52	64	69	31	11	01	5	270	05 10 s	105 17 w	3.09
03	05	881116	18.52	64	69	31	10	01	5	300	05 09 s	105 17 w	1.54
03	06	881116	18.52	55	67	56			5	300			2.16
03	07	881116	18.52	55	67	56			4	270	05 08 s	105 19 w	5.25
03	08	881116	18.52	55	67	56	11	02	4	270			1.85
03	09	881116	18.52	67	56	55	11	02	4	270			3.40

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
03	10	881116	18.52	67	56	55	11	02	4	290	05 08 s	105 26 w	5.86
03	11	881116	18.52	56	55	67	11	02	5	290			6.17
03	12	881116	18.52	56	55	67			5	290			3.09
03	13	881116	18.52	69	31	64			5	271	05 05 s	105 35 w	7.72
03	14	881116	18.52	31	64	69			5	271			3.09
03	15	881116	18.52	31	64	69	11	03	5	271			5.56
03	16	881116	18.52	64	69	31			5	271			4.94
03	17	881116	18.52	64	69	31	11	03	5	271			4.32
01	01	881117	18.52	56	55	67			5	273	05 10 s	107 15 w	6.17
01	02	881117	18.52	55	67	56			5	273			4.01
01	03	881117	18.52	55	67	56			5	276	05 10 s	107 20 w	2.16
01	04	881117	18.52	67	56	55			5	276			3.09
01	05	881117	18.52	67	56	55			5	276			3.09
01	06	881117	18.52	31	64	69			5	276	05 10 s	107 25 w	12.35
01	07	881117	18.52	64	69	31			5	276			11.11
02	01	881117	18.52	56	55	67			4	270	05 02 s	108 27 w	8.33
02	02	881117	18.52	55	67	56			4	270			8.03
03	01	881117	18.52	67	56	55			4	270			7.72
03	02	881117	18.52	31	64	69			4	270	05 01 s	108 42 w	1.54
03	03	881117	18.52	31	64	69	11	01	4	270			4.63
03	04	881117	18.52	31	64	69			4	270			3.09
03	05	881117	18.52	64	69	31			4	270	05 01 s	108 48 w	1.85
04	01	881117	18.52	69	31	64			4	270	05 03 s	108 50 w	3.70
04	02	881117	18.52	69	31	64	11	02	4	270			4.63
04	03	881117	18.52	56	55	67	11	02	4	270	05 03 s	108 56 w	9.57
04	04	881117	18.52	55	67	56			4	270	05 02 s	109 00 w	9.88
04	05	881117	18.52	67	56	55			4	270	05 02 s	109 06 w	2.47
05	01	881117	18.52	67	56	55			4	270	05 04 s	109 08 w	4.63
05	02	881117	18.52	67	56	55			4	270	05 04 s	109 12 w	0.31
01	01	881118	18.52	67	56	55			3	286	04 58 s	110 01 w	7.72
01	02	881118	18.52	56	55	67			3	286			7.72
01	03	881118	18.52	55	67	56			3	286			7.72
01	04	881118	18.52	64	69	31			3	286	04 56 s	110 14 w	12.35
02	01	881118	18.52	69	31	64			3	288	04 52 s	110 32 w	5.56
02	02	881118	18.52	67	56	55			3	288			10.80
02	03	881118	18.52	67	56	55			4	288			1.54
02	04	881118	18.52	56	55	67			4	288			5.25
02	05	881118	18.52	56	55	67			4	308	04 49 s	110 45 w	7.10
02	06	881118	18.52	55	67	56			5	308			7.10
03	01	881118	18.52	64	69	31			5	308	04 43 s	110 51 w	3.09
04	01	881118	18.52	69	31	64			5	288	04 43 s	110 54 w	5.56
05	01	881118	18.52	31	64	69	10	01	4	288	04 40 s	111 59 w	9.26
05	02	881118	18.52	67	56	55			4	288			6.17
05	03	881118	18.52	67	56	55	10	02	4	288			3.09
05	04	881118	18.52	56	55	67			4	288			9.26
05	05	881118	18.52	55	67	56			4	288	04 35 s	111 16 w	9.26
05	06	881118	18.52	64	69	31			4	288			6.79
05	07	881118	18.52	64	69	31			4	310	04 32 s	111 27 w	4.01
05	08	881118	18.52	69	31	64	11	03	4	285			6.79
06	01	881118	18.52	31	64	69	11	03	4	285	04 35 s	111 33 w	1.54
01	01	881119	18.52	55	67	56	06	03	4	286	04 14 s	112 48 w	11.11
01	02	881119	18.52	67	56	55	06	03	4	286	04 11 s	112 58 w	10.80

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
01	03	881119	18.52	56	55	67	06	03	4	286			7.72
01	04	881119	18.52	56	55	67	06	02	4	286			3.09
01	05	881119	18.52	69	31	64	06	02	4	286	04 08 s	113 09 w	12.35
01	06	881119	18.52	31	64	69	06	02	4	286	04 06 s	113 17 w	1.23
02	01	881119	18.52	64	69	31			3	286	04 01 s	113 24 w	8.03
02	02	881119	18.52	55	67	56			3	286	04 00 s	113 29 w	12.35
03	01	881119	18.52	67	56	55			3	286	03 55 s	113 39 w	5.25
03	02	881119	18.52	67	56	55			4	286			4.32
03	03	881119	18.52	56	55	67			4	286	03 51 s	113 43 w	9.26
03	04	881119	18.52	69	31	64			4	286	03 51 s	113 49 w	7.72
03	05	881119	18.52	69	31	64	09	01	4	286			4.63
04	01	881119	18.52	31	64	69			4	286			2.78
04	02	881119	18.52	31	64	69	08	01	4	325	03 48 s	113 59 w	2.78
05	01	881119	18.52	55	67	56	09	01	4	325	03 43 s	114 09 w	6.17
05	02	881119	18.52	67	56	55	09	02	4	325			2.78
05	03	881119	18.52	67	56	55	11	02	4	284	03 40 s	114 13 w	3.40
05	04	881119	18.52	56	55	67	11	02	4	284			0.31
06	01	881119	18.52	69	31	64	10	02	4	310	03 42 s	114 11 w	8.33
06	02	881119	18.52	31	64	69	10	02	4	310	03 39 s	114 15 w	9.57
06	03	881119	18.52	64	69	31	10	02	5	310	03 36 s	114 20 w	2.78
07	01	881119	18.52	55	67	56	10	03	5	310	03 35 s	114 24 w	6.17
07	02	881119	18.52	67	56	55	10	03	5	310	03 33 s	114 27 w	8.95
07	03	881119	18.52	56	55	67	10	03	5	310			2.78
07	04	881119	18.52	56	55	67	10	03	5	310	03 29 s	114 33 w	0.62
01	01	881120	18.52	31	64	69			4	279	03 04 s	116 04 w	3.09
01	02	881120	18.52	31	64	69			4	267	03 04 s	116 07 w	2.78
02	01	881120	18.52	31	64	69			4	280	03 04 s	116 10 w	1.54
02	02	881120	18.52	64	69	31			4	280			9.26
02	03	881120	18.52	69	31	64	07	03	4	280			1.54
02	04	881120	18.52	69	31	64			4	280			7.72
02	05	881120	18.52	56	55	67			4	280	03 01 s	116 21 w	3.09
02	06	881120	18.52	56	55	67	06	02	4	280			2.16
02	07	881120	18.52	56	55	67			4	280			4.94
02	08	881120	18.52	56	55	67			4	280			2.16
02	09	881120	18.52	55	67	56			4	280			9.26
02	10	881120	18.52	55	67	56	07	02	4	280			1.85
02	11	881120	18.52	55	67	56			4	280			1.23
02	12	881120	18.52	67	56	55	07	02	4	280			12.35
02	13	881120	18.52	31	64	69	07	01	4	280	02 58 s	116 46 w	12.35
02	14	881120	18.52	64	69	31	07	01	4	280			12.66
02	15	881120	18.52	69	31	64	07	01	4	280			8.95
02	16	881120	18.52	69	31	64	08	01	4	280			1.54
02	17	881120	18.52	56	55	67	08	12	4	280			10.80
02	18	881120	18.52	56	55	67	08	01	4	280			3.09
02	19	881120	18.52	55	67	56	09	01	4	280			6.17
02	20	881120	18.52	55	67	56	10	01	4	280	02 52 s	117 16 w	6.17
02	21	881120	18.52	67	56	55	10	01	4	280			4.94
03	01	881120	18.52	31	64	69	11	01	3	280	02 50 s	117 23 w	4.94
03	02	881120	18.52	31	64	69	10	01	3	310	02 50 s	117 26 w	5.86
03	03	881120	18.52	64	69	31	10	01	3	310			9.26
03	04	881120	18.52	69	31	64	10	01	3	310			1.54
04	01	881120	18.52	69	31	64	10	02	3	310	02 43 s	117 37 w	3.09

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
04	02	881120	18.52	56	55	67	10	02	3	310			9.26
04	03	881120	18.52	55	67	56	10	02	3	310			9.26
04	04	881120	18.52	67	56	55	10	02	3	310	02 35 s	117 47 w	7.72
04	05	881120	18.52	31	64	69	10	02	3	310			4.01
05	01	881120	18.52	31	64	69	10	03	3	310	02 30 s	117 52 w	5.86
05	02	881120	18.52	64	69	31	10	03	3	310			1.85
06	01	881120	18.52	64	69	31	10	03	3	310	02 28 s	117 57 w	4.32
06	02	881120	18.52	64	69	31			3	310			1.85
01	01	881121	18.52	67	56	55			2	270	02 34 s	119 29 w	8.33
01	02	881121	18.52	56	55	67			2	270			4.94
02	01	881121	18.52	55	67	56	07	02	2	270	02 35 s	119 40 w	1.54
02	02	881121	18.52	55	67	56	07	02	1	270			4.63
02	03	881121	18.52	64	69	31	07	02	1	270	02 35 s	119 44 w	12.35
02	04	881121	18.52	69	31	64	07	02	2	270			4.63
03	01	881121	18.52	69	31	64			2	270	02 37 s	119 57 w	3.09
03	02	881121	18.52	31	64	69			2	270	02 37 s	119 55 w	12.35
03	03	881121	18.52	67	56	55	07	01	2	270	02 39 s	120 02 w	7.10
03	04	881121	18.52	67	56	55	06	01	2	300	02 40 s	120 06 w	3.09
03	05	881121	18.52	67	56	55	07	01	2	270	02 39 s	120 08 w	2.16
03	06	881121	18.52	56	55	67	07	01	2	270			8.64
04	01	881121	18.52	55	67	56	08	01	1	270	02 37 s	120 15 w	4.01
05	01	881121	18.52	64	69	31	09	01	1	270	02 39 s	120 17 w	11.42
05	02	881121	18.52	69	31	64	09	01	2	270			1.54
06	01	881121	18.52	69	31	64	09	01	2	270	02 39 s	120 30 w	1.54
07	01	881121	18.52	69	31	64	09	01	2	270	02 39 s	120 27 w	1.54
07	02	881121	18.52	31	64	69	09	01	2	270			10.80
07	03	881121	18.52	67	56	55	09	01	2	270	02 41 s	120 35 w	3.09
07	04	881121	18.52	67	56	55	10	01	3	270			2.16
08	01	881121	18.52	67	56	55	10	01	3	270	02 41 s	120 38 w	6.17
08	02	881121	18.52	56	55	67	11	01	3	270			12.35
08	03	881121	18.52	55	67	56	11	01	3	270			3.09
08	04	881121	18.52	55	67	56	11	02	3	270	02 42 s	120 51 w	9.26
08	05	881121	18.52	64	69	31	10	02	3	310	02 42 s	120 57 w	9.26
08	06	881121	18.52	69	31	64	10	02	3	310	02 38 s	121 02 w	9.26
08	07	881121	18.52	31	64	69	10	02	3	310	02 34 s	121 07 w	7.72
08	08	881121	18.52	67	56	55	10	02	3	310			10.19
08	09	881121	18.52	56	55	67	10	03	3	310	02 29 s	121 14 w	9.26
08	10	881121	18.52	55	67	56	10	03	3	310	02 25 s	121 18 w	6.79
08	11	881121	18.52	55	67	56			3	310			2.16
08	12	881121	18.52	55	67	56			3	310	02 21 s	121 23 w	0.31
01	01	881122	18.52	69	31	64			4	270	02 25 s	122 41 w	9.26
01	02	881122	18.52	31	64	69			4	270	02 25 s	122 46 w	5.86
02	01	881122	18.52	55	67	56			4	270	02 31 s	122 56 w	8.33
02	02	881122	18.52	67	56	55	07	02	4	270			8.33
02	03	881122	18.52	56	55	67	07	02	4	270	02 31 s	123 02 w	3.09
03	01	881122	18.52	56	55	67	07	02	4	270	02 32 s	123 11 w	2.47
03	02	881122	18.52	69	31	64	07	02	4	270			12.35
03	03	881122	18.52	31	64	69	07	01	4	270			12.35
03	04	881122	18.52	64	69	31	08	01	4	270			4.32
04	01	881122	18.52	64	69	31	08	01	4	270	02 33 s	123 32 w	2.47
04	02	881122	18.52	55	67	56	08	01	4	270			4.01
04	03	881122	18.52	55	67	56	07	01	4	295	02 33 s	123 36 w	6.79

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
04	04	881122	18.52	55	67	56	08	01	4	295			3.09
04	05	881122	18.52	67	56	55	08	01	4	295			12.35
04	06	881122	18.52	56	55	67	09	01	4	295			12.35
04	07	881122	18.52	69	31	64	09	01	4	295	02 25 s	123 57 w	12.35
04	08	881122	18.52	31	64	69	10	01	4	295			12.35
04	09	881122	18.52	64	69	31	10	01	4	295			12.35
04	10	881122	18.52	55	67	56	10	02	4	295	02 16 s	124 19 w	9.26
04	11	881122	18.52	67	56	55	10	02	4	295			9.26
04	12	881122	18.52	56	55	67	10	02	4	295			8.64
04	13	881122	18.52	69	31	64	10	02	4	295			9.88
04	14	881122	18.52	31	64	69	10	02	4	295	02 08 s	124 44 w	3.09
04	15	881122	18.52	31	64	69			4	295			6.17
04	16	881122	18.52	64	69	31			4	295			1.23
04	17	881122	18.52	64	69	31	10	03	4	295			8.64
01	01	881123	18.52	56	55	67			4	267	02 09 s	126 31 w	6.79
01	02	881123	18.52	56	55	67	07	03	4	267	02 10 s	126 36 w	4.94
01	03	881123	18.52	55	67	56			4	267	02 10 s	126 39 w	2.78
01	04	881123	18.52	55	67	56	07	03	4	267			1.85
01	05	881123	18.52	55	67	56			4	267	02 10 s	126 42 w	2.47
01	06	881123	18.52	55	67	56	07	03	4	267			5.25
01	07	881123	18.52	67	56	55	07	02	4	267			11.42
01	08	881123	18.52	31	64	12	07	02	4	267	02 11 s	126 54 w	12.04
01	09	881123	18.52	64	12	31	07	02	4	267			12.35
01	10	881123	18.52	12	31	64	07	02	4	267			12.35
01	11	881123	18.52	56	55	67	07	01	4	267	02 13 s	127 17 w	12.35
01	12	881123	18.52	55	67	56	08	01	4	267			12.35
01	13	881123	18.52	67	56	55	08	01	4	267			6.17
01	14	881123	18.52	67	56	55	09	01	4	267			6.17
01	15	881123	18.52	31	64	12	09	01	4	267	02 15 s	127 40 w	3.09
02	01	881123	18.52	31	64	12	10	01	4	267	02 15 s	127 44 w	2.78
02	02	881123	18.52	64	12	31	10	01	4	267			10.49
02	03	881123	18.52	12	31	64	11	01	4	267			3.09
02	04	881123	18.52	12	31	64	11	01	4	270	02 20 s	127 58 w	9.26
02	05	881123	18.52	56	55	67	11	01	4	270	02 17 s	128 01 w	9.26
02	06	881123	18.52	56	55	67	10	01	4	290	02 17 s	128 07 w	2.47
02	07	881123	14.82	56	55	67	10	01	4	290			0.49
02	08	881123	14.82	55	67	56	10	01	4	290			1.98
02	09	881123	12.04	55	67	56	10	01	4	290	02 16 s	128 10 w	5.42
02	10	881123	12.04	55	67	56	06	01	4	062	02 14 s	128 15 w	1.00
02	11	881123	12.04	67	56	55	06	02	4	062			3.21
02	12	881123	12.04	67	56	55			4	062			1.81
02	13	881123	12.04	67	56	55			4	062			0.80
02	14	881123	18.52	67	56	55	06	02	4	062	02 11 s	128 09 w	3.40
02	15	881123	18.52	31	64	12	06	02	4	062	02 10 s	128 07 w	9.26
02	16	881123	18.52	64	12	31	06	02	4	062	02 07 s	128 02 w	3.70
02	17	881123	18.52	64	12	31			4	062			5.56
02	18	881123	18.52	12	31	64	06	02	4	062	02 07 s	128 01 w	4.01
03	01	881123	18.52	56	55	67	06	03	4	062	02 02 s	127 56 w	1.85
03	02	881123	18.52	56	55	67	06	03	4	062			2.78
04	01	881123	18.52	55	67	56			4	062	02 00 s	127 52 w	0.62
05	01	881123	18.52	55	67	56			4	062	02 00 s	127 51 w	2.47
05	02	881123	18.52	55	67	56			4	062	01 59 s	127 50 w	0.31

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	observer codes right	observer codes rec.	sun position horz.	sun position vert.	beauf. no.	course (deg.)	position latitude	position longitude	km in leg
01	01	881124	18.52	64	69	31			5	070	01 28 s	127 00 w	10.80
01	02	881124	18.52	69	31	64			5	070			3.09
01	03	881124	18.52	69	31	64	02	03	5	070			8.33
01	04	881124	18.52	31	64	69	02	03	5	070			10.19
01	05	881124	18.52	67	56	55	01	02	5	070	01 21 s	126 50 w	4.63
01	06	881124	18.52	67	56	55			5	070			1.54
01	07	881124	18.52	67	56	55	01	02	5	070			6.17
01	08	881124	18.52	56	55	67	01	02	5	070			12.04
02	01	881124	18.52	55	67	56	02	02	5	070	01 16 s	126 39 w	2.47
02	02	881124	18.52	55	67	56	02	01	5	070			9.26
02	03	881124	18.52	64	69	31	02	01	5	070			2.78
03	01	881124	18.52	64	69	31	02	01	5	064	01 15 s	126 31 w	5.86
03	02	881124	18.52	69	31	64	02	01	5	064			12.35
03	03	881124	18.52	31	64	69	03	01	5	064			12.35
03	04	881124	18.52	67	56	55	04	01	5	064	01 08 s	126 22 w	6.17
03	05	881124	18.52	56	55	67	04	01	4	064			6.17
03	06	881124	18.52	55	67	56	05	01	4	064			3.09
03	07	881124	18.52	55	67	56	05	01	5	064			3.09
04	01	881124	18.52	64	69	31	06	01	4	064	00 59 s	126 06 w	12.35
04	02	881124	18.52	69	31	64	06	01	4	064			1.23
05	01	881124	18.52	69	31	64	06	01	4	064	00 56 s	126 02 w	8.03
05	02	881124	18.52	31	64	69	06	02	4	064			12.35
05	03	881124	18.52	67	56	55	06	02	4	064			9.26
05	04	881124	18.52	56	55	67	06	02	4	064			9.26
05	05	881124	18.52	55	67	56	06	03	4	064	00 46 s	125 45 w	9.26
05	06	881124	18.52	64	69	31	06	03	4	064			6.17
05	07	881124	18.52	69	31	64	06	03	4	064			6.79
01	01	881125	18.52	69	31	64			1	000	00 09 s	124 27 w	4.01
02	01	881125	18.52	31	64	69			2	000	00 03 s	124 23 w	7.10
02	02	881125	18.52	64	69	31	04	02	2	000			3.40
02	03	881125	18.52	64	69	31			2	000			4.32
02	04	881125	18.52	55	67	56			2	000	00 05 n	124 24 w	7.72
02	05	881125	18.52	55	67	56	05	01	2	000			1.54
02	06	881125	18.52	55	67	56			2	000	00 10 n	124 24 w	3.09
02	07	881125	18.52	67	56	55	05	01	2	000	00 12 n	124 24 w	0.93
03	01	881125	18.52	67	56	55			2	000	00 15 n	124 25 w	3.09
03	02	881125	18.52	67	56	55	05	01	2	000			2.16
03	03	881125	18.52	56	55	67	05	01	3	000			9.26
03	04	881125	18.52	56	55	67	06	01	3	000	00 23 n	124 26 w	3.09
03	05	881125	18.52	69	31	64	06	01	3	000	00 24 n	124 26 w	1.23
04	01	881125	18.52	31	64	69	07	01	3	000	00 29 n	124 29 w	9.26
04	02	881125	18.52	64	69	31	07	01	3	000			6.17
05	01	881125	18.52	55	67	56	08	01	3	000	00 35 n	124 30 w	1.23
06	01	881125	18.52	67	56	55	08	02	3	000	00 45 n	124 32 w	10.49
06	02	881125	18.52	56	55	67	08	02	3	000			10.49
06	03	881125	18.52	69	31	64	08	02	3	000	00 57 n	124 35 w	9.26
06	04	881125	18.52	31	64	69	08	02	3	000	01 02 n	124 36 w	6.79
07	01	881125	18.52	64	69	31	08	03	3	000	01 06 n	124 37 w	8.95
07	02	881125	18.52	55	67	56	08	03	4	000			4.01
07	03	881125	18.52	55	67	56	08	03	4	000	01 13 n	124 39 w	0.31
01	01	881126	17.59	31	64	69	03	03	4	025	02 45 n	124 37 w	10.56
01	02	881126	17.59	64	69	31	03	03	4	025			9.97

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
01	03	881126	17.59	69	31	64	03	02	4	025			10.26
01	04	881126	18.52	56	55	67	03	02	4	025	03 02 n	124 32 w	12.35
01	05	881126	18.52	55	67	56	03	02	4	025			7.72
01	06	881126	18.52	55	67	56			4	025			4.63
01	07	881126	18.52	67	56	55			4	025			2.47
02	01	881126	18.52	67	56	55	04	01	4	020	03 15 n	124 31 w	6.17
02	02	881126	18.52	31	64	69	04	01	4	020			13.27
02	03	881126	18.52	64	69	31	04	01	4	020			7.72
03	01	881126	18.52	69	31	64	05	01	4	020	03 33 n	124 28 w	4.32
03	02	881126	18.52	56	55	67	05	01	4	020			1.23
03	03	881126	18.52	56	55	67	05	01	4	020			12.04
03	04	881126	18.52	55	67	56	06	01	4	020			4.01
03	05	881126	18.52	55	67	56			4	020			1.85
03	06	881126	18.52	55	67	56	06	01	4	020	03 46 n	124 27 w	6.17
04	01	881126	18.52	67	56	55	07	01	4	020	03 50 n	124 25 w	1.85
05	01	881126	18.52	31	64	69			4	020	03 54 n	124 30 w	3.40
05	02	881126	18.52	31	64	69	07	01	4	020			7.10
05	03	881126	18.52	64	69	31			3	020			6.48
06	01	881126	18.52	64	69	31	07	02	3	020	04 05 n	124 31 w	1.85
06	02	881126	18.52	69	31	64	07	02	3	020			2.16
07	01	881126	18.52	56	55	67	07	02	3	020	04 13 n	124 31 w	6.17
08	01	881126	18.52	55	67	56			3	020	04 17 n	124 25 w	4.63
08	02	881126	18.52	31	64	69			3	020			9.26
01	01	881127	18.52	67	56	55			3	013	06 00 n	124 23 w	10.80
01	02	881127	18.52	56	55	67			3	013			9.57
02	01	881127	18.52	55	67	56			3	013	06 17 n	124 15 w	2.16
02	02	881127	18.52	64	69	31			3	013	06 18 n	124 15 w	3.09
03	01	881127	18.52	64	69	31			3	013	06 20 n	124 14 w	4.32
04	01	881127	18.52	69	31	64			3	012	06 23 n	124 11 w	4.32
05	01	881127	18.52	69	31	64			3	012	06 26 n	124 10 w	3.09
05	02	881127	18.52	31	64	69			3	012			3.09
05	03	881127	18.52	31	64	69	04	02	3	012	06 29 n	124 10 w	9.26
05	04	881127	18.52	67	56	55	04	01	3	012	06 33 n	124 08 w	12.35
05	05	881127	18.52	56	55	67			3	012			8.95
06	01	881127	18.52	55	67	56			3	012	06 44 n	124 03 w	3.09
06	02	881127	18.52	55	67	56			4	012	06 46 n	124 03 w	2.16
06	03	881127	18.52	55	67	56			4	006	06 47 n	124 02 w	7.10
06	04	881127	18.52	64	69	31			3	006	06 50 n	124 01 w	8.33
06	05	881127	18.52	64	69	31			3	006	06 55 n	124 00 w	4.01
06	06	881127	18.52	69	31	64			3	006			0.93
07	01	881127	18.52	64	31	69			3	006	07 01 n	123 59 w	2.47
07	02	881127	18.52	69	31	64			3	006			2.16
07	03	881127	18.52	04	31	64			3	006	07 03 n	123 58 w	0.93
08	01	881127	18.52	31	64	69			3	006	07 04 n	123 58 w	4.32
09	01	881127	18.52	67	56	55			3	006	07 08 n	123 57 w	5.86
09	02	881127	18.52	67	56	55	07	01	3	006	07 10 n	123 59 w	5.56
09	03	881127	18.52	56	55	67			3	006			1.85
10	01	881127	18.52	56	55	67			3	006	07 17 n	123 57 w	4.01
10	02	881127	18.52	55	67	56			3	006			2.16
10	03	881127	18.52	55	67	56			3	006	07 20 n	123 56 w	3.70
11	01	881127	18.52	64	69	31			3	006	07 29 n	123 54 w	1.85
01	01	881128	18.52	69	31	64			4	005	10 08 n	123 20 w	2.47

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
02	01	881128	18.52	31	64	69			5	005	10 11 n	123 18 w	4.01
03	01	881128	18.52	64	69	31	08	02	4	005	10 17 n	123 19 w	4.32
03	02	881128	18.52	55	67	56	08	02	4	005			9.26
03	03	881128	18.52	67	56	55	08	02	4	005			9.26
03	04	881128	18.52	56	55	67	08	03	4	005	10 28 n	123 18 w	6.17
03	05	881128	18.52	56	55	67			4	005			0.93
03	06	881128	18.52	69	31	64	08	03	4	005			6.48
01	01	881129	18.52	56	55	67			4	020	12 13 n	122 57 w	10.49
01	02	881129	18.52	55	67	56			4	020			4.32
01	03	881129	18.52	55	67	56	03	03	4	020			4.32
02	01	881129	18.52	67	56	55	03	02	4	020	12 24 n	122 52 w	10.49
02	02	881129	18.52	31	64	69	03	02	4	020	12 30 n	122 52 w	12.35
02	03	881129	18.52	64	69	31	03	02	4	020	12 35 n	122 49 w	4.94
03	01	881129	18.52	64	69	31	04	02	3	020	12 38 n	122 48 w	2.78
03	02	881129	18.52	69	31	64	04	02	3	020			6.17
03	03	881129	18.52	69	31	64	04	02	3	020			3.09
04	01	881129	18.52	69	31	64	04	02	3	020	12 44 n	122 46 w	1.54
04	02	881129	18.52	56	55	67	04	02	3	020	12 44 n	122 46 w	3.70
05	01	881129	18.52	56	55	67	04	01	3	020	12 46 n	122 45 w	7.10
05	02	881129	18.52	55	67	56	05	01	4	020			6.17
05	03	881129	18.52	55	67	56	05	01	4	013	12 53 n	122 42 w	6.17
05	04	881129	18.52	67	56	55	05	01	4	013			11.42
05	05	881129	18.52	31	64	69	06	01	4	013	13 01 n	122 40 w	4.01
06	01	881129	18.52	31	64	69	06	01	5	013	13 03 n	122 41 w	2.47
06	02	881129	18.52	64	69	31	06	01	5	013			11.73
06	03	881129	18.52	69	31	64	06	01	5	013			9.26
06	04	881129	18.52	69	31	64	06	01	4	013			3.09
06	05	881129	18.52	56	55	67	06	01	4	013	13 19 n	122 40 w	8.33
06	06	881129	18.52	56	55	67	07	02	4	013	13 24 n	122 40 w	4.01
06	07	881129	18.52	55	67	56	07	02	4	013			4.63
06	08	881129	18.52	55	67	56			4	013			1.54
06	09	881129	18.52	55	67	56	07	02	4	013	13 29 n	122 40 w	1.54
06	10	881129	18.52	55	67	56	07	02	4	020	13 29 n	122 40 w	4.63
06	11	881129	18.52	67	56	55	07	02	4	020			4.32
06	12	881129	18.52	67	56	55	07	02	4	020			1.85
06	13	881129	18.52	67	56	55	07	02	4	020			4.63
06	14	881129	18.52	67	56	55			4	020			1.54
06	15	881129	18.52	31	64	69			5	020	13 39 n	122 38 w	9.26
06	16	881129	18.52	64	69	31	07	03	5	020	13 41 n	122 35 w	3.40
06	17	881129	18.52	64	69	31			5	020			2.16
06	18	881129	18.52	64	69	31			5	020	13 44 n	122 34 w	0.31
01	01	881130	18.52	64	69	31	07	02	4	016	16 44 n	121 55 w	10.19
01	02	881130	18.52	69	31	64	07	02	4	016			9.26
01	03	881130	18.52	67	56	55	08	02	4	016	16 53 n	121 51 w	7.72
01	04	881130	18.52	56	55	67			4	016			0.62
02	01	881130	18.52	56	55	67			4	016	16 58 n	121 51 w	2.16
02	02	881130	18.52	55	67	56			4	016			7.72
02	03	881130	18.52	55	67	56			4	016	17 03 n	121 49 w	0.31
01	01	881201	18.52	55	67	56	03	03	2	013	18 49 n	121 26 w	4.01
02	01	881201	18.52	67	56	55	03	03	2	013	18 52 n	121 26 w	9.57
02	02	881201	18.52	56	55	67	03	02	2	013	18 56 n	121 26 w	9.57
02	03	881201	18.52	69	31	64	03	02	2	013	19 01 n	121 25 w	9.26

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
02	04	881201	18.52	69	31	64			2	013	19 06 n	121 24 w	3.09
02	05	881201	18.52	31	64	69			2	013			12.35
02	06	881201	18.52	64	69	31			2	013			3.40
02	07	881201	18.52	64	69	31			2	030	19 15 n	121 21 w	2.47
02	08	881201	18.52	64	69	31	04	02	2	030	19 17 n	121 20 w	6.48
02	09	881201	18.52	55	67	56	04	02	2	030	19 20 n	121 19 w	9.26
02	10	881201	18.52	55	67	56	04	01	2	030	19 24 n	121 16 w	3.09
02	11	881201	18.52	67	56	55	04	01	2	030	19 26 n	121 15 w	12.35
02	12	881201	18.52	56	55	67	04	01	2	030			12.35
02	13	881201	18.52	69	31	64	05	01	2	030	19 37 n	121 08 w	12.35
02	14	881201	18.52	31	64	69			2	030			5.25
03	01	881201	18.52	64	69	31			2	030	19 49 n	121 08 w	7.72
03	02	881201	18.52	55	67	56			2	030	19 51 n	121 04 w	2.16
04	01	881201	18.52	55	67	56			2	030	19 55 n	121 04 w	9.88
04	02	881201	18.52	67	56	55			1	030	19 59 n	121 01 w	1.23
05	01	881201	18.52	56	55	67			1	030	20 01 n	121 00 w	6.17
06	01	881201	18.52	69	31	64			1	030	20 02 n	120 50 w	4.32
07	01	881201	18.52	31	64	69			1	030	20 05 n	120 46 w	5.56
07	02	881201	18.52	31	64	69			1	030	20 08 n	120 44 w	0.31
01	01	881202	18.52	31	64	69			1	030	21 39 n	119 51 w	4.63
01	02	881202	18.52	31	64	69	03	03	1	030			2.47
02	01	881202	18.52	64	69	31	03	02	1	030	21 46 n	119 43 w	3.40
02	02	881202	18.52	56	55	67	03	02	1	030			12.35
02	03	881202	18.52	55	67	56	03	02	1	030			6.17
02	04	881202	18.52	55	67	56	04	02	1	030	21 56 n	119 30 w	6.17
02	05	881202	18.52	67	56	55	04	02	0	030			12.35
02	06	881202	18.52	31	64	69	04	02	1	030	22 05 n	119 31 w	12.35
02	07	881202	18.52	64	69	31	04	02	1	030			4.63
02	08	881202	18.52	64	69	31	04	02	1	052	22 13 n	119 25 w	3.40
03	01	881202	18.52	56	55	67	05	02	1	030	22 15 n	119 24 w	3.09
03	02	881202	18.52	56	55	67	05	02	0	030			2.78
04	01	881202	18.52	56	55	67	05	02	0	030	22 19 n	119 20 w	1.85
04	02	881202	18.52	55	67	56	06	02	0	030			4.32
05	01	881202	18.52	55	67	56	06	02	0	030	22 23 n	119 19 w	2.47
05	02	881202	18.52	67	56	55	06	02	0	030			3.70
06	01	881202	18.52	31	64	69	06	02	1	030	22 23 n	119 11 w	6.17
06	02	881202	18.52	31	64	69	07	02	1	030			4.94
06	03	881202	18.52	64	69	31	07	02	1	030	22 28 n	119 09 w	1.85
01	01	881203	18.52	67	56	55	03	03	2	027	24 18 n	118 09 w	2.16
01	02	881203	18.52	67	56	55	03	03	3	027			7.41
01	03	881203	18.52	56	55	67	03	03	3	027	24 22 n	118 07 w	1.54
02	01	881203	18.52	55	67	56	03	02	4	027	24 21 n	118 02 w	5.56
02	02	881203	18.52	64	69	31	03	02	3	027	24 24 n	118 00 w	8.33
03	01	881203	18.52	69	31	64	03	02	3	030	24 33 n	117 58 w	7.72
03	02	881203	18.52	31	64	69	04	02	3	036	24 37 n	117 55 w	5.56
03	03	881203	18.52	31	64	69	04	02	3	034	24 38 n	117 53 w	0.62
04	01	881203	18.52	67	56	55	04	02	3	034	24 38 n	117 52 w	4.63
04	02	881203	18.52	67	56	55	05	02	3	030	24 39 n	117 50 w	6.17
04	03	881203	18.52	56	55	67	05	02	3	030			10.80
04	04	881203	18.52	55	67	56	05	02	3	030	24 49 n	117 45 w	7.10
05	01	881203	18.52	55	67	56	05	02	3	030	24 53 n	117 42 w	2.16
05	02	881203	18.52	64	69	31	05	02	3	030	24 54 n	117 42 w	12.66

Table 2. (continued)

series	leg	date	speed km/hr	observer codes left	right	rec.	sun position horz.	vert.	beauf. no.	course (deg.)	position latitude	longitude	km in leg
													12.04
05	03	881203	18.52	69	31	64	06	02	3	030			12.35
05	04	881203	18.52	31	64	69	06	02	3	030			12.35
05	05	881203	18.52	67	56	55	06	02	3	030	25 12 n	117 31 w	3.09
05	06	881203	18.52	56	55	67	07	02	3	030			3.40
06	01	881203	18.52	56	55	67	07	02	3	030	25 24 n	117 27 w	2.47
06	02	881203	18.52	55	67	56	07	02	3	030			5.56
06	03	881203	18.52	55	67	56	07	03	3	030	25 28 n	117 25 w	3.70
06	04	881203	18.52	55	67	56	07	03	4	030			4.01
07	01	881203	18.52	64	69	31	07	03	4	030	25 32 n	117 20 w	

total distance travelled on effort: 13389.61 km.

Table 3. Marine mammal sightings, classified by species code groups, enountered in the eastern tropical Pacific aboard the McArthur during July 28 through December 6, 1988.

Sightings by Species

species: OFFSHORE SPOTTED DOLPHIN (STENELLA ATTENUATA) species code: 2

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
880730	04	01	03	12	01	1	70	1.1	27 11 n	121 27 w	100.0	86.0	69.0
880730	05	02	04	03	01	1	68	1.8	27 03 n	121 23 w	100.0	230.0	168.0
880731	03	02	02			1	51	0.9	24 21 n	120 26 w	100.0	67.0	54.0
880801	03	03	02			4	05	6.0	19 43 n	118 53 w	100.0	223.0	184.0
880802	01	02	01			4	68	0.4	17 49 n	118 18 w	100.0	121.0	88.0
880803	05	01	07			3	51	0.8	13 55 n	118 10 w	30.0	93.0	78.0
880810	01	03	01			5	51	0.7	06 19 n	114 39 w	70.0	129.0	95.0
880810	07	02	08	10	02	5	70	0.6	06 59 n	115 44 w	100.0	160.0	117.0
880816	04	02	04			2	70	2.5	12 57 n	130 16 w	9.5	364.0	319.0
880818	02	01	01			1	68	0.0	11 33 n	133 54 w	63.3	260.0	200.0
880818	02	01	02			1	51	0.0	11 33 n	133 54 w	100.0	31.0	23.0
880904	02	01	02	10	03	3	68	0.7	10 01 n	147 00 w	63.3	128.0	110.0
880904	02	01	03	10	03	3	38	2.7	10 01 n	147 00 w	21.7	233.0	183.0
880907			01			6	68	0.1	04 58 n	137 19 w	50.0	225.0	170.0
880909	04	02	02	08	02	3	68	0.8	06 23 n	130 23 w	48.3	247.0	195.0
880914	02	07	01			5	68	4.7	04 14 n	118 21 w	79.3	77.0	58.0
880914	03	08	03			5	38	0.5	04 18 n	117 46 w	20.0	80.0	52.0
880916	03	02	03	12	02	4	51	2.7	04 42 n	112 33 w	60.0	157.0	251.0
880916	06	01	04			4	05	0.9	04 53 n	111 45 w	26.7	300.0	217.0
880919	03	06	02			4	68	2.0	03 30 n	102 24 w	100.0	150.0	87.0
881014	02	01	01			4	69	0.5	02 14 n	093 30 w	95.0	247.0	165.0
881014	03	01	02	04	02	4	55	1.4	02 20 n	093 35 w	31.7	292.0	257.0
881014	08	05	06	09	01	5	56	1.1	03 03 n	093 56 w	100.0	45.0	35.0
881020	02	03	02	12	03	3	55	5.9	02 57 s	099 32 w	9.6	891.0	799.0
881110	03	04	06			4	31	1.5	09 33 s	085 49 w	55.0	163.0	142.0
881110	04	04	08	09	12	3	55	3.1	09 27 s	086 05 w	100.0	387.0	340.0
881116	01	05	03			4	56	3.6	05 16 s	104 15 w	3.0	175.0	152.0
881125	01	01	01			1	31	3.4	00 07 s	124 27 w	100.0	412.0	382.0
881125	02	07	02	05	01	2	67	0.8	00 12 n	124 24 w	100.0	223.0	212.0
881126	04	01	05	07	01	4	67	3.3	03 50 n	124 25 w	78.3	188.0	157.0
881126	06	02	07	07	02	3	69	2.1	04 07 n	124 31 w	65.7	1330.0	1100.0
881127	11	01	10			3	64	0.5	07 29 n	123 54 w	97.3	0.0*	660.0
881201	01	01	01	03	03	2	67	0.3	18 51 n	121 25 w	100.0	238.0	212.0
881201	05	01	04			1	55	2.9	20 04 n	120 58 w	100.0	132.0	121.0
881202	05	02	03	06	02	0	56	5.6	22 24 n	119 16 w	100.0	102.0	90.0

Table 3. (continued)

Sightings by Species

species: SPINNER DOLPHIN (STENELLA LONGIROSTRIS) species code: 3

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
881014	02	01	01			4	69	0.5	02 14 n	093 30 w	5.0	247.0	165.0
881127	11	01	10			3	64	0.5	07 29 n	123 54 w	2.7	0.0*	660.0

Table 3. (continued)

Sightings by Species

species: COMMON DOLPHIN (DELPHINUS DELPHIS) species code: 5

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
880730	01	10	01			1	05	3.8	27 41 n	121 35 w	100.0	20.0	15.0
880804	02	16	01	05	02	3	70	0.0	11 46 n	116 16 w	100.0	57.0	49.0
880923			01			3	38	3.0	00 04 n	092 56 w	100.0	0.0*	150.0
880923	03	01	03	12	12	3	70	2.6	00 06 s	092 57 w	100.0	455.0	400.0
881008	02	08	03			5	55	0.2	04 22 n	082 43 w	100.0	98.0	87.0
881010	03	08	04			5	55	4.4	07 00 n	086 15 w	100.0	800.0	716.0
881017	01	01	01			1	31	2.1	00 04 n	100 18 w	100.0	800.0	533.0
881017	02	01	05			1	64	0.7	00 03 n	100 29 w	100.0	76.0	65.0
881017	03	03	06	08	02	1	55	4.3	00 06 s	100 39 w	100.0	16.0	14.0
881017	05	01	08			2	69	3.4	00 15 s	100 46 w	100.0	380.0	332.0
881017	09	04	14	01	02	3	69	0.4	00 38 s	101 22 w	100.0	78.0	63.0
881017	10	02	15			4	55	3.8	00 41 s	101 31 w	100.0	88.0	73.0
881017	11	01	16			3	56	3.8	00 39 s	101 32 w	100.0	29.0	24.0
881018	02	04	02			3	69	0.1	01 49 s	103 00 w	100.0	5.0	5.0
881018	04	01	05			3	67	2.0	01 50 s	103 09 w	100.0	208.0	162.0
881018	07	03	09	09	12	3	64	0.3	02 02 s	103 24 w	100.0	407.0	357.0
881018	12	01	15	03	02	3	64	6.9	02 35 s	103 49 w	100.0	217.0	188.0
881020	07	01	07	05	01	4	31	1.1	02 45 s	098 45 w	100.0	2550.0	2317.0
881020	10	02	11	06	03	2	55	2.6	02 45 s	098 09 w	100.0	0.0*	233.0
881021	03	05	03			2	64	0.2	02 48 s	096 33 w	100.0	22.0	19.0
881021	04	03	05			4	69	1.3	02 49 s	096 26 w	100.0	9.0	8.0
881026	01	05	02			3	64	0.7	03 50 s	087 58 w	98.7	1400.0	1233.0
881027	01	02	01			3	69	3.7	02 59 s	085 24 w	100.0	1650.0	1500.0
881027	03	01	03	10	02	3	67	1.3	03 04 s	085 28 w	100.0	767.0	708.0
881027	04	01	04	10	02	3	55	2.2	03 08 s	085 28 w	100.0	408.0	377.0
881027	09	01	12	03	01	4	31	0.8	03 36 s	085 06 w	100.0	140.0	127.0
881027	13	02	15	03	02	3	55	7.1	03 52 s	084 55 w	100.0	3537.0	3150.0
881110	01	06	03	06	02	4	67	3.1	09 47 s	085 33 w	100.0	257.0	237.0
881204			02	03	02	3	31	4.8	27 37 n	115 00 w	40.0	250.0	225.0
881205			01	04	02	1	04	4.4	30 06 n	116 03 w	100.0	1000.0	850.0

Table 3. (continued)

Sightings by Species

species: EASTERN SPINNER DOLPHIN (STENELLA LONGIROSTRIS) species code: 10

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
880803	05	01	07			3	51	0.8	13 55 n	118 10 w	70.0	93.0	78.0
881014	03	01	02	04	02	4	55	1.4	02 20 n	093 35 w	68.3	292.0	257.0

Table 3. (continued)

Sightings by Species

species: WHITEBELLY SPINNER DOLPHIN (STENELLA LONGIROSTRIS) species code: 11

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
880810	01	03	01			5	51	0.7	06 19 n	114 39 w	30.0	129.0	95.0
880815			05	10	02	4	70	0.1	13 20 n	127 53 w	53.7	69.0	44.0
880815	01	01	01	05	03	4	68	3.8	12 24 n	126 28 w	100.0	74.0	57.0
880816	01	08	02			1	68	0.2	13 22 n	129 25 w	100.0	132.0	115.0
880816	04	02	04			2	70	2.5	12 57 n	130 16 w	73.8	364.0	319.0
880816	08	01	09	01	01	2	05	2.9	12 52 n	130 34 w	100.0	65.0	53.0
880817	01	01	01			3	38	5.1	13 36 n	131 41 w	100.0	37.0	29.0
880817	03	10	02	12	12	5	22	0.0	12 58 n	132 19 w	100.0	15.0	11.0
880817	04	04	03	12	01	5	38	0.6	12 47 n	132 25 w	100.0	43.0	33.0
880817	05	08	04			3	05	4.5	12 31 n	132 41 w	28.0	68.0	52.0
880818	02	01	01			1	68	0.0	11 33 n	133 54 w	36.7	260.0	200.0
880818	07	02	06	02	01	2	05	1.2	10 55 n	134 47 w	100.0	167.0	153.0
880822	04	01	04			3	68	1.5	12 53 n	143 54 w	100.0	43.0	37.0
880903	02	15	02			4	51	0.7	11 40 n	148 30 w	100.0	144.0	105.0
880904	01	02	01	10	03	4	70	1.5	10 04 n	147 08 w	100.0	151.0	124.0
880904	02	01	02	10	03	3	68	0.7	10 01 n	147 00 w	36.7	128.0	110.0
880904	02	01	03	10	03	3	38	2.7	10 01 n	147 00 w	45.0	233.0	183.0
880904	05	04	08	04	02	2	51	1.6	08 54 n	146 03 w	100.0	0.0*	6.0
880907			01			6	68	0.1	04 58 n	137 19 w	50.0	225.0	170.0
880909	04	02	02	08	02	3	68	0.8	06 23 n	130 23 w	51.7	247.0	195.0
880914	03	08	03			5	38	0.5	04 18 n	117 46 w	80.0	80.0	52.0
880916	03	02	03	12	02	4	51	2.7	04 42 n	112 33 w	40.0	157.0	251.0
880916	06	01	04			4	05	0.9	04 53 n	111 45 w	6.7	300.0	217.0
881020	02	03	02	12	03	3	55	5.9	02 57 s	099 32 w	90.4	891.0	799.0
881110	03	04	06			4	31	1.5	09 33 s	085 49 w	11.7	163.0	142.0
881116	01	05	03			4	56	3.6	05 16 s	104 15 w	51.3	175.0	152.0
881118	02	06	03			5	55	0.2	04 44 s	110 51 w	58.3	353.0	310.0
881126	04	01	05	07	01	4	67	3.3	03 50 n	124 25 w	21.7	188.0	157.0
881126	06	02	07	07	02	3	69	2.1	04 07 n	124 31 w	1.0	1330.0	1100.0

Table 3. (continued)

Sightings by Species

species: STRIPED DOLPHIN (S. COERULEOALBA) species code: 13

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
880730	02	02	02			1	68	5.3	27 42 n	121 34 w	100.0	38.0	31.0
880731	01	01	01			1	22	1.0	24 33 n	120 33 w	100.0	21.0	13.0
880801	01	10	01			5	38	0.0	20 42 n	119 11 w	100.0	34.0	25.0
880807	01	03	01			6	70	0.2	06 37 n	109 59 w	100.0	2.0	2.0
880808	02	01	02			3	38	1.8	04 39 n	109 23 w	100.0	20.0	36.0
880809	01	04	02	05	02	3	05	0.1	05 20 n	111 55 w	100.0	21.0	16.0
880810	04	02	04	12	12	5	68	1.8	06 32 n	116 17 w	100.0	60.0	45.0
880813	02	07	03			5	38	5.1	09 58 n	122 35 w	100.0	31.0	29.0
880815			05	10	02	4	70	0.1	13 20 n	127 53 w	21.3	69.0	44.0
880816	05	01	05			2	05	1.5	12 56 n	130 26 w	90.0	10.0	10.0
880816	09	01	10			2	51	1.2	12 50 n	130 38 w	100.0	45.0	35.0
880816	10	06	11			2	22	0.2	13 07 n	130 51 w	100.0	35.0	29.0
880817	05	08	04			3	05	4.5	12 31 n	132 41 w	72.0	68.0	52.0
880818	03	03	03	08	02	2	05	7.7	11 21 n	134 08 w	100.0	133.0	95.0
880818	04	03	05	08	01	3	38	1.8	11 16 n	134 21 w	100.0	96.0	73.0
880910	01	02	02	02	03	1	05	0.9	07 48 n	128 48 w	100.0	212.0	127.0
880910	02	04	04	11	02	1	38	0.7	07 48 n	128 32 w	100.0	34.0	27.0
880910	03	01	05	11	01	1	68	1.1	07 46 n	128 28 w	100.0	28.0	22.0
880910	06	02	07	12	12	1	05	0.4	07 37 n	128 13 w	100.0	8.0	7.0
880910	07	02	08	12	12	1	68	0.1	07 29 n	128 04 w	100.0	70.0	50.0
880910	08	01	09	04	01	1	51	0.6	07 24 n	127 57 w	100.0	105.0	82.0
880919	01	01	01			5	38	0.0	03 40 n	103 34 w	100.0	97.0	67.0
880926	03	01	02	01	02	4	38	0.2	01 00 s	088 33 w	100.0	97.0	72.0
880926	05	01	05			5	05	0.7	00 41 s	088 09 w	100.0	53.0	42.0
880927	02	09	04			3	05	1.4	00 41 n	084 35 w	94.3	75.0	72.0
880928			09	08	02	4	99	0.1	03 25 n	081 48 w	100.0	5.0	4.0
880928	02	04	03			4	68	4.2	02 19 n	082 18 w	100.0	72.0	60.0
880928	03	01	06			4	51	0.3	02 22 n	082 14 w	100.0	9.0	7.0
880928	05	04	10	08	02	4	51	2.2	03 34 n	081 43 w	100.0	48.0	41.0
881005	01	03	02	02	03	4	31	2.7	05 13 n	080 06 w	100.0	50.0	45.0
881005	02	03	03			4	56	5.3	05 05 n	080 09 w	89.0	0.0*	62.0
881007	02	01	02			4	64	3.1	01 36 n	081 02 w	100.0	16.0	15.0
881007	03	04	04			4	55	2.5	01 47 n	081 09 w	100.0	40.0	32.0
881007	05	06	06	09	01	4	69	2.7	02 28 n	081 39 w	100.0	30.0	20.0
881008	01	02	02			4	67	1.4	03 58 n	082 33 w	100.0	175.0	152.0
881008	03	16	05			4	64	4.0	04 56 n	083 24 w	100.0	35.0	30.0
881009	03	14	05			5	55	1.0	03 45 n	085 28 w	100.0	208.0	178.0
881009	04	03	07	09	01	4	64	2.1	03 59 n	085 32 w	100.0	45.0	33.0
881013	05	08	03			4	69	2.1	01 21 n	092 27 w	100.0	72.0	62.0
881014	07	02	05			5	64	0.5	02 50 n	093 48 w	100.0	56.0	42.0
881017	03	03	07	08	02	1	55	3.1	00 06 s	100 39 w	100.0	77.0	65.0
881017	06	04	10	10	12	3	55	1.6	00 27 s	100 58 w	100.0	97.0	85.0
881018	03	01	04			3	31	5.2	01 50 s	103 04 w	100.0	28.0	25.0

Table 3. (continued)

Sightings by Species

species: STRIPED DOLPHIN (S. COERULEOALBA) species code: 13

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
881018	06	03	07			2	56	1.0	01 58 s	103 18 w	100.0	13.0	11.0
881018	09	03	11	01	01	4	55	1.1	02 25 s	103 37 w	100.0	43.0	38.0
881019	02	19	04	05	02	4	31	1.6	02 57 s	101 11 w	100.0	7.0	7.0
881020	04	05	04	01	01	5	55	1.7	02 50 s	099 06 w	100.0	82.0	65.0
881020	05	01	05	01	01	4	56	2.0	02 49 s	098 57 w	100.0	72.0	63.0
881020	06	01	06	12	12	4	69	3.3	02 48 s	098 49 w	100.0	74.0	62.0
881020	09	07	10	05	02	4	31	1.1	02 44 s	098 23 w	100.0	87.0	77.0
881021	01	01	01			3	31	2.9	02 49 s	096 58 w	100.0	86.0	74.0
881021	02	07	02			3	55	2.6	02 45 s	096 43 w	100.0	140.0	125.0
881021	09	03	11			4	55	3.5	03 05 s	096 15 w	100.0	231.0	207.0
881022	02	01	02	10	02	4	31	3.4	04 46 s	095 59 w	100.0	90.0	75.0
881022	05	12	05	03	02	4	56	0.8	05 59 s	095 36 w	100.0	147.0	123.0
881024	04	01	04	02	12	4	69	1.1	07 23 s	092 05 w	100.0	82.0	77.0
881026	01	05	02			3	64	0.7	03 50 s	087 58 w	1.3	1400.0	1233.0
881026	04	06	08	06	01	2	55	0.4	03 08 s	087 13 w	100.0	33.0	28.0
881026	05	01	09	06	01	3	56	2.7	03 07 s	087 13 w	100.0	32.0	28.0
881026	07	01	11	07	02	2	31	1.1	03 03 s	087 10 w	100.0	232.0	202.0
881027	06	01	06	11	01	3	69	2.9	03 17 s	085 20 w	100.0	165.0	147.0
881027	07	02	10	12	12	3	55	0.7	03 24 s	085 15 w	100.0	42.0	37.0
881110	06	01	13			4	69	4.4	09 08 s	086 53 w	100.0	57.0	53.0
881112	03	08	04			4	67	1.8	07 21 s	092 51 w	100.0	227.0	205.0
881113	01	14	02	06	01	4	55	0.2	06 50 s	094 50 w	100.0	75.0	62.0
881113	02	05	03			5	64	5.8	06 38 s	095 14 w	100.0	252.0	222.0
881114	01	03	01			4	56	3.0	06 05 s	097 27 w	100.0	90.0	82.0
881114	03	09	03	10	12	4	56	0.2	05 58 s	098 19 w	100.0	24.0	20.0
881114	08	03	09	11	02	4	64	3.5	05 51 s	099 01 w	100.0	72.0	53.0
881116	01	05	03			4	56	3.6	05 16 s	104 15 w	12.3	175.0	152.0
881117	01	07	01			5	64	2.0	05 10 s	107 39 w	100.0	57.0	43.0
881118	01	04	02			3	69	0.2	04 54 s	110 23 w	100.0	60.0	49.0
881118	02	06	03			5	55	0.2	04 44 s	110 51 w	41.7	353.0	310.0
881118	03	01	04			5	64	1.3	04 42 s	110 53 w	100.0	13.0	10.0
881118	06	01	08	11	03	4	64	3.1	04 34 s	111 34 w	100.0	29.0	23.0
881119	01	05	02	06	02	4	69	0.2	04 06 s	113 17 w	100.0	133.0	92.0
881122	01	02	01			4	31	0.0	02 26 s	122 50 w	100.0	62.0	55.0
881123	02	18	06	06	02	4	31	0.4	02 06 s	128 59 w	100.0	60.0	52.0
881125	03	05	03	06	01	3	69	2.7	00 25 n	124 26 w	100.0	93.0	80.0
881125	04	02	04	07	01	3	69	0.0	00 37 n	124 31 w	100.0	54.0	46.0
881125	05	01	05	08	01	3	55	5.0	00 39 n	124 30 w	100.0	47.0	42.0
881125	07	02	07	08	03	4	56	2.2	01 13 n	124 39 w	100.0	47.0	39.0
881126	07	01	09	07	02	3	55	4.8	04 17 n	124 30 w	100.0	80.0	73.0
881127	01	02	01			3	55	0.1	06 13 n	124 18 w	100.0	62.0	55.0
881129	02	03	01	03	02	4	69	0.4	12 35 n	122 49 w	100.0	18.0	16.0
881129	06	17	03			5	69	2.6	13 44 n	122 34 w	100.0	15.0	13.0

Table 3. (continued)

Sightings by Species

species: STRIPED DOLPHIN (S. COERULEOALBA) species code: 13

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
881202	01	02	01	03	03	1	64	5.7	21 42 n	119 49 w	100.0	92.0	80.0
881202	06	03	04	07	02	1	69	4.2	22 30 n	119 08 w	100.0	27.0	24.0
881203	01	03	02	03	03	3	55	3.1	24 23 n	118 06 w	100.0	97.0	83.0
881203	02	02	03	03	02	3	64	1.5	24 28 n	117 58 w	100.0	155.0	138.0

Table 3. (continued)

Sightings by Species

species: ROUGH-TOOTHED DOLPHIN (STENO BREDANENSIS) species code: 15

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
880803	03	03	03	12	12	3	38	0.1	14 12 n	118 54 w	100.0	10.0	8.0
880810	03	01	03			5	68	0.2	06 30 n	115 10 w	100.0	9.0	5.0
880904	05	04	10	04	02	2	51	1.6	08 54 n	146 02 w	100.0	15.0	12.0
880914	04	01	04			5	38	0.0	04 22 n	117 41 w	100.0	16.0	13.0
881007			03			4	64	0.1	01 36 n	081 03 w	100.0	15.0	15.0
881119	05	04	05	11	02	4	56	0.4	03 45 s	114 08 w	100.0	11.0	9.0
881121	04	01	04	08	01	1	67	1.0	02 37 s	120 17 w	98.3	123.0	115.0
881128	01	01	01			4	31	2.0	10 08 n	123 20 w	5.0	29.0	27.0
881130	01	04	01			4	56	0.2	16 58 n	121 51 w	100.0	22.0	17.0
881201	06	01	06			1	31	2.9	20 05 n	120 48 w	100.0	9.0	8.0

Table 3. (continued)

Sightings by Species

species: BOTTLENOSED DOLPHIN (TURSIOPS TRUNCATUS) species code: 18

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
880821	03	01	03			3	51	5.8	12 13 n	142 45 w	13.0	71.0	56.0
880924			01			5	38	0.0	01 09 s	090 58 w	92.0	135.0	100.0
881009	04	02	06	09	01	4	31	0.1	03 53 n	085 31 w	37.5	5.0	5.0
881013	04	08	02			4	55	0.9	01 42 n	091 56 w	100.0	100.0	75.0
881028	04	04	04	04	01	4	56	0.0	06 07 s	083 31 w	100.0	5.0	4.0
881029	01	08	01			4	56	1.9	08 12 s	082 18 w	8.3	21.0	19.0
881029	02	04	02			4	31	2.6	08 25 s	082 13 w	20.0	10.0	10.0
881029	07	03	09			4	67	0.6	08 58 s	083 03 w	30.0	30.0	2.0
881029	07	06	10			4	31	1.7	09 01 s	083 10 w	100.0	16.0	14.0
881108	01	01	01			4	64	1.7	11 43 s	079 08 w	100.0	17.0	15.0
881109	01	03	02			4	67	2.5	10 49 s	082 19 w	100.0	37.0	32.0
881109	02	01	03			4	69	0.3	10 48 s	082 24 w	100.0	66.0	56.0
881109	06	02	10			3	56	0.0	10 23 s	083 52 w	100.0	80.0	60.0
881110			07			3	64	0.5	09 33 s	085 52 w	100.0	10.0	8.0
881110	07	01	14			4	31	1.0	09 10 s	086 57 w	70.0	40.0	30.0
881112	01	08	01	06	01	4	64	4.3	07 38 s	091 46 w	50.0	35.0	31.0
881114	04	03	04	11	01	4	69	0.1	05 56 s	098 29 w	100.0	9.0	8.0
881114	05	03	05	11	01	5	69	1.8	05 54 s	098 37 w	74.0	20.0	18.0
881115	04	11	06			4	55	2.0	05 25 s	101 57 w	51.7	42.0	37.0
881119	02	02	04			3	67	1.4	03 58 s	113 36 w	67.5	37.0	32.0
881119	06	03	08	10	02	5	69	0.6	03 34 s	114 21 w	16.5	35.0	32.0
881120	02	21	02	10	01	4	67	2.2	02 50 s	117 23 w	4.7	44.0	41.0
881125	06	04	06	08	02	3	31	0.5	01 02 n	124 37 w	100.0	5.0	5.0
881128	01	01	01			4	31	2.0	10 08 n	123 20 w	10.0	29.0	27.0

Table 3. (continued)

Sightings by Species

species: RISSO'S DOLPHIN (GRAMPUS GRISEUS) species code: 21

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
880927	02	08	03			3	05	0.9	00 37 n	084 45 w	100.0	5.0	4.0
881009	04	02	06	09	01	4	31	0.1	03 53 n	085 31 w	12.5	5.0	5.0
881018	10	01	12	01	02	3	31	0.0	02 29 s	103 39 w	100.0	5.0	5.0
881021	06	01	07	03	01	3	55	0.6	02 49 s	096 19 w	100.0	4.0	3.0
881026	09	01	14			3	56	0.5	02 56 s	086 57 w	66.7	0.0*	42.0
881027	05	02	05	10	01	3	64	0.3	03 16 s	085 21 w	75.0	4.0	4.0
881029	04	02	04			4	67	1.1	08 38 s	082 31 w	100.0	9.0	7.0
881030	01	10	01	05	01	5	55	0.1	10 44 s	085 29 w	100.0	5.0	5.0
881109	03	10	04	11	01	3	64	0.9	10 33 s	083 16 w	100.0	8.0	8.0
881110	05	09	12			4	55	0.7	09 10 s	086 47 w	100.0	12.0	10.0
881110	07	01	14			4	31	1.0	09 10 s	086 57 w	30.0	40.0	30.0
881111	01	02	01			3	55	3.2	08 51 s	088 15 w	100.0	8.0	7.0
881111	02	04	02			4	31	0.6	08 46 s	088 36 w	100.0	5.0	5.0
881111	03	02	03			4	56	0.0	08 42 s	088 47 w	100.0	8.0	7.0
881112			05			4	64	0.2	07 21 s	092 52 w	100.0	3.0	3.0
881115	03	01	04			4	56	1.5	05 34 s	101 09 w	100.0	47.0	37.0
881121	01	02	01			2	56	1.3	02 34 s	119 35 w	100.0	28.0	24.0
881121	02	03	02	07	02	1	64	2.2	02 36 s	119 49 w	100.0	3.0	3.0
881121	02	04	03	07	02	2	69	3.2	02 36 s	119 55 w	100.0	16.0	13.0
881121	04	01	04	08	01	1	67	1.0	02 37 s	120 17 w	1.7	123.0	115.0
881121	05	02	05	09	01	2	31	0.4	02 38 s	120 25 w	100.0	11.0	10.0
881127	05	05	05			3	55	0.2	06 43 n	124 04 w	100.0	4.0	4.0
881127	07	03	06			3	31	1.2	07 03 n	123 58 w	100.0	50.0	44.0
881201	06	01	05			1	31	0.6	20 03 n	120 50 w	100.0	2.0	2.0

Table 3. (continued)

Sightings by Species

species: PACIFIC WHITE-SIDED DOLPHIN (LAGENORHYNCHUS OBLIQUIDENS) species code: 22

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
881204			02	03	02	3	31	4.8	27 37 n	115 00 w	60.0	250.0	225.0
881204			04	09	03	4	31	1.1	27 49 n	115 20 w	100.0	11.0	22.0

Table 3. (continued)

Sightings by Species

species: DUSKY DOLPHIN (L. OBSCURUS) — species code: 25

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
881107			01			4	31	0.9	12 02 s	077 22 w	100.0	7.0	6.0

Table 3. (continued)

Sightings by Species

species: FRASER'S DOLPHIN (LAGENODELPHIS HOSEI) species code: 26

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
880808	01	03	01	05	02	3	38	5.7	04 43 n	119 18 w	100.0	749.0	542.0
881126	02	03	02	04	01	4	64	2.5	03 28 n	124 30 w	100.0	97.0	82.0

Table 3. (continued)

Sightings by Species

species: MELON-HEADED WHALE (PEPONOCEPHALA ELECTRA) species code: 31

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
881007	01	01	01			3	31	2.4	01 28 n	081 00 w	100.0	242.0	187.0

Table 3. (continued)

Sightings by Species

species: PYGMY KILLER WHALE (FERESA ATTENUATA) species code: 32

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
880821	03	01	03			3	51	5.8	12 13 n	142 45 w	8.0	71.0	56.0
881123	01	15	04	09	01	4	64	0.8	02 15 s	127 43 w	100.0	15.0	12.0

Table 3. (continued)

Sightings by Species

species: FALSE KILLER WHALE (PSEUDORCA CRASSIDENS) species code: 33

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
880927			05			3	38	0.4	00 42 n	084 29 w	100.0	7.0	5.0

Table 3. (continued)

Sightings by Species

species: PILOT WHALE (GLOBICEPHALA SP.) species code: 34

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
				horz.	vert.								
yrmody			number			number	by	dist.(km)	deg min	deg min	(% of school)	best	low
880808	03	04	03			3	22	1.7	04 56 n	109 44 w	100.0	4.0	6.0
880815	03	05	02	11	02	4	38	0.9	13 06 n	127 45 w	100.0	15.0	12.0
880815	04	04	04	10	02	4	70	0.3	13 20 n	127 53 w	93.0	15.0	12.0
880904	04	13	06	04	01	2	05	1.1	09 05 n	146 09 w	100.0	16.0	14.0
880915	04	09	07			4	68	3.5	04 40 n	114 13 w	53.3	13.0	12.0
880916	07	01	05			4	70	0.7	04 57 n	111 34 w	47.3	3.0	3.0
880924			01			5	38	0.0	01 09 s	090 58 w	8.0	135.0	100.0
881018	10	01	13	01	02	3	64	0.4	02 30 s	103 39 w	100.0	17.0	15.0
881022	04	01	03	10	01	4	55	0.2	05 00 s	096 01 w	100.0	0.0*	9.0
881023	01	05	03	11	02	4	67	1.0	07 34 s	094 26 w	100.0	15.0	15.0
881023	03	08	05	04	01	4	69	0.0	08 14 s	093 55 w	100.0	7.0	7.0
881027	08	02	11	03	01	4	56	5.9	03 36 s	085 08 w	100.0	6.0	5.0
881029	01	08	01			4	56	1.9	08 12 s	082 18 w	91.7	21.0	19.0
881029	02	04	02			4	31	2.6	08 25 s	082 13 w	80.0	10.0	10.0
881029	07	03	09			4	67	0.6	08 58 s	083 03 w	70.0	30.0	2.0
881112	01	08	01	06	01	4	64	4.3	07 38 s	091 46 w	50.0	35.0	31.0
881114	05	03	05	11	01	5	69	1.8	05 54 s	098 37 w	26.0	20.0	18.0
881115	04	11	06			4	55	2.0	05 25 s	101 57 w	48.3	42.0	37.0
881119	02	02	04			3	67	1.4	03 58 s	113 36 w	32.5	37.0	32.0
881119	06	03	08	10	02	5	69	0.6	03 34 s	114 21 w	83.5	35.0	32.0
881120	02	21	02	10	01	4	67	2.2	02 50 s	117 23 w	95.2	44.0	41.0
881120	05	02	05	10	03	3	64	5.2	02 28 s	117 55 w	100.0	13.0	12.0
881122	03	04	02	08	01	4	69	0.2	02 33 s	123 30 w	100.0	17.0	15.0
881126	07	01	08	07	02	3	56	1.5	04 17 n	124 30 w	100.0	0.0*	6.0

Table 3. (continued)

Sightings by Species

species: KILLER WHALE (ORCINUS ORCA) species code: 37

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
880813			02	05	03	5	68	0.4	09 39 n	122 02 w	100.0	3.0	2.0
880818	04	03	04	08	01	3	38	0.2	11 16 n	134 21 w	100.0	4.0	4.0
880821	01	02	01			3	38	2.0	12 11 n	142 20 w	100.0	2.0	2.0
880914	02	07	01			5	68	4.7	04 14 n	118 21 w	5.0	77.0	58.0
880927	02	09	04			3	05	1.4	00 41 n	084 35 w	5.7	75.0	72.0
881108	04	04	04	06	01	4	64	2.0	11 32 s	079 44 w	100.0	12.0	11.0
881109	03	10	05	11	01	3	31	0.6	10 33 s	083 16 w	100.0	2.0	2.0
881112	04	02	06	11	03	4	31	3.1	07 16 s	093 07 w	100.0	15.0	13.0
881120	03	04	03	10	01	3	31	2.0	02 44 s	117 36 w	100.0	21.0	21.0

Table 3. (continued)

Sightings by Species

species: SPERM WHALE (PHYSETER MACROCEPHALUS) species code: 46

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
880803	02	03	02	11	12	3	70	0.9	14 18 n	119 04 w	100.0	2.0	2.0
880904			07	04	02	2	70	0.0	09 02 n	146 08 w	100.0	1.0	1.0
880911			01	11	01	6	99	0.4	05 25 n	125 40 w	100.0	5.0	4.0
881005	01	01	01			4	64	2.4	05 19 n	080 05 w	100.0	14.0	12.0
881005	02	03	03			4	56	5.3	05 05 n	080 09 w	11.0	0.0*	62.0
881021	08	01	09	03	01	4	31	4.5	02 54 s	096 17 w	100.0	7.0	5.0
881027	12	01	14	03	02	3	55	3.6	03 46 s	084 58 w	100.0	5.0	5.0
881108	04	04	05	06	01	4	64	2.4	11 32 s	079 46 w	100.0	96.0	87.0
881108	05	07	07			4	69	0.7	11 20 s	080 21 w	100.0	4.0	4.0
881110	01	04	01	06	02	3	69	6.3	09 50 s	085 22 w	100.0	1.0	1.0
881110	01	06	02	06	02	4	67	5.9	09 48 s	085 29 w	100.0	5.0	4.0
881116	01	02	01			5	64	6.4	05 16 s	103 56 w	100.0	1.0	1.0
881116	01	04	02			4	55	6.3	05 16 s	104 05 w	100.0	2.0	2.0
881116	02	08	04	11	01	4	31	3.3	05 06 s	105 04 w	100.0	4.0	4.0
881117	03	03	03	11	01	4	69	0.2	05 01 s	108 44 w	100.0	1.0	1.0
881118			07			4	31	0.4	04 34 s	111 33 w	100.0	5.0	5.0
881118	01	04	01			3	69	2.6	04 54 s	110 18 w	100.0	17.0	16.0
881119	06	01	06	10	02	4	31	2.3	03 40 s	114 14 w	100.0	3.0	2.0
881119	06	02	07	10	02	4	31	2.4	03 37 s	114 18 w	100.0	13.0	12.0
881119	07	01	09	10	03	5	55	0.2	03 33 s	114 27 w	100.0	0.0*	30.0

Table 3. (continued)

Sightings by Species

species: PYGMY SPERM WHALE (KOGIA BREVICEPS) species code: 47

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
880730	08	02	07			0	51	1.2	26 18 n	121 07 w	100.0	1.0	1.0

Table 3. (continued)

Sightings by Species

species: DWARF SPERM WHALE (KOGIA SIMUS) species code: 48

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
880816	01	07	01			2	38	0.4	13 25 n	129 19 w	100.0	1.0	1.0
880816	05	01	05			2	05	1.5	12 56 n	130 26 w	10.0	10.0	10.0
880910	04	01	06	11	01	1	38	1.1	07 45 n	128 25 w	100.0	3.0	3.0
880926	06	12	09			5	70	0.3	00 19 s	088 16 w	100.0	2.0	2.0
881024	03	01	03	02	12	4	69	0.1	07 23 s	092 06 w	100.0	1.0	1.0
881111	04	06	05	11	01	4	55	0.0	08 27 s	089 30 w	100.0	1.0	1.0
881201	05	01	03			1	56	0.3	20 03 n	120 59 w	100.0	1.0	1.0

Table 3. (continued)

Sightings by Species

species: BEAKED WHALE (ZIPHIID) species code: 49

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
880918			01			5	99	0.1	04 20 n	106 45 w	100.0	1.0	1.0
880923	02	02	02	12	12	3	70	1.1	00 05 s	092 57 w	100.0	2.0	2.0
881009	06	04	09			4	31	0.1	04 23 n	085 36 w	100.0	1.0	1.0
881018	03	01	03			3	31	4.0	01 50 s	103 03 w	100.0	1.0	1.0
881018	06	01	06			2	67	2.3	01 55 s	103 16 w	100.0	2.0	2.0
881022	05	12	06	03	02	4	56	0.8	05 59 s	095 36 w	100.0	1.0	1.0
881023	01	02	01	11	03	5	69	0.1	07 22 s	094 36 w	100.0	1.0	1.0
881023	04	05	06	04	02	4	69	0.6	08 28 s	093 45 w	100.0	1.0	1.0
881027	07	02	09	12	12	3	67	0.1	03 23 s	085 16 w	100.0	1.0	1.0
881029	06	05	07			4	64	0.2	08 52 s	082 54 w	100.0	1.0	1.0
881110	02	01	04	06	01	4	56	1.3	09 39 s	085 33 w	100.0	2.0	2.0
881114	07	03	08			5	67	0.0	05 52 s	098 52 w	100.0	1.0	1.0
881121	07	04	08	10	01	3	56	2.0	02 41 s	120 38 w	100.0	2.0	2.0
881123	01	07	01	07	02	4	67	2.0	02 11 s	126 49 w	100.0	1.0	1.0
881123	01	08	02	07	02	4	64	2.3	02 11 s	126 55 w	100.0	1.0	1.0
881204			01			4	69	0.8	27 10 n	115 07 w	100.0	2.0	2.0

Table 3. (continued)

Sightings by Species

species: UNID. MESOPLODONT (MESOPLODON SP.) species code: 51

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
880809	03	08	04	12	01	4	51	0.3	05 37 n	112 35 w	100.0	1.0	1.0
880809	04	03	05	12	01	4	51	0.1	05 42 n	112 46 w	100.0	1.0	1.0
880915			05	12	12	3	99	0.6	04 40 n	114 56 w	100.0	3.0	3.0
880928	02	01	02			3	05	1.0	02 10 n	082 22 w	100.0	3.0	3.0
881017	02	01	04			1	31	3.4	00 04 n	100 28 w	100.0	2.0	2.0
881017	08	01	11	01	01	3	56	2.5	00 26 s	101 06 w	100.0	6.0	4.0
881017	09	03	13	01	01	3	31	0.1	00 34 s	101 17 w	100.0	2.0	2.0
881020	03	01	03	12	02	4	69	0.3	02 50 s	099 24 w	100.0	4.0	4.0
881021			10			4	69	0.0	02 57 s	096 16 w	100.0	5.0	5.0
881023	02	03	04	10	01	4	69	0.1	07 47 s	094 15 w	100.0	4.0	4.0
881026	03	04	05	01	01	2	55	0.1	03 31 s	087 40 w	100.0	1.0	1.0
881026	06	01	10	07	02	2	67	0.0	03 06 s	087 12 w	100.0	3.0	3.0
881026	08	04	13			3	56	1.2	02 57 s	086 59 w	100.0	4.0	4.0
881029			05			4	04	0.7	08 38 s	082 32 w	100.0	2.0	2.0
881029	03	02	03			4	55	0.1	08 33 s	082 23 w	100.0	2.0	2.0
881108	02	03	02			4	31	0.0	11 38 s	079 23 w	100.0	3.0	3.0
881108	05	13	09			4	67	0.7	11 13 s	080 43 w	100.0	3.0	3.0
881109	05	02	08			3	31	0.0	10 26 s	083 44 w	100.0	5.0	4.0
881112	03	04	03			4	31	1.2	07 25 s	092 38 w	100.0	3.0	3.0
881115	01	02	01			4	55	2.7	05 43 s	100 35 w	100.0	4.0	4.0
881115	05	05	08			4	67	1.2	05 24 s	102 21 w	100.0	1.0	1.0
881120	04	05	04	10	02	3	64	0.6	02 30 s	117 52 w	100.0	5.0	5.0
881123	01	12	03	08	01	4	55	1.3	02 14 s	127 29 w	100.0	1.0	1.0

Table 3. (continued)

Sightings by Species

species: CUVIER'S BEAKED WHALE (ZIPHIUS CAVIROSTRIS) species code: 61

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
881013	04	06	01			4	55	0.5	01 43 n	091 48 w	100.0	1.0	1.0
881018	11	02	14	03	02	3	64	1.6	02 33 s	103 42 w	100.0	7.0	5.0
881023	01	04	02	11	02	4	55	2.1	07 31 s	094 29 w	100.0	1.0	1.0
881026			06	06	01	3	04	0.1	03 17 s	087 24 w	100.0	2.0	2.0
881027	07	02	08	12	12	3	56	0.3	03 23 s	085 16 w	100.0	2.0	2.0
881110	03	02	05			4	31	3.5	09 36 s	085 31 w	100.0	4.0	4.0
881111	03	03	04	06	01	4	67	0.7	08 40 s	088 55 w	100.0	5.0	5.0
881111	05	04	07	10	03	4	67	0.3	08 09 s	089 52 w	100.0	4.0	4.0
881117	02	02	02			4	56	0.1	05 02 s	108 36 w	100.0	1.0	1.0
881120	01	02	01			4	31	0.2	03 04 s	116 08 w	100.0	1.0	1.0
881121			06	09	01	2	04	0.2	02 38 s	120 25 w	100.0	1.0	1.0
881124	04	02	04	06	01	4	64	0.5	00 57 s	126 02 w	100.0	3.0	3.0

Table 3. (continued)

Sightings by Species

species: RORQUAL (BALAENOPTERA SP.) species code: 70

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
880731	05	07	04	04	02	3	05	3.4	23 11 n	120 00 w	100.0	1.0	1.0
880808	04	05	04			3	38	2.1	05 03 n	109 59 w	100.0	1.0	1.0
880810	05	03	05	12	01	4	70	0.3	06 35 n	115 28 w	100.0	1.0	1.0
880903	02	11	01	10	01	4	70	10.1	11 57 n	148 41 w	100.0	1.0	1.0
880908	01	04	01			5	70	3.5	05 07 n	133 10 w	100.0	2.0	2.0
880909	01	07	01	11	02	5	05	0.3	05 33 n	131 22 w	100.0	1.0	1.0
880916	03	02	02	12	02	4	68	2.7	04 42 n	112 33 w	100.0	1.0	1.0
880916	08	02	06			5	51	2.1	04 57 n	111 20 w	100.0	0.0*	1.0
881009	03	01	03			5	31	1.2	04 01 n	084 53 w	100.0	1.0	1.0
881017	09	02	12	01	01	3	69	0.6	00 28 s	101 11 w	100.0	1.0	1.0
881021	04	01	04			2	64	1.7	02 49 s	096 30 w	100.0	1.0	1.0
881026	08	01	12			3	69	3.2	03 01 s	087 04 w	100.0	1.0	1.0
881027	10	02	13	02	01	3	69	3.1	03 42 s	085 01 w	100.0	1.0	1.0
881111	06	01	08	10	03	4	55	0.9	08 08 s	089 53 w	100.0	1.0	1.0
881114	02	02	02			4	55	0.6	06 05 s	097 38 w	100.0	2.0	2.0
881114	07	03	07			5	67	0.2	05 52 s	098 51 w	100.0	2.0	2.0
881115	02	02	02			4	31	1.3	05 36 s	101 01 w	100.0	1.0	1.0
881115	02	02	03			4	69	1.3	05 35 s	101 05 w	100.0	1.0	1.0
881115	05	05	07			4	55	3.6	05 24 s	102 18 w	100.0	1.0	1.0
881117	03	05	04			4	64	0.1	05 01 s	108 49 w	100.0	1.0	1.0
881126	01	07	01			4	55	0.1	03 15 n	124 32 w	100.0	1.0	1.0
881126	03	06	03	06	01	4	67	4.5	03 48 n	124 26 w	100.0	1.0	1.0
881126	03	06	04	06	01	4	55	0.1	03 48 n	124 26 w	100.0	1.0	1.0
881128			02			5	31	1.6	10 14 n	123 19 w	100.0	1.0	1.0
881128	03	02	03	08	02	4	67	5.6	10 22 n	123 19 w	100.0	1.0	1.0
881128	03	03	04	08	02	4	55	1.0	10 24 n	123 18 w	100.0	1.0	1.0
881201	02	13	02	05	01	2	31	3.1	19 39 n	121 07 w	100.0	1.0	1.0

Table 3. (continued)

Sightings by Species

species: MINKE WHALE (B.ACUTOROSTRATA) species code: 71

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
881203	03	03	04	04	02	3	64	0.5	24 38 n	117 53 w	100.0	1.0	1.0

Table 3. (continued)

Sightings by Species

species: BRYDE'S WHALE (B. EDENI) species code: 72

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
880907			02			6	38	0.2	04 59 n	137 18 w	100.0	1.0	1.0
880923	05	02	05	12	12	3	22	0.3	00 14 s	092 56 w	100.0	5.0	5.0
881020	08	01	08	06	01	4	55	0.3	02 44 s	098 38 w	100.0	2.0	2.0
881028			03			4	04	0.6	05 59 s	083 37 w	100.0	2.0	2.0
881111	04	07	06	11	01	4	55	1.7	08 24 s	089 40 w	100.0	1.0	1.0
881117	04	05	05			4	67	0.6	05 02 s	109 07 w	100.0	1.0	1.0
881129	05	05	02	06	01	4	64	0.6	13 02 n	122 40 w	100.0	2.0	2.0

Table 3. (continued)

Sightings by Species

species: BLUE WHALE (B. MUSCULUS) species code: 75

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
881021	07	02	08	03	01	4	67	3.3	02 52 s	096 19 w	100.0	5.0	5.0

Table 3. (continued)

Sightings by Species

species: HUMPBACK WHALE (MEGAPTERA NOVAEANGLIAE) species code: 76

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
881021	05	02	06	04	12	3	56	0.9	02 46 s	096 23 w	100.0	2.0	2.0
881204			03			4	04	1.6	27 43 n	115 08 w	100.0	2.0	2.0
881204			05			4	31	0.0	27 49 n	115 20 w	100.0	2.0	2.0

Table 3. (continued)

Sightings by Species

species: UNIDENTIFIED DOLPHIN species code: 77

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
880730	07	01	06			0	51	8.8	26 26 n	121 10 w	100.0	0.0*	2.0
880731	06	02	05			3	70	7.8	23 02 n	119 57 w	100.0	0.0*	2.0
880801	04	05	03			4	51	1.2	19 36 n	118 56 w	100.0	0.0*	1.0
880803	01	12	01			4	38	1.0	14 23 n	119 17 w	100.0	0.0*	4.0
880803	03	04	04	06	01	3	38	3.2	14 08 n	118 44 w	100.0	0.0*	1.0
880803	03	09	05			3	38	0.5	13 56 n	118 16 w	100.0	0.0*	3.0
880803	04	01	06			3	68	0.5	13 56 n	118 13 w	100.0	0.0*	3.0
880804	03	01	02			3	70	0.4	11 47 n	116 14 w	100.0	0.0*	18.0
880805	01	04	01			2	05	6.4	11 10 n	115 04 w	100.0	0.0*	1.0
880807	03	08	03	05	03	5	51	3.0	05 11 n	109 02 w	100.0	0.0*	1.0
880808	05	06	05	01	03	3	22	1.1	05 01 n	110 20 w	100.0	0.0*	5.0
880809	02	01	03			3	38	3.7	05 21 n	112 01 w	100.0	12.0	11.0
880810	02	05	02			5	68	0.1	06 29 n	115 06 w	100.0	0.0*	3.0
880811	02	04	01	11	02	5	70	0.8	07 44 n	118 20 w	100.0	0.0*	20.0
880813	01	01	01			5	68	0.9	09 38 n	122 01 w	100.0	16.0	5.0
880815	04	04	04	10	02	4	70	0.3	13 20 n	127 53 w	7.0	15.0	12.0
880816			06			2	05	6.8	12 55 n	130 27 w	100.0	0.0*	4.0
880816	03	09	03			2	51	4.9	12 58 n	130 12 w	100.0	0.0*	1.0
880816	06	01	07			2	70	0.4	12 53 n	130 32 w	100.0	0.0*	1.0
880821	01	02	02			3	68	0.6	12 11 n	142 21 w	100.0	9.0	7.0
880821	03	01	03			3	51	5.8	12 13 n	142 45 w	79.0	71.0	56.0
880822	02	04	01			2	05	1.8	11 54 n	143 28 w	100.0	0.0*	7.0
880822	02	10	02	10	01	2	70	3.0	12 22 n	143 40 w	100.0	1.0	1.0
880822	03	04	03			2	51	0.9	12 48 n	143 51 w	100.0	25.0	10.0
880903			04			4	70	0.5	10 57 n	148 02 w	100.0	0.0*	2.0
880903	05	04	03			4	38	0.8	11 11 n	148 08 w	100.0	0.0*	3.0
880903	06	01	05			3	38	3.5	10 52 n	147 58 w	100.0	0.0*	4.0
880904	04	09	05	04	01	2	68	5.9	09 15 n	146 19 w	100.0	0.0*	52.0
880904	05	04	09	04	02	2	51	1.2	08 54 n	146 03 w	100.0	0.0*	1.0
880906			03			4	99	0.0	05 58 n	141 20 w	100.0	0.0*	4.0
880910			03	02	03	1	70	1.4	07 48 n	128 48 w	100.0	0.0*	30.0
880914	02	07	01			5	68	4.7	04 14 n	118 21 w	15.7	77.0	58.0
880914	03	04	02			5	70	0.4	04 17 n	118 04 w	100.0	0.0*	1.0
880915	01	03	01	11	03	5	38	0.1	04 35 n	115 40 w	100.0	0.0*	1.0
880915	02	06	03	12	01	5	70	4.1	04 33 n	115 23 w	100.0	0.0*	1.0
880915	02	06	04	12	01	5	05	5.7	04 33 n	115 23 w	100.0	0.0*	9.0
880915	04	09	07			4	68	3.5	04 40 n	114 13 w	13.3	13.0	12.0
880916	03	02	01	12	02	4	51	0.7	04 47 n	112 34 w	100.0	3.0	3.0
880916	07	01	05			4	70	0.7	04 57 n	111 34 w	19.3	3.0	3.0
880918	03	02	02			5	38	2.9	04 20 n	106 41 w	100.0	0.0*	3.0
880919	04	06	03			5	38	2.7	03 36 n	101 55 w	100.0	0.0*	2.0
880923	04	01	04	12	12	3	70	0.8	00 09 s	092 57 w	100.0	0.0*	50.0
880923	08	01	06	04	03	5	51	3.7	00 47 s	092 34 w	100.0	450.0	200.0

Table 3. (continued)

Sightings by Species

species: UNIDENTIFIED DOLPHIN species code: 77

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
880926	01	04	01			4	05	0.2	01 03 s	088 39 w	100.0	23.0	16.0
880927	01	01	01			5	68	2.2	00 17 n	085 33 w	100.0	0.0*	2.0
880928			07			3	51	1.8	02 50 n	082 04 w	100.0	0.0*	5.0
880928	01	01	01			3	70	2.4	02 07 n	082 25 w	100.0	0.0*	15.0
880928	03	01	04			4	38	4.1	02 18 n	082 16 w	100.0	0.0*	2.0
880928	03	01	05			4	51	5.9	02 19 n	082 16 w	100.0	5.0	3.0
880928	06	04	11	09	03	4	70	1.5	03 47 n	081 38 w	100.0	0.0*	25.0
881007	04	11	05			4	55	0.7	02 12 n	081 28 w	100.0	1.0	1.0
881008	01	02	01			4	67	7.0	03 57 n	082 32 w	100.0	0.0*	20.0
881009	02	01	02			5	31	3.9	04 04 n	084 51 w	100.0	2.0	0.0*
881009	05	03	08	09	02	4	55	1.5	04 14 n	085 34 w	100.0	0.0*	2.0
881010			02			4	67	0.6	06 47 n	086 04 w	100.0	0.0*	0.0*
881010	02	01	01			4	67	2.4	06 46 n	086 04 w	100.0	0.0*	0.0*
881014	06	01	03			5	64	0.8	02 43 n	093 44 w	100.0	1.0	1.0
881014	07	01	04			5	31	8.3	02 45 n	093 45 w	100.0	40.0	60.0
881015	03	08	01	09	01	5	55	7.9	03 30 n	095 44 w	100.0	0.0*	10.0
881016	01	07	01			4	64	0.5	01 06 n	098 57 w	100.0	1.0	1.0
881017	01	01	02			1	69	4.1	00 04 n	100 18 w	100.0	50.0	40.0
881017	02	01	03			1	31	6.2	00 03 n	100 07 w	100.0	20.0	15.0
881017	06	01	09			2	31	6.5	00 21 s	100 48 w	100.0	0.0*	1.0
881018	01	05	01			3	55	1.2	01 39 s	102 52 w	100.0	0.0*	1.0
881018	07	01	08	09	12	3	31	7.9	01 59 s	103 21 w	100.0	0.0*	10.0
881018	08	01	10	01	01	3	67	0.4	02 13 s	103 26 w	100.0	7.0	5.0
881019	01	01	02			3	69	4.0	02 59 s	102 26 w	100.0	0.0*	0.0*
881019	02	16	03			4	55	7.4	02 58 s	101 28 w	100.0	0.0*	5.0
881021	10	01	12	03	03	4	64	0.5	03 13 s	096 18 w	100.0	60.0	55.0
881022	01	04	01	10	03	4	69	2.4	04 40 s	096 00 w	100.0	3.0	3.0
881026	01	02	01			3	56	8.5	03 54 s	088 02 w	100.0	0.0*	4.0
881026	02	01	03			2	31	0.9	03 41 s	087 51 w	100.0	1.0	1.0
881026	09	01	14			3	56	0.5	02 56 s	086 57 w	33.3	0.0*	42.0
881027	02	01	02	10	02	3	55	0.1	03 03 s	085 28 w	100.0	2.0	2.0
881027	05	02	05	10	01	3	64	0.3	03 16 s	085 21 w	25.0	4.0	4.0
881027	07	01	07	11	01	3	31	6.2	03 21 s	085 17 w	100.0	2.0	2.0
881028			01	11	03	3	04	0.4	05 09 s	084 10 w	100.0	3.0	3.0
881028	02	08	02	02	12	4	69	3.7	05 53 s	083 39 w	100.0	2.0	2.0
881029	07	03	08			4	67	1.8	08 56 s	082 58 w	100.0	0.0*	0.0*
881108	03	03	03	06	01	4	55	0.5	11 35 s	079 33 w	100.0	0.0*	1.0
881109	01	02	01			4	56	3.0	10 50 s	082 11 w	100.0	0.0*	0.0*
881109	06	01	09			3	64	6.3	10 24 s	083 45 w	100.0	20.0	15.0
881110	05	07	10			4	55	5.8	09 13 s	086 37 w	100.0	0.0*	1.0
881110	05	08	11			4	56	1.5	09 11 s	086 43 w	100.0	0.0*	3.0
881112	02	10	02			4	69	0.9	07 30 s	092 21 w	100.0	1.0	1.0
881118	04	01	05			5	31	2.2	04 42 s	110 58 w	100.0	3.0	3.0

Table 3. (continued)

Sightings by Species

species: UNIDENTIFIED DOLPHIN species code: 77

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
881119	01	01	01	06	03	4	55	7.0	04 12 s	112 56 w	100.0	0.0*	2.0
881122	04	06	03	09	01	4	55	0.3	02 26 s	123 55 w	100.0	0.0*	1.0
881127	02	01	02			3	55	6.6	06 18 n	124 15 w	100.0	0.0*	10.0
881127	02	02	03			3	69	5.1	06 18 n	124 15 w	100.0	1.0	1.0
881127	03	01	04			3	69	3.4	06 22 n	124 14 w	100.0	15.0	15.0
881127	08	01	07			3	31	0.4	07 07 n	123 57 w	100.0	6.0	6.0
881127	09	03	09			3	56	5.6	07 13 n	123 59 w	100.0	0.0*	1.0
881128	01	01	01			4	31	2.0	10 08 n	123 20 w	85.0	29.0	27.0
881202	02	02	02	03	02	1	55	7.2	21 51 n	119 39 w	100.0	0.0*	2.0
881203	01	02	01	03	03	3	56	7.3	24 20 n	118 08 w	100.0	0.0*	50.0
881203	05	05	05	06	02	3	67	6.5	25 16 n	117 30 w	100.0	0.0*	30.0

Table 3. (continued)

Sightings by Species

species: UNIDENTIFIED SMALL WHALE species code: 78

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
880730	06	05	05			1	68	0.0	26 29 n	121 11 w	100.0	1.0	1.0
880816	07	01	08	01	01	2	05	0.6	12 53 n	130 33 w	100.0	0.0*	2.0
880906	03	01	02			4	38	0.0	05 58 n	141 20 w	100.0	0.0*	3.0
880920	02	03	01			5	51	0.1	03 35 n	100 00 w	100.0	1.0	1.0
880926			07			5	99	0.1	00 28 s	087 42 w	100.0	1.0	1.0
880927	03	05	06			3	70	0.3	00 49 n	084 05 w	100.0	1.0	1.0
880927	03	09	07			3	38	0.3	00 53 n	083 55 w	100.0	2.0	2.0
881022	05	03	04	12	12	4	31	2.0	05 11 s	095 57 w	100.0	0.0*	1.0
881029	06	05	06			4	69	0.0	08 51 s	082 52 w	100.0	2.0	2.0
881108	05	06	06			4	31	0.5	11 21 s	080 17 w	100.0	0.0*	0.0*
881108	05	08	08			4	69	0.7	11 17 s	080 30 w	100.0	1.0	1.0
881116	02	09	05	11	01	5	31	0.4	05 06 s	105 06 w	100.0	1.0	1.0
881119	02	01	03			3	69	1.2	04 00 s	113 25 w	100.0	1.0	1.0
881121	06	01	07	09	01	2	69	2.5	02 39 s	120 25 w	100.0	1.0	1.0
881123	02	01	05	10	01	4	31	1.9	02 15 s	127 45 w	100.0	1.0	1.0
881124	01	08	01	01	02	5	55	0.4	01 16 s	126 39 w	100.0	1.0	1.0
881124	02	03	02	02	01	5	69	4.6	01 14 s	126 33 w	100.0	2.0	2.0
881127	09	02	08	07	01	3	67	0.1	07 10 n	123 59 w	100.0	1.0	1.0

Table 3. (continued)

Sightings by Species

species: UNIDENTIFIED LARGE WHALE — species code: 79

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
880809	01	01	01			3	68	0.4	05 15 n	111 29 w	100.0	1.0	1.0
880810	06	01	06	12	01	4	22	0.5	06 36 n	115 28 w	100.0	1.0	1.0
880810	06	04	07	11	01	4	38	0.0	06 42 n	115 36 w	100.0	1.0	1.0
880814	01	06	01			5	68	4.9	11 03 n	124 31 w	100.0	1.0	1.0
881113	01	01	01			4	67	6.4	06 58 s	094 17 w	100.0	1.0	1.0
881115	04	03	05	08	12	4	69	3.2	05 30 s	101 23 w	100.0	1.0	1.0
881115	06	02	09			4	55	7.9	05 23 s	102 28 w	100.0	1.0	1.0
881118	05	08	06	11	03	4	64	4.3	04 33 s	111 31 w	100.0	1.0	1.0

Table 3. (continued)

Sightings by Species

species: UNIDENTIFIED CETACEAN species code: 96

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
880906	01	04	01	11	03	3	70	0.0	06 06 n	141 35 w	100.0	0.0*	1.0
880910	01	02	01	02	03	1	70	0.7	07 48 n	128 48 w	100.0	1.0	1.0
880915	02	01	02	11	03	5	38	2.4	04 34 n	115 39 w	100.0	0.0*	1.0
881019	01	01	01			3	69	0.7	02 59 s	102 29 w	100.0	1.0	1.0
881020	01	01	01			3	55	2.3	02 57 s	099 37 w	100.0	2.0	2.0
881024	01	03	01	01	03	4	55	8.3	07 43 s	092 36 w	100.0	0.0*	2.0
881024	01	09	02	01	01	4	55	0.7	07 29 s	092 18 w	100.0	1.0	1.0
881026	04	03	07			2	56	3.1	03 13 s	087 20 w	100.0	1.0	1.0
881109	03	12	06	11	01	3	56	0.7	10 29 s	083 30 w	100.0	1.0	1.0
881109	04	02	07			3	56	0.0	10 27 s	083 37 w	100.0	2.0	2.0
881110	05	05	09	11	01	3	64	1.3	09 15 s	086 32 w	100.0	1.0	1.0
881114	06	01	06	11	01	5	55	0.1	05 54 s	098 43 w	100.0	0.0*	1.0
881123	04	01	07			4	55	0.0	02 00 s	127 52 w	100.0	0.0*	1.0
881126	05	03	06			3	64	0.7	04 04 n	124 30 w	100.0	1.0	1.0

Sightings by Species

species: UNIDENTIFIED WHALE species code: 98

date	series	leg	sight	sun position		beauf.	detected	perp.	latitude	longitude	proportion	mean school size est	
yrmody			number	horz.	vert.	number	by	dist.(km)	deg min	deg min	(% of school)	best	low
880731	05	01	03			3	05	6.2	23 39 n	120 10 w	100.0	1.0	1.0
880807	03	01	02	05	01	6	38	2.8	05 46 n	109 25 w	100.0	1.0	1.0
880811	03	04	02	11	03	5	51	0.1	08 00 n	118 36 w	100.0	1.0	1.0
880813	03	01	04			5	70	0.1	10 07 n	122 37 w	100.0	1.0	1.0
880815			03			4	51	0.0	13 07 n	127 44 w	100.0	1.0	1.0
880904	04	07	04	12	12	3	68	2.3	09 20 n	146 23 w	100.0	1.0	1.0
880915	04	03	06	06	01	5	68	1.0	04 40 n	114 39 w	100.0	0.0*	1.0
880926			03	01	02	4	38	1.4	00 59 s	088 32 w	100.0	1.0	1.0
880926	04	07	04	01	01	5	70	0.5	00 48 s	088 21 w	100.0	0.0*	3.0
880926	06	04	06			5	68	0.1	00 33 s	087 54 w	100.0	2.0	1.0
880926	06	07	08			5	70	0.0	00 26 s	087 27 w	100.0	1.0	1.0
880927	02	04	02			4	51	0.9	00 28 n	085 10 w	100.0	1.0	1.0
880928	04	11	08			3	51	7.9	02 51 n	082 04 w	100.0	1.0	1.0
881008	03	14	04	11	02	4	69	0.4	04 56 n	083 16 w	100.0	1.0	1.0
881009	01	02	01			5	69	0.2	04 06 n	084 49 w	100.0	3.0	3.0
881009	03	06	04			5	69	3.6	03 44 n	085 12 w	100.0	1.0	1.0
881010			05			6	31	1.4	06 52 n	086 24 w	100.0	1.0	1.0
881010	03	07	03			5	56	5.6	07 03 n	086 13 w	100.0	0.0*	0.0*
881014	08	08	07			5	55	0.2	03 06 n	093 57 w	100.0	1.0	1.0
881020	09	06	09	05	02	4	64	1.3	02 44 s	098 29 w	100.0	1.0	1.0
881026	03	04	04	01	01	2	67	6.4	03 32 s	087 41 w	100.0	2.0	2.0
881124	04	01	03	06	01	4	69	5.2	00 58 s	126 03 w	100.0	1.0	1.0

Table 4. Marine mammal school size estimates for each observer, classified by species code, for all sightings encountered in the eastern tropical Pacific during July through September (Part A) and October through December (Part B), 1988.

A. Sightings encountered July through September 1988.

	date	sight no.	obs 5 best est.	obs 5 pct	obs 22 best est.	obs 22 pct	obs 38 best est.	obs 38 pct	obs 51 best est.	obs 51 pct	obs 68 best est.	obs 68 pct	obs 70 best est.	obs 70 pct
species 2														
	880730	03	75	100	65	100	70	100	125	100	130	100	50	100
	880730	04					150	100	300	100	240	100		
	880731	02	75	100	65	100	75	100	85	100	61	100	40	100
	880801	02	275	100	85	100	200	100	400	100	156	100	225	100
	880802	01					125	100	130	100	108	100		
	880803	07							90	40	96	20		
	880810	01	225	80			125	60	65	70	100	70		
	880810	08			50	100					230	100	200	100
	880816	04	350	10	350	7	250	20			340	15	400	5
	880818	01					200	60	250	70	330	60		
	880818	02					20	100	15	100	57	100		
	880904	02					115	60	150	80	120	50		
	880904	03					180	25	300	40				
	880909	02	350	40	160	50	150	45	230	40	320	60	275	55
	880914	01					70	88	40	75	120	75		
	880914	03					90	25	70	15				
	880916	03					175	50			140	75		
	880916	04	350	80										
	880919	02					100	100			200	100		
species 5														
	880730	01	20	100										
	880804	01	75	100	35	100	75	100					45	100
	880923	03	550	100	340	100							475	100
species 10														
	880803	07							90	60	96	80		
species 11														
	880810	01	225	20			125	40	65	30	100	30		
	880815	01			55	100	60	100	60	100	122	100		
	880816	02					90	100	97	100	210	100		
	880816	04	350	90	350	93	250	80			340	85	400	95
	880816	09	40	100	30	100	40	100			89	100	125	100
	880817	01					45	100	25	100	40	100		
	880817	02	15	100	9	100							20	100
	880817	03					20	100	45	100	65	100		
	880817	04	60	30	45	34							100	20
	880818	01					200	40	250	30	330	40		
	880818	06	250	100	85	100								
	880822	04	30	100	35	100			20	100	40	100	90	100
	880903	02	240	100	65	100	135	100	135	100	65	100	225	100
	880904	01	170	100	85	100	125	100					225	100
	880904	02					115	40	150	20	120	50		
	880904	03					180	75	300	60				

Table 4A. (continued)

			obs 5		obs 22		obs 38		obs 51		obs 68		obs 70	
	date	sight no.	best est.	pct	best est.	pct	best est.	pct	best est.	pct	best est.	pct	best est.	pct
species 11														
	880909	02	350	60	160	50	150	55	230	60	320	40	275	45
	880914	03					90	75	70	85				
	880916	03					175	50			140	25		
	880916	04	350	20										
species 13														
	880730	02	27	100			45	100	55	100	30	100	35	100
	880731	01	20	100	17	100							25	100
	880801	01									34	100		
	880807	01	2	100	2	100							2	100
	880808	02					20	100						
	880809	02	25	100			15	100	19	100	24	100	20	100
	880810	04					40	100	45	100	96	100		
	880813	03					20	100	40	100	32	100		
	880816	05	10	90										
	880816	10					30	100	28	100	77	100		
	880816	11	30	100	25	100							50	100
	880817	04	60	70	45	66							100	80
	880818	03	200	100	75	100							125	100
	880818	05					90	100	68	100	130	100		
	880910	02	200	100									225	100
	880910	04					27	100	33	100	43	100		
	880910	05	20	100			20	100			43	100		
	880910	07	6	100									10	100
	880910	08					60	100	40	100	110	100		
	880910	09							100	100	110	100		
	880919	01					60	100			135	100		
	880926	02					65	100	70	100	155	100		
	880926	05	50	100	60	100							50	100
	880927	04			75	99								
	880928	03					70	100					75	100
	880928	06							6	100	12	100		
	880928	10					75	100	32	100	38	100		
species 15														
	880803	03	6	100	6	100	12	100			14	100	10	100
	880810	03					12	100	9	100	7	100		
	880904	10					12	100	17	100	14	100	15	100
	880914	04					22	100	10	100				
species 18														
	880821	03									71	13		
species 21														
	880927	03	5	100										
species 26														
	880808	01	600	100	850	100	600	100	1700	100	395	100	350	100

Table 4A. (continued)

	date	sight no.	obs 5 best est.	obs 5 pct	obs 22 best est.	obs 22 pct	obs 38 best est.	obs 38 pct	obs 51 best est.	obs 51 pct	obs 68 best est.	obs 68 pct	obs 70 best est.	obs 70 pct
species 32														
	880821	03									71	8		
species 34														
	880808	03			4	100								
	880815	02	24	100	10	100	17	100	15	100	15	100	10	100
	880815	04	23	96			10	90	13	92			16	94
	880904	06	18	100							15	100	15	100
	880915	07					12	85			19	75		
	880916	05	3	67									4	75
species 37														
	880818	04					4	100	3	100	6	100		
	880821	01					2	100						
	880914	01					70	5	40	5	120	5		
	880927	04			75	1								
species 46														
	880803	02	2	100	2	100							2	100
species 47														
	880730	07					1	100	1	100			1	100
species 48														
	880816	01					1	100	1	100				
	880816	05	10	10										
	880910	06					3	100						
	880926	09											2	100
species 49														
	880923	02	2	100									2	100
species 51														
	880809	04					1	100	1	100				
	880809	05					1	100	1	100	1	100		
	880928	02	3	100										
species 70														
	880731	04	1	100										
	880808	04					1	100						
	880810	05			1	100					1	100	1	100
	880903	01	1	100									1	100
	880908	01	2	100	2	100							2	100
	880909	01	1	100										
	880916	02					1	100	1	100	1	100		
species 72														
	880923	05	5	100										

Table 4A. (continued)

	date	sight no.	obs 5 best est.	obs 5 pct	obs 22 best est.	obs 22 pct	obs 38 best est.	obs 38 pct	obs 51 best est.	obs 51 pct	obs 68 best est.	obs 68 pct	obs 70 best est.	obs 70 pct
species	77													
	880809	03							15	100	10	100		
	880813	01									16	100		
	880815	04	23	4			10	10	13	8			16	6
	880821	02									9	100		
	880821	03									71	79		
	880822	02											1	100
	880822	03							25	100				
	880914	01					70	7	40	20	120	20		
	880915	07					12	15			19	25		
	880916	01							3	100				
	880916	05	3	33									4	25
	880923	06							450	100				
	880926	01	15	100	35	100							18	100
	880928	05					5	100						
species	78													
	880730	05							1	100	1	100		
	880920	01							1	100				
	880927	06											1	100
	880927	07					2	100						
species	79													
	880809	01					1	100			1	100		
	880810	06			1	100								
	880810	07									1	100		
	880814	01									1	100		
species	96													
	880910	01											1	100
species	98													
	880731	03	1	100										
	880807	02					1	100						
	880811	02							1	100				
	880813	04											1	100
	880904	04									1	100		
	880926	06									2	100		
	880926	08											1	100
	880927	02							1	100				
	880928	08							1	100				

Table 4B. Sightings encountered October through December, 1988.

	date	sight no.	obs 4 best est.	obs 4 pct	obs 12 best est.	obs 12 pct	obs 31 best est.	obs 31 pct	obs 55 best est.	obs 55 pct	obs 56 best est.	obs 56 pct	obs 64 best est.	obs 64 pct	obs 67 best est.	obs 67 pct	obs 69 best est.	obs 69 pct
species	2																	
	881014	01					110	95					80	92			550	98
	881014	02							300	40	250	20			325	35		
	881014	06					40	100									50	100
	881020	02					480	5	1600	20	800	3	1050	15	525	5		
	881110	06					165	75									225	90
	881110	08							500	100	360	100			300	100		
	881116	03											195	8			160	1
	881125	01					480	100					375	100			380	100
	881125	02							110	100	300	100			260	100		
	881126	05							170	75	180	80			215	80		
	881126	07					1240	98									1600	99
	881201	01							145	100	350	100			220	100		
	881201	04					68	100	160	100			180	100			120	100
	881202	03					65	100					160	100			80	100
species	3																	
	881014	01					110	5					80	8			550	2
species	5																	
	881008	03							200	100	50	100			45	100		
	881010	04					650	100	800	100	400	100			750	100	1400	100
	881017	01					400	100					600	100			1400	100
	881017	05					70	100	40	100			105	100			90	100
	881017	06					6	100	35	100			14	100			9	100
	881017	08					290	100					400	100			450	100
	881017	14							75	100	100	100			60	100		
	881017	15							70	100	125	100			70	100		
	881017	16					16	100					30	100			40	100
	881018	02					5	100					5	100			6	100
	881018	05							75	100	225	100			325	100		
	881018	09					360	100					500	100			360	100
	881018	15							175	100	250	100			225	100		
	881020	07					2850	100	2100	100	3000	100	2200	100	1850	100	3300	100
	881021	03					14	100					22	100			30	100
	881021	05					10	100					8	100			9	100
	881026	02					1100	99					1300	98			1800	99
	881027	01							1150	100	1400	100			1350	100	2700	100
	881027	03							500	100	1200	100			600	100		
	881027	04							400	100	450	100			375	100		
	881027	12					200	100					110	100			110	100
	881027	15					3150	100	3500	100			2300	100			5200	100
	881110	03							350	100	200	100			220	100		

Table 4B. (continued)

	date	sight no.	obs 4 best est.	obs 4 pct	obs 12 best est.	obs 12 pct	obs 31 best est.	obs 31 pct	obs 55 best est.	obs 55 pct	obs 56 best est.	obs 56 pct	obs 64 best est.	obs 64 pct	obs 67 best est.	obs 67 pct	obs 69 best est.	obs 69 pct
species	10																	
	881014	02							300	60	250	80			325	65		
species	11																	
	881020	02					480	95	1600	80	800	97	1050	85	525	95		
	881110	06					165	25									225	10
	881116	03											195	75			160	79
	881118	03							450	65	400	60			210	50		
	881126	05							170	25	180	20			215	20		
	881126	07					1240	2									1600	1
species	13																	
	881005	02							50	100	40	100			60	100		
	881007	02					15	100					20	100			14	100
	881007	04							40	100	30	100			50	100		
	881007	06															30	100
	881008	02							125	100	200	100			200	100		
	881008	05							25	100	35	100			45	100		
	881009	05							175	100	250	100			200	100		
	881009	07					50	100					40	100			45	100
	881013	03					80	100	70	100			66	100				
	881014	05					70	100					42	100				
	881017	07							65	100	100	100			65	100		
	881017	10							60	100	150	100			80	100		
	881018	04					24	100					34	100			27	100
	881018	07					9	100			25	100	12	100			8	100
	881018	11							25	100	30	100			75	100		
	881019	04					9	100					5	100			7	100
	881020	04							80	100	100	100			65	100		
	881020	05					42	100					85	100			90	100
	881020	06					27	100					75	100			120	100
	881020	10					90	100	85	100								
	881021	01					48	100					120	100			90	100
	881021	02							115	100	175	100			130	100		
	881021	11					170	100	180	100			154	100			420	100
	881022	02					80	100					105	100			85	100
	881022	05							100	100	250	100			90	100		
	881024	04							70	100	100	100			75	100		
	881026	02					1100	1					1300	2			1800	1
	881026	08							35	100	45	100			18	100		
	881026	09							40	100	35	100			20	100		
	881026	11					210	100					175	100			310	100
	881027	06					180	100					135	100			180	100
	881027	10							50	100	40	100			35	100		
	881110	13					50	100	70	100			50	100			60	100
	881112	04					180	100					160	100			340	100
	881113	02							65	100	100	100			60	100		
	881113	03					260	100					195	100			300	100
	881114	01							50	100	160	100			60	100		
	881114	03							12	100	25	100			35	100		

Table 4B. (continued)

	date	sight no.	obs 4 best est.	obs 4 pct	obs 12 best est.	obs 12 pct	obs 31 best est.	obs 31 pct	obs 55 best est.	obs 55 pct	obs 56 best est.	obs 56 pct	obs 64 best est.	obs 64 pct	obs 67 best est.	obs 67 pct	obs 69 best est.	obs 69 pct
species 13																		
	881114	09					45	100					95	100			75	100
	881116	03											195	17			160	20
	881117	01					45	100					65	100			60	100
	881118	02					60	100					80	100			40	100
	881118	03							450	35	400	40			210	50		
	881118	04											13	100				
	881118	08					15	100					42	100			30	100
	881119	02					100	100					200	100			100	100
	881122	01							35	100	70	100			80	100		
	881123	06							50	100	50	100			80	100		
	881125	03					85	100					85	100			110	100
	881125	04					28	100	50	100	100	100	56	100	55	100	35	100
	881125	05							40	100	60	100			40	100		
	881125	07							45	100	65	100			30	100		
	881126	09							70	100	110	100			60	100		
	881127	01					45	100	45	100	95	100						
	881129	01					14	100					18	100			21	100
	881129	03															15	100
	881202	01					45	100					115	100			115	100
	881202	04					22	100					25	100			34	100
	881203	02							100	100	125	100			65	100		
	881203	03					110	100					225	100			130	100
species 15																		
	881119	05							12	100	10	100						
	881121	04							160	99	100	98			110	98		
	881130	01							25	100	30	100			12	100		
	881201	06					9	100					9	100			9	100
species 18																		
	881009	06					5	75										
	881013	02							100	100								
	881028	04							3	100	4	100			8	100		
	881029	01							27	10	20	10			16	5		
	881029	02					10	20										
	881029	09									30	30						
	881029	10					13	100					19	100			16	100
	881108	01					16	100					18	100				
	881109	02							45	100	30	100			35	100		
	881109	03					48	100					60	100			90	100
	881109	10									80	100						
	881110	14					40	70										
	881112	01					33	55					42	55			30	40
	881114	04					6	100					12	100			8	100
	881114	05					12	75									27	73
	881115	06							40	50	40	65			45	40		
	881119	04							45	75					30	60		
	881119	08											28	10			42	23
	881120	02					43	5	37	5	50	4			45	5		

Table 4B. (continued)

			obs 4		obs 12		obs 31		obs 55		obs 56		obs 64		obs 67		obs 69	
	date	sight no.	best est.	pct	best est.	pct	best est.	pct	best est.	pct	best est.	pct	best est.	pct	best est.	pct	best est.	pct
species	18																	
	881125	06					4	100					6	100				
species	21																	
	881009	06					5	25										
	881018	12					5	100										
	881021	07							3	100					4	100		
	881027	05											4	75				
	881029	04									10	100			8	100		
	881030	01							5	100								
	881109	04					8	100					8	100				
	881110	12							11	100	14	100			10	100		
	881110	14					40	30										
	881111	01							8	100	8	100			8	100		
	881111	02															5	100
	881111	03							9	100	7	100						
	881115	04									60	100			35	100		
	881121	01							35	100	30	100			20	100		
	881121	02					3	100					3	100				
	881121	03					11	100					11	100			25	100
	881121	04							160	1	100	2			110	2		
	881121	05					8	100									14	100
	881127	05							4	100								
	881127	06					65	100					34	100				
	881201	05					2	100										
species	26																	
	881126	02					105	100					105	100			80	100
species	31																	
	881007	01					300	100					125	100			300	100
species	32																	
	881123	04			9	100	25	100					12	100				
species	34																	
	881018	13					19	100					15	100				
	881023	03							15	100	17	100			14	100		
	881023	05															7	100
	881027	11					8	100					6	100			5	100
	881029	01							27	90	20	90			16	95		
	881029	02					10	80										
	881029	09									30	70						
	881112	01					33	45					42	45			30	60
	881114	05					12	25									27	27
	881115	06							40	50	40	35			45	60		
	881119	04							45	25					30	40		
	881119	08											28	90			42	77
	881120	02					43	95	37	95	50	96			45	95		
	881120	05					14	100					14	100			12	100

Table 4B. (continued)

	date	sight no.	obs 4 best est.	obs 4 pct	obs 12 best est.	obs 12 pct	obs 31 best est.	obs 31 pct	obs 55 best est.	obs 55 pct	obs 56 best est.	obs 56 pct	obs 64 best est.	obs 64 pct	obs 67 best est.	obs 67 pct	obs 69 best est.	obs 69 pct
species 34																		
	881122	02											22	100			13	100
species 37																		
	881108	04					10	100	17	100			11	100			11	100
	881109	05					2	100					2	100				
	881112	06					15	100	20	100			10	100				
	881120	03					21	100										
species 46																		
	881021	09											7	100				
	881027	14							5	100								
	881108	05					78	100	60	100			135	100			110	100
	881108	07															4	100
	881110	01															1	100
	881110	02													5	100		
	881116	01											1	100				
	881116	02							2	100								
	881116	04					4	100										
	881117	03					1	100									1	100
	881118	01					13	100					16	100			23	100
	881119	06					3	100										
	881119	07					13	100										
species 48																		
	881024	03															1	100
	881111	05							1	100								
	881201	03									1	100						
species 49																		
	881009	09					1	100										
	881018	03					1	100										
	881018	06													2	100		
	881022	06									1	100						
	881023	01															1	100
	881023	06															1	100
	881027	09													1	100		
	881029	07											1	100				
	881110	04									2	100						
	881114	08													1	100		
	881121	08									2	100						
	881123	01													1	100		
	881123	02											1	100				
species 51																		
	881017	04					2	100										
	881017	11									6	100						
	881017	13					2	100										
	881020	03					4	100	4	100			4	100			5	100
	881023	04															4	100

Table 4B. (continued)

	date	sight no.	obs 4 best est.	obs 4 pct	obs 12 best est.	obs 12 pct	obs 31 best est.	obs 31 pct	obs 55 best est.	obs 55 pct	obs 56 best est.	obs 56 pct	obs 64 best est.	obs 64 pct	obs 67 best est.	obs 67 pct	obs 69 best est.	obs 69 pct
species	51																	
	881026	05							1	100								
	881026	10							3	100					3	100		
	881026	13							4	100	4	100						
	881029	03							2	100								
	881108	02					3	100									3	100
	881108	09									3	100			3	100		
	881109	08					4	100					5	100			5	100
	881112	03					3	100										
	881115	01							4	100								
	881115	08													1	100		
	881120	04					4	100					6	100				
	881123	03							1	100								
species	61																	
	881013	01							1	100								
	881018	14											7	100				
	881023	02							1	100								
	881027	08									2	100						
	881110	05					4	100										
	881111	04							5	100					5	100		
	881111	07							4	100	4	100			4	100		
	881117	02							1	100	1	100						
	881120	01					1	100					1	100				
	881124	04					3	100					3	100			3	100
species	70																	
	881009	03					1	100										
	881017	12					1	100									1	100
	881021	04					1	100					1	100				
	881026	12															1	100
	881027	13															1	100
	881111	08							1	100					1	100		
	881114	02							2	100					2	100		
	881114	07													2	100		
	881115	02					1	100										
	881115	03					1	100										
	881115	07							1	100								
	881117	04					1	100									1	100
	881126	01							1	100								
	881126	03													1	100		
	881126	04							1	100								
	881128	03													1	100		
	881128	04							1	100								
	881201	02					1	100										
species	71																	
	881203	04											1	100			1	100

Table 4B. (continued)

	date	sight no.	obs 4 best est.	obs 4 pct	obs 12 best est.	obs 12 pct	obs 31 best est.	obs 31 pct	obs 55 best est.	obs 55 pct	obs 56 best est.	obs 56 pct	obs 64 best est.	obs 64 pct	obs 67 best est.	obs 67 pct	obs 69 best est.	obs 69 pct
species	72																	
	881020	08							2	100					2	100		
	881111	06							1	100					1	100		
	881117	05							1	100	1	100			1	100		
	881129	02					2	100					2	100			2	100
species	75																	
	881021	08							5	100								
species	76																	
	881021	06							2	100	2	100	2	100	2	100		
species	77																	
	881007	05							1	100								
	881009	02					2	100										
	881014	03											1	100				
	881014	04					10	100									70	100
	881016	01											1	100				
	881017	02															50	100
	881017	03					20	100										
	881018	10													7	100		
	881021	12													60	100		
	881022	01															3	100
	881026	03					1	100										
	881027	02							2	100								
	881027	05											4	25				
	881027	07					2	100										
	881028	02															2	100
	881109	09											20	100				
	881112	02															1	100
	881118	05					3	100										
	881127	03															1	100
	881127	04															15	100
	881127	07					6	100										
species	78																	
	881029	06															2	100
	881108	08															1	100
	881116	05					1	100										
	881119	03															1	100
	881121	07															1	100
	881123	05					1	100										
	881124	01							1	100								
	881124	02											1	100			2	100
	881127	08													1	100		
species	79																	
	881113	01													1	100		
	881115	05															1	100
	881115	09							1	100								

Table 4B. (continued)

		obs 4		obs 12		obs 31		obs 55		obs 56		obs 64		obs 67		obs 69	
date	sight no.	best est.	pct	best est.	pct	best est.	pct	best est.	pct	best est.	pct	best est.	pct	best est.	pct	best est.	pct
species 79																	
881118	06											1	100			1	100
species 96																	
881019	01															1	100
881020	01							2	100								
881024	02							1	100								
881026	07									1	100						
881109	06									1	100						
881109	07									2	100						
881110	09											1	100				
881126	06	1	100														
species 98																	
881008	04															1	100
881009	01															3	100
881009	04															1	100
881014	07							1	100								
881020	09											1	100				
881026	04													2	100		
881124	03															1	100

Table 5. Summary of marine mammal sightings encountered in the eastern tropical Pacific during July 28 through December 6, 1988.

species name (scientific name)	species code	species sightings total	pure	mixed	estimated-mean-school-size low /(n)	high /(n)	best /(n)
OFFSHORE SPOTTED DOLPHIN (STENELLA ATTENUATA)	2	35	15	20	139.08(35)	182.66(34)	149.05(34)
SPINNER DOLPHIN (STENELLA LONGIROSTRIS)	3	2	0	2	13.04(2)	14.75(1)	12.35(1)
COMMON DOLPHIN (DELPHINUS DELPHIS)	5	30	28	2	468.87(30)	649.47(28)	555.56(28)
EASTERN SPINNER DOLPHIN (STENELLA LONGIROSTRIS)	10	2	0	2	115.07(2)	160.97(2)	132.27(2)
WHITEBELLY SPINNER DOLPHIN (STENELLA LONGIROSTRIS)	11	29	11	18	89.87(29)	135.23(28)	108.68(28)
STRIPED DOLPHIN (S. COERULEOALBA)	13	90	82	8	59.11(90)	87.37(89)	70.67(89)
ROUGH-TOOTHED DOLPHIN (STENO BREDANENSIS)	15	10	8	2	20.14(10)	26.48(10)	22.94(10)
BOTTLENOSED DOLPHIN (TURSIOPS TRUNCATUS)	18	24	10	14	20.12(24)	32.92(23)	25.45(24)
RISSO'S DOLPHIN (GRAMPUS GRISEUS)	21	24	19	5	10.15(24)	13.59(22)	10.90(23)
PACIFIC WHITE-SIDED DOLPHIN (LAGENORHYNCHUS OBLIQUIDENS)	22	2	1	1	78.50(2)	112.50(2)	80.50(2)
DUSKY DOLPHIN (L. OBSCURUS)	25	1	1	0	6.00(1)	8.00(1)	7.00(1)
FRASER'S DOLPHIN (LAGENODELPHIS HOSEI)	26	2	2	0	312.00(2)	532.00(2)	423.00(2)
UNIDENTIFIED DOLPHIN	77	97	89	8	11.27(91)	51.19(30)	23.84(37)
totals		348	266				

Table 5. (continued)

species name (scientific name)	species code	species sightings total	pure	mixed	estimated-mean-school-size low /(n)	high /(n)	best /(n)
MELON-HEADED WHALE (PEPONOCEPHALA ELECTRA)	31	1	1	0	187.00(1)	300.00(1)	242.00(1)
PYGMY KILLER WHALE (FERESA ATTENUATA)	32	2	1	1	8.24(2)	13.34(2)	10.34(2)
FALSE KILLER WHALE (PSEUDORCA CRASSIDENS)	33	1	1	0	5.00(1)	9.00(1)	7.00(1)
PILOT WHALE (GLOBICEPHALA SP.)	34	24	11	13	11.83(24)	17.43(21)	14.43(22)
KILLER WHALE (ORCINUS ORCA)	37	9	7	2	6.89(9)	9.15(9)	7.46(9)
SPERM WHALE (PHYSETER MACROCEPHALUS)	46	20	19	1	10.24(20)	12.24(17)	10.33(18)
PYGMY SPERM WHALE (KOGIA BREVICEPS)	47	1	1	0	1.00(1)	1.00(1)	1.00(1)
DWARF SPERM WHALE (KOGIA SIMUS)	48	7	6	1	1.43(7)	1.60(7)	1.43(7)
BEAKED WHALE (ZIPHIID)	49	16	16	0	1.31(16)	1.44(16)	1.31(16)
UNID. MESOPLODONT (MESOPLODON SP.)	51	23	23	0	2.83(23)	3.43(23)	2.96(23)
CUVIER'S BEAKED WHALE (ZIPHIUS CAVIROSTRIS)	61	12	12	0	2.50(12)	3.08(12)	2.67(12)
RORQUAL (BALAENOPTERA SP.)	70	27	27	0	1.11(27)	1.23(26)	1.12(26)
MINKE WHALE (B.ACUTOROSTRATA)	71	1	1	0	1.00(1)	1.00(1)	1.00(1)
BRYDE'S WHALE (B. EDENI)	72	7	7	0	2.00(7)	2.14(7)	2.00(7)
BLUE WHALE (B. MUSCULUS)	75	1	1	0	5.00(1)	5.00(1)	5.00(1)
HUMPBACK WHALE (MEGAPTERA NOVAEANGLIAE)	76	3	3	0	2.00(3)	2.00(3)	2.00(3)
UNIDENTIFIED SMALL WHALE	78	18	18	0	1.35(17)	1.18(11)	1.21(14)
UNIDENTIFIED LARGE WHALE	79	8	8	0	1.00(8)	1.14(7)	1.00(8)
UNIDENTIFIED CETACEAN	96	14	14	0	1.21(14)	1.22(9)	1.22(9)
UNIDENTIFIED WHALE	98	22	22	0	1.24(21)	1.32(19)	1.21(19)
totals		217	199				

Table 6. Summary of distance searched, dolphin schools detected, and rates of encountering dolphins by observers aboard the McArthur in the eastern tropical Pacific during July 28 through December 6, 1988.

	Distance Searched (km)	Percent Distance Searched	Number Schools Detected	Percent Schools Detected	Detection Rate (Schools/ 1000 km)	S.E. Detection Rate	Number[1] Days Searched
All Data	12349	100	281	100	22.76	2.22	90
Inshore	2429	20	52	19	21.41	3.69	17
Middle	2589	21	56	20	21.63	5.17	20
West	2549	21	65	23	25.50	4.49	26
South	4781	39	108	38	22.59	5.33	31
Sea State Conditions							
Calm	1213	10	57	20	47.01	7.92	21
Rough	11136	90	224	80	20.11	2.11	86
Visibility Conditions							
Good	10942	89	243	86	22.21	2.43	90
Poor	1407	11	38	14	27.01	4.82	54
Observers							
5	2571	21	18	6	7.00	1.66	39
22	2622	21	4	1	1.53	0.73	39
31	3408	28	32	11	9.39	2.18	49
38	2645	21	23	8	8.70	2.39	41
51	2661	22	21	7	7.89	1.84	41
55	3667	30	45	16	12.27	2.56	48
56	3667	30	25	9	6.81	1.60	48
64	3408	19	26	9	7.63	1.63	49
67	3667	30	16	6	4.36	1.06	48
68	2636	21	23	8	8.73	1.86	41
69	3320	27	31	11	9.34	1.78	48
70	2629	21	17	6	6.47	1.63	39

Table 6. (continued)

	Distance Searched (km)	Percent Distance Searched	Number Schools Detected	Percent Schools Detected	Detection Rate (Schools/ 1000 km)	S.E. Detection Rate	Number[1] Days Searched
Teams[2]							
Team 1	2571	21	38	14	14.28	2.50	39
Team 2	3408	28	89	32	26.12	4.24	49
Team 3	2645	21	67	24	25.33	4.14	41
Team 4	3667	30	86	31	23.45	3.43	48

[1]Day included in tally of searching effort if variable occurred during any part of the day.

[2]Team 1 members were observers 5,22,70; Team 2 members were observers 31,64,69; Team 3 members were observers 38,51,68; and Team 4 members were observers 55,56,67. 57.99nm of trackline was searched when either both or neither of the team leaders were on duty and is not used for team analysis.

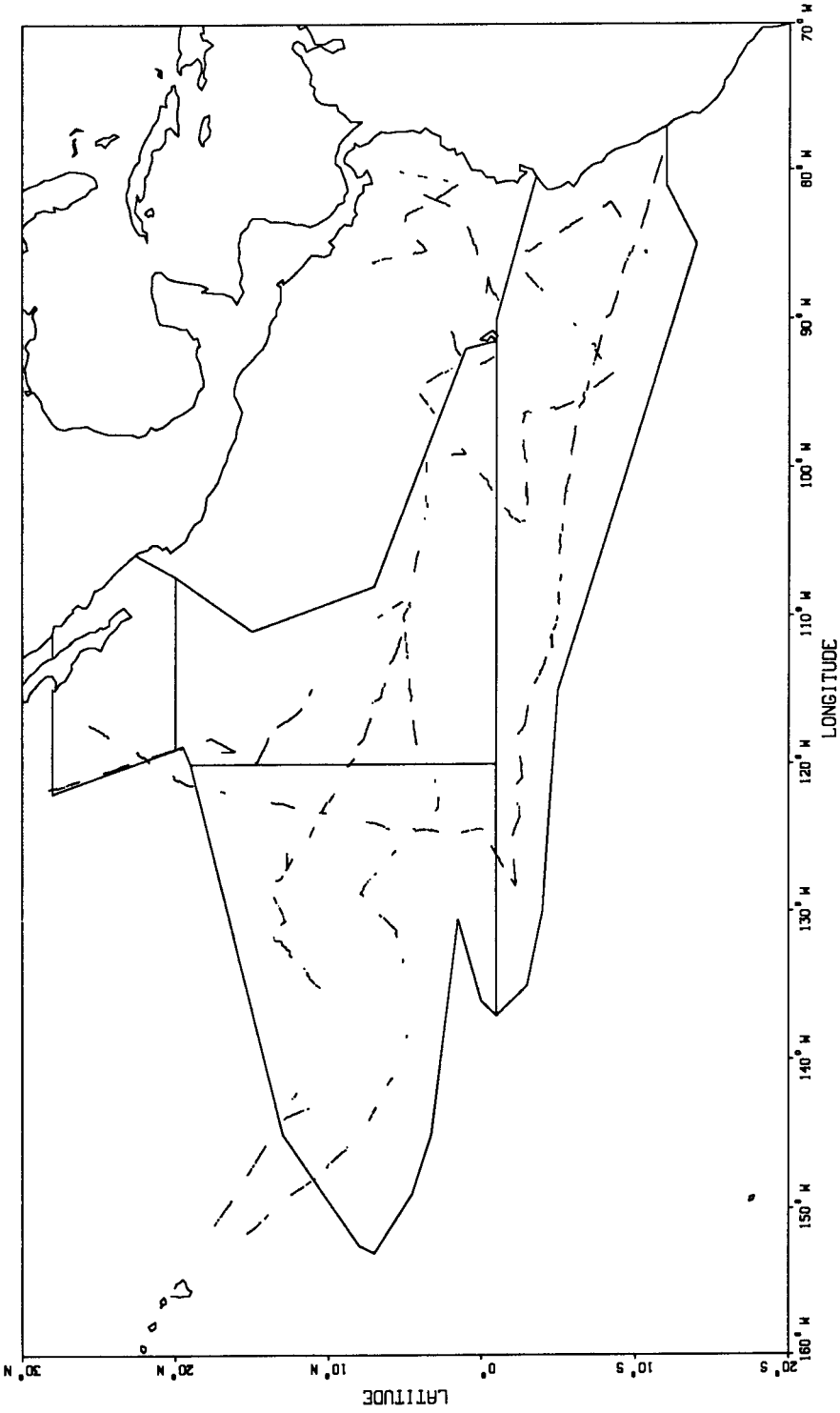


Figure 1. Tracklines surveyed by the NOAA Ship McArthur from July 28 through December 6, 1988, in the eastern tropical Pacific.

CRUISE #	YEAR	MONTH	DAY
1	4	6	8

RESEARCH SHIP MARINE MAMMAL DAILY EFFORT RECORD

		START OF LEG									POSITION: ONE OR MORE PER SERIES				OBSERVER POSITION			
SERIES #	LEG #	TIME	SURFACE TEMP. °F & 10ths	BEAU #	FOG/ RAIN	HORZ SUN	VERT SUN	END OF LEG TIME	COMPASS COURSE °T	VESSEL SPEED KTS & 10ths	LATITUDE	N/S	LONGITUDE	E/W	LEFT BIND.	RIGHT BIND.	REC.	END LEG CODE
10	12	14	18	22	23	24	26	28	32	35	38	42	43	48	49	51	53	55

FOG/RAIN CODES

NO FOG OR RAIN = 1
FOG = 2
RAIN = 3
FOG AND RAIN = 4

ENDING CODES

1 = COURSE CHANGE
2 = SPEED CHANGE
4 = EFFORT TERMINATED
5 = LEG ENDS TO RECORD POSITION IN FOLLOWING LEG
8 = LEG ENDS DUE TO CHANGE IN ENVIRONMENTAL CONDITIONS

Figure 2. Research ship marine mammal daily effort record.

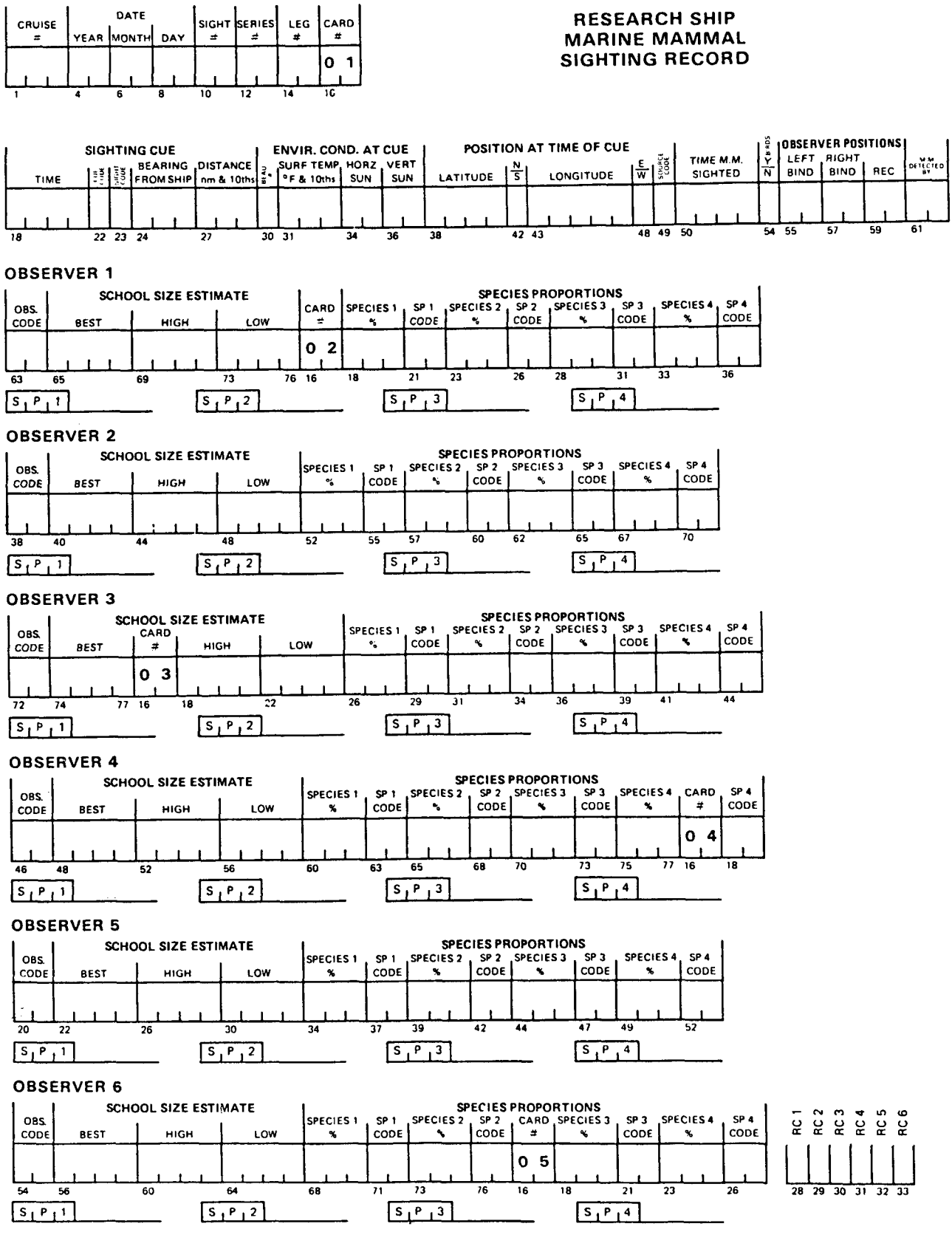
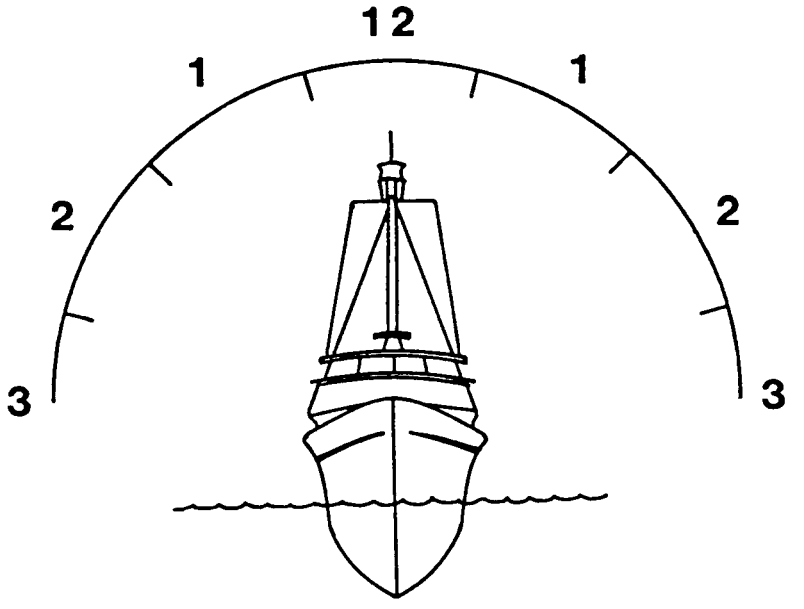
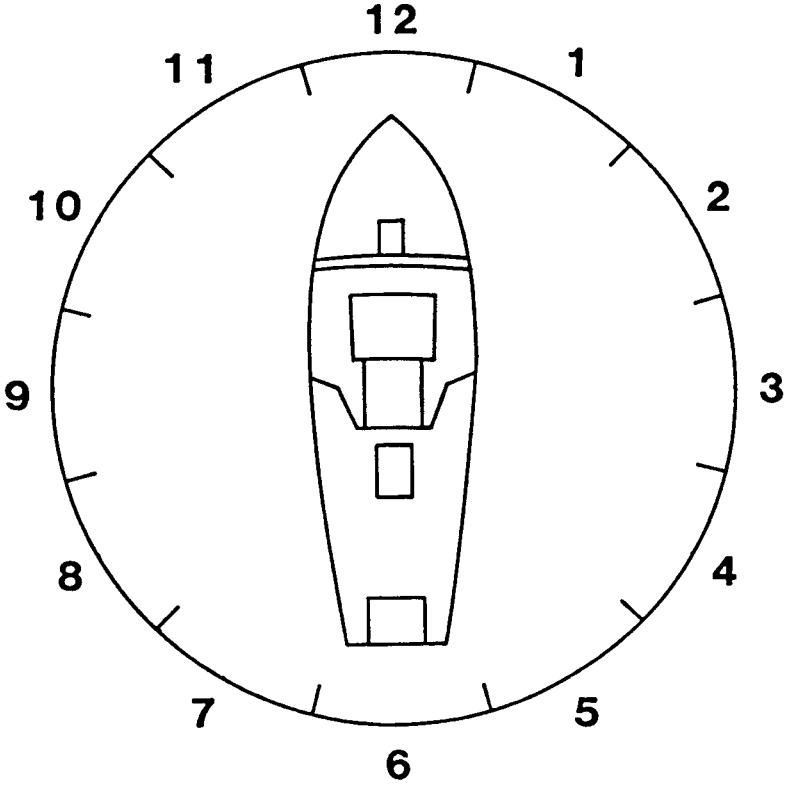


Figure 3. Research ship marine mammal sighting record.



VERTICAL SUN POSITION



HORIZONTAL SUN POSITION

Figure 4. Vertical and horizontal sun position categories.

CRUISE #	DATE YEAR	DATE MONTH	DATE DAY	SIGHT #	SERIES #	LEG #	OBS. CODE
1	4	6	8	10	12	14	16

SIGHTING SUMMARY

LIST ALL DIAGNOSTIC FEATURES OBSERVED
(INCLUDING ESTIMATED BODY LENGTH)

SKETCH FEATURES OF ANIMALS SIGHTED

BEHAVIOR – (DESCRIBE AGGREGATION, MOVEMENT, BOW AND STERN RIDING, BLOWS, ETC.)

ASSOCIATED ANIMALS – (INCLUDE NUMBER AND SPECIES OF BIRDS)

PHOTOS: ROLL # _____

FRAME(S): # _____

TOTAL TIME OF OBSERVATION	_____	ENVIR. COND. (RAIN, OVERCAST, FOG, CHOPPY)	_____	CLOSEST DISTANCE OF OBSERVATION	_____
AMT. OF TIME AT CLOSEST DISTANCE	_____	TAGS ASSOCIATED WITH SIGHTING	_____	METHOD OF OBSERVATION (EYE, 7x, 10x, 25x)	_____

Figure 5. Research ship marine mammal sighting record continuation sheet.

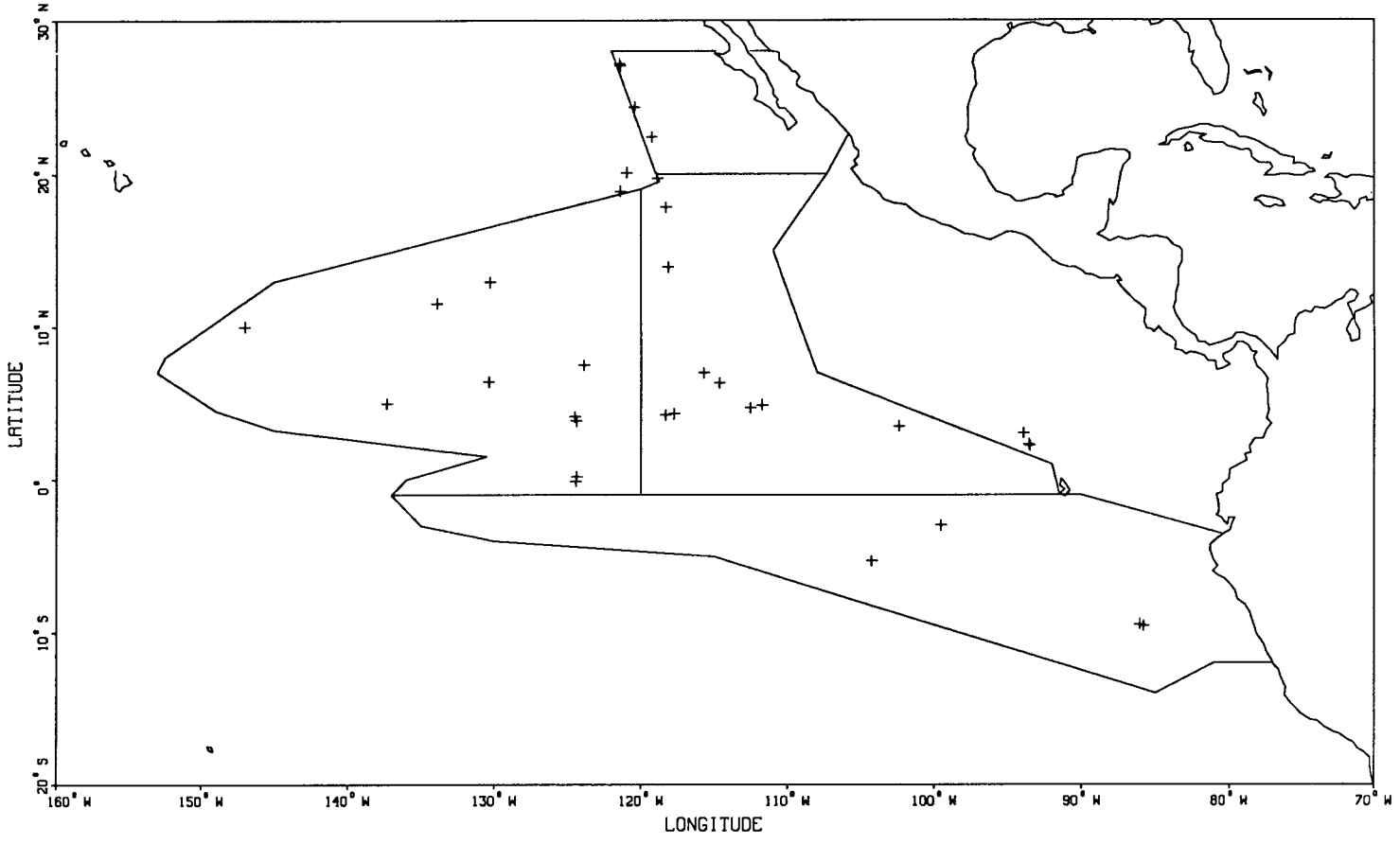


Figure 6. Offshore spotted dolphins (+) detected from aboard the NOAA Ship McArthur from July 28 through December 6, 1988, in the eastern tropical Pacific.

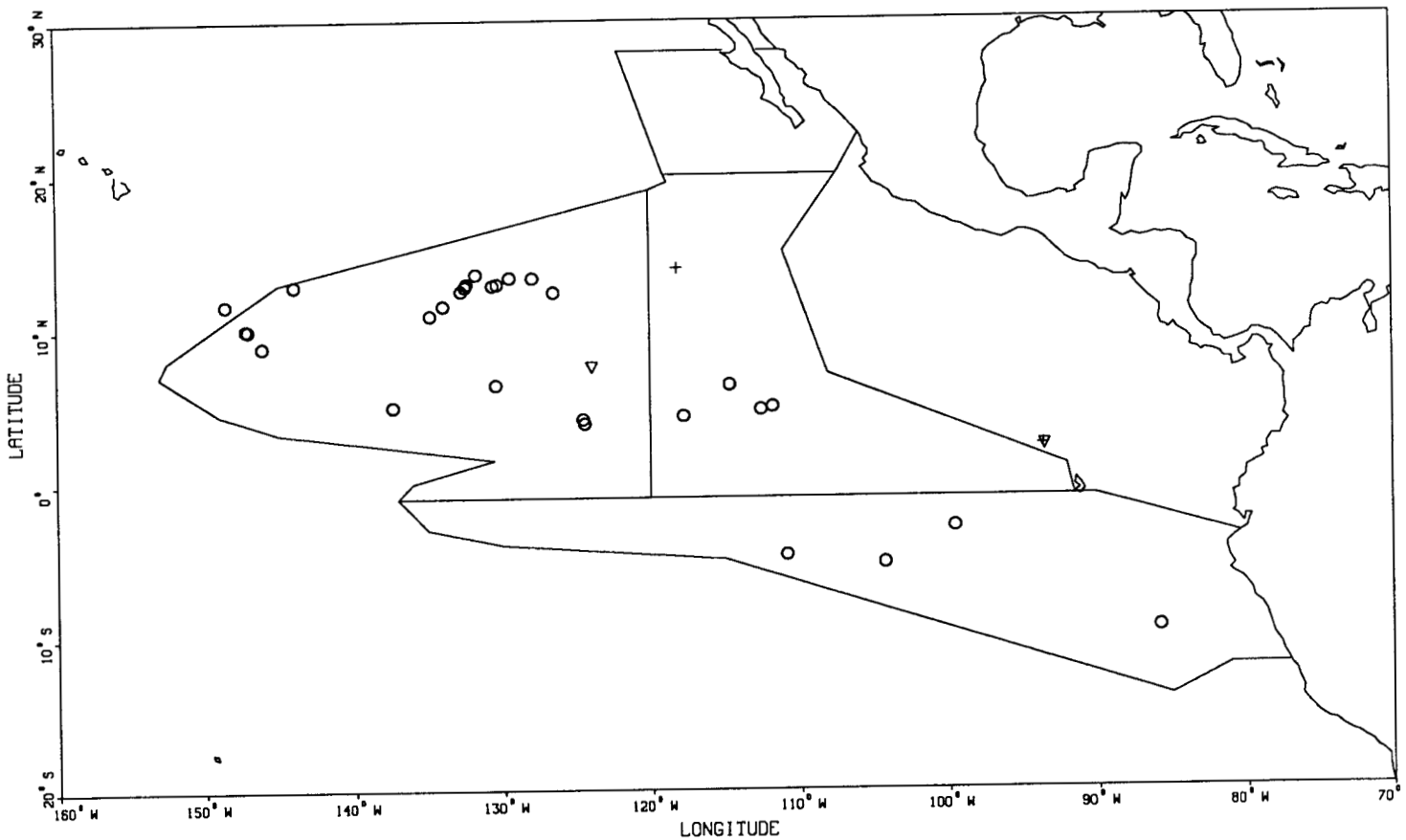


Figure 7. Eastern (+), whitebelly (○) and unidentified (▽) spinner dolphins detected from aboard the NOAA Ship McArthur from July 28 through December 6, 1988, in the eastern tropical Pacific.

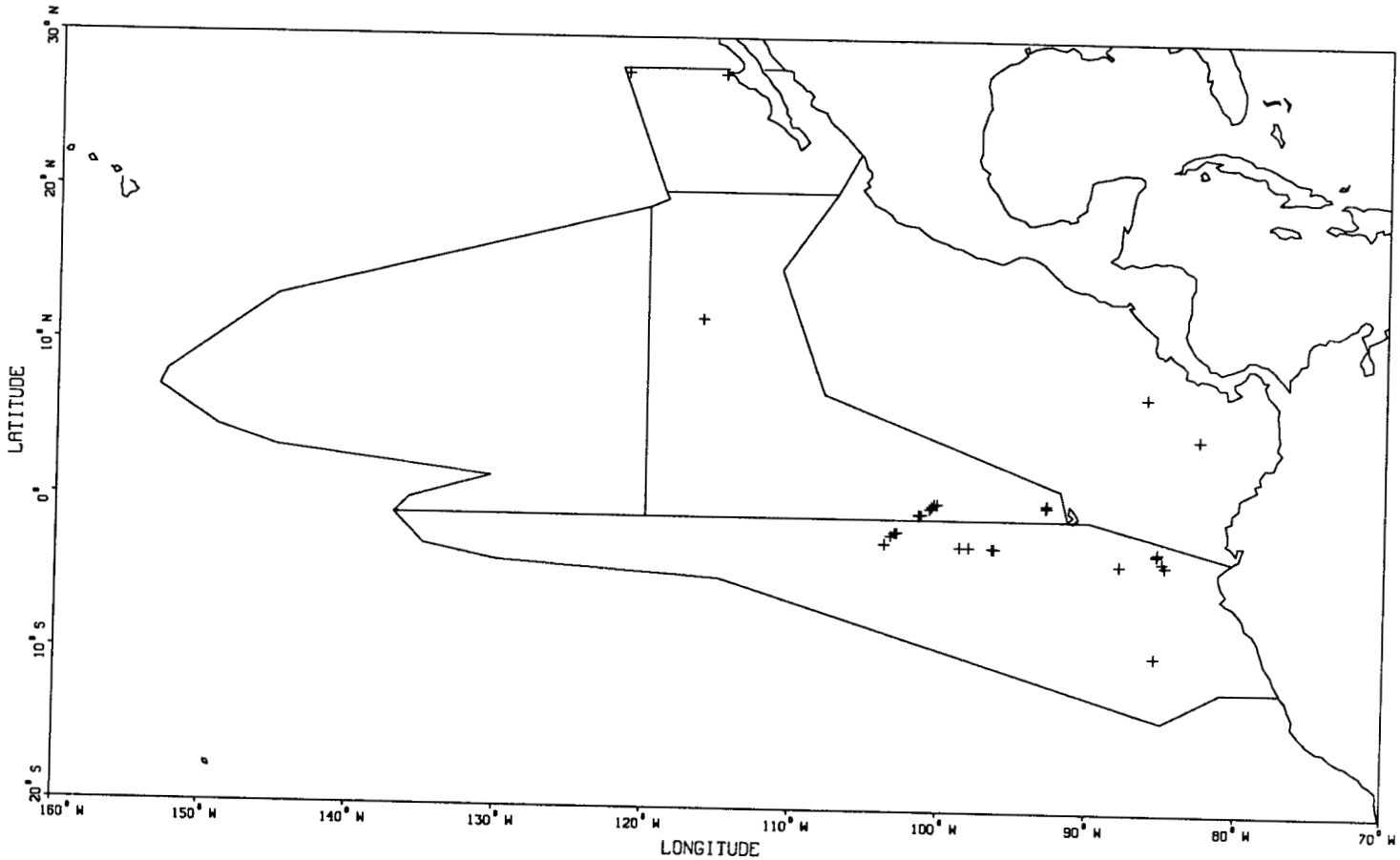


Figure 8. Common dolphins (+) detected from aboard the NOAA Ship McArthur from July 28 through December 6, 1988, in the eastern tropical Pacific.

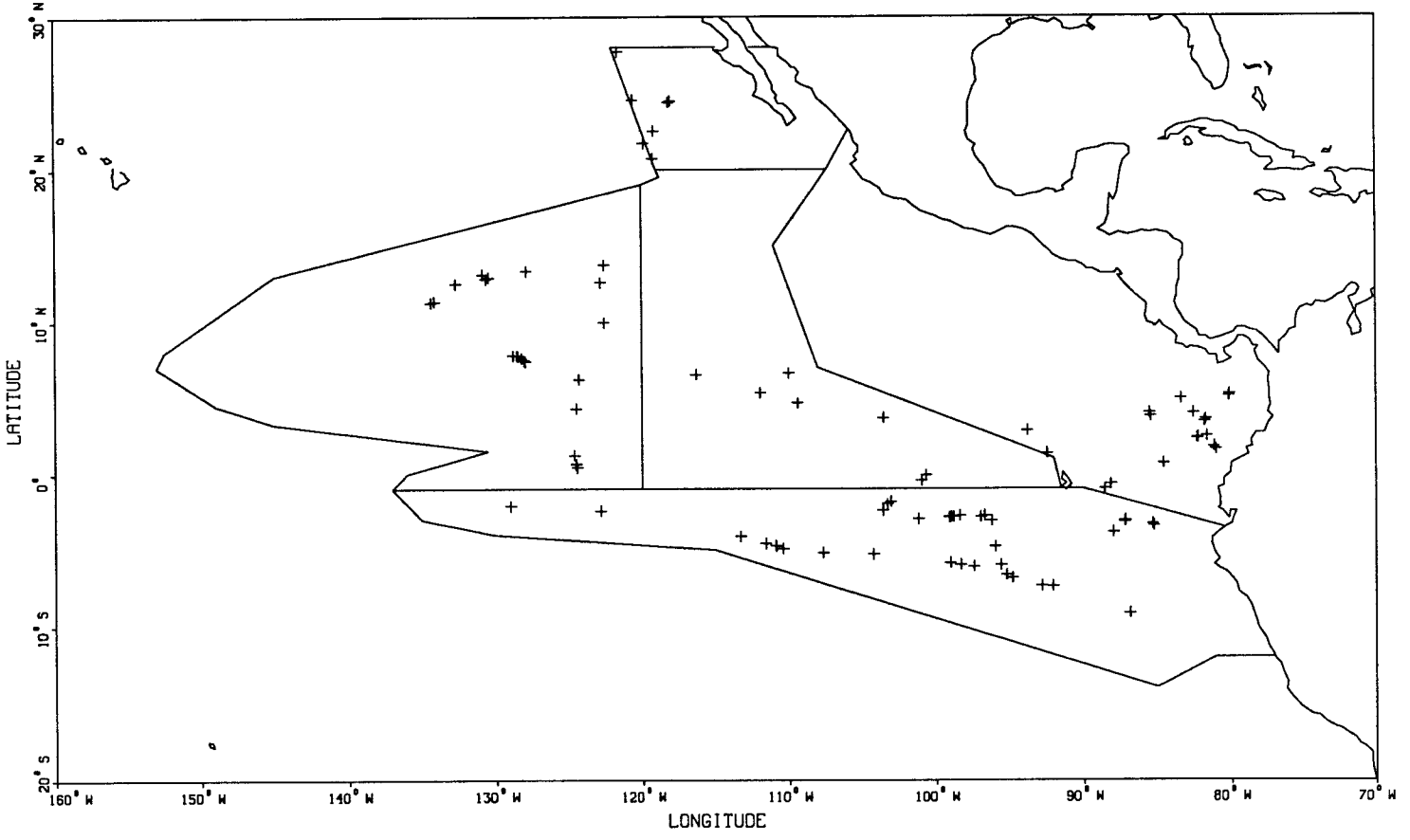


Figure 9. Striped dolphins (+) detected from aboard the NOAA Ship McArthur from July 28 through December 6, 1988, in the eastern tropical Pacific.

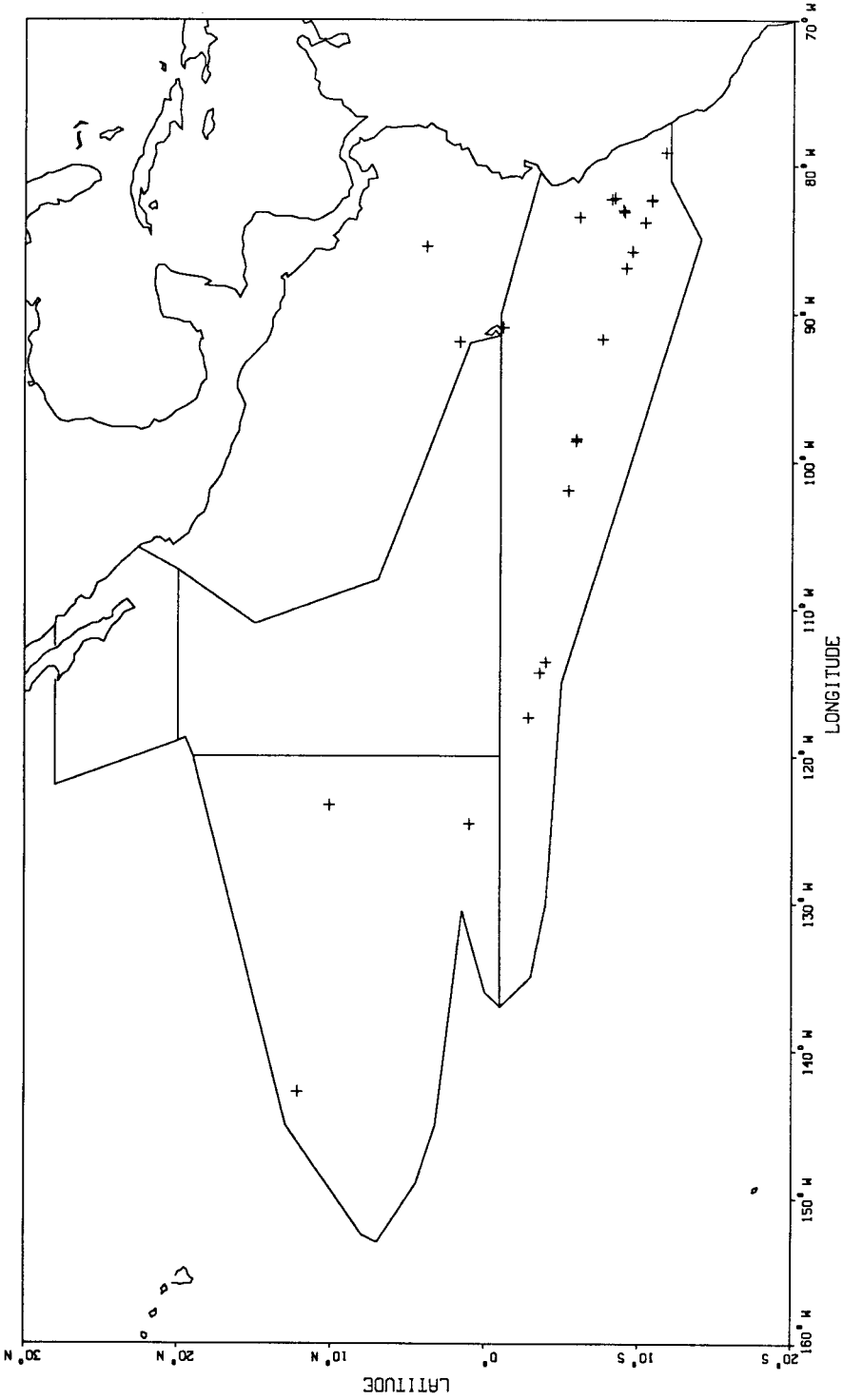


Figure 10. Bottlenose dolphins (+) detected from aboard the NOAA Ship McArthur from July 28 through December 6, 1988, in the eastern tropical Pacific.

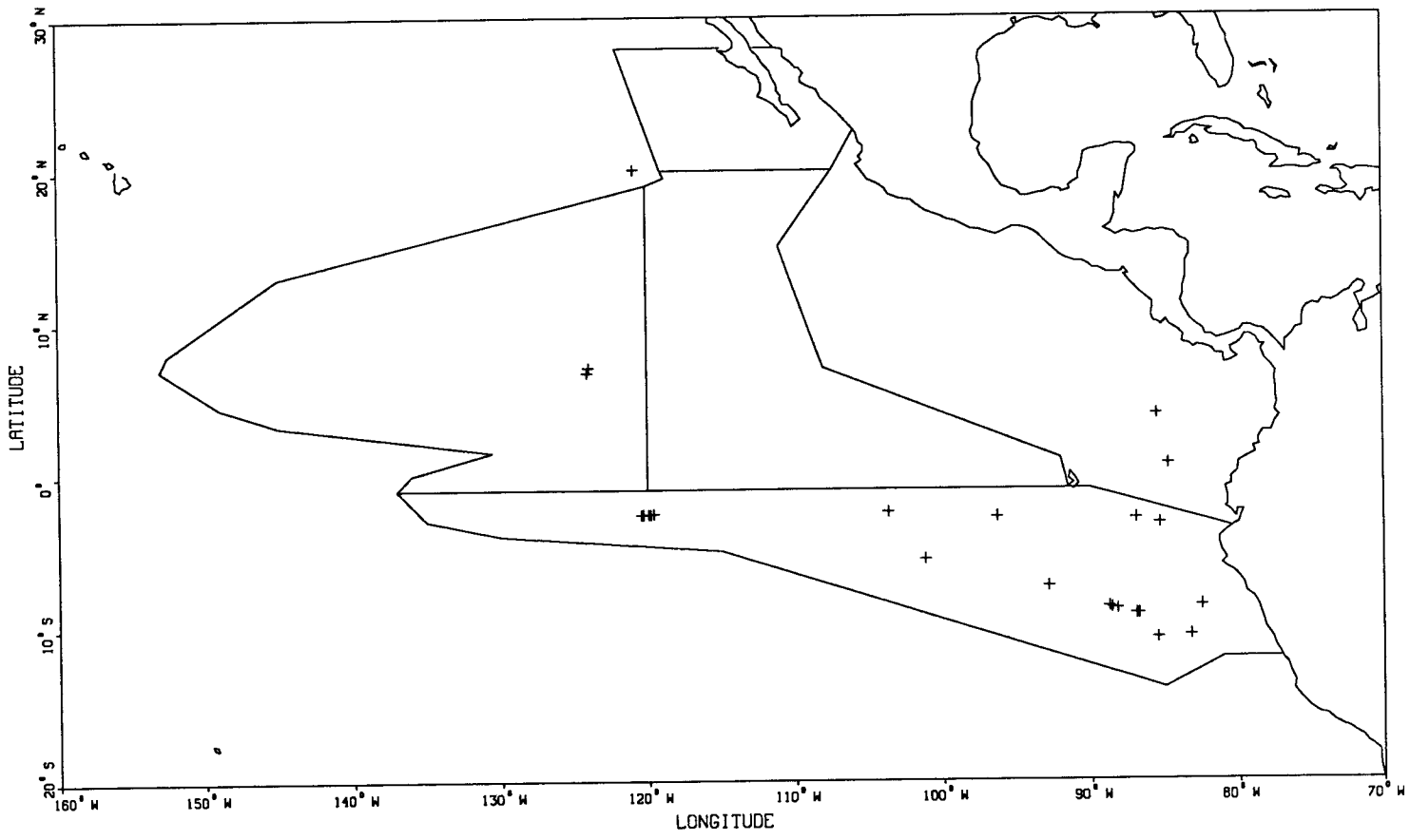


Figure 11. Risso's dolphins (+) detected from aboard the NOAA Ship McArthur from July 28 through December 6, 1988, in the eastern tropical Pacific.

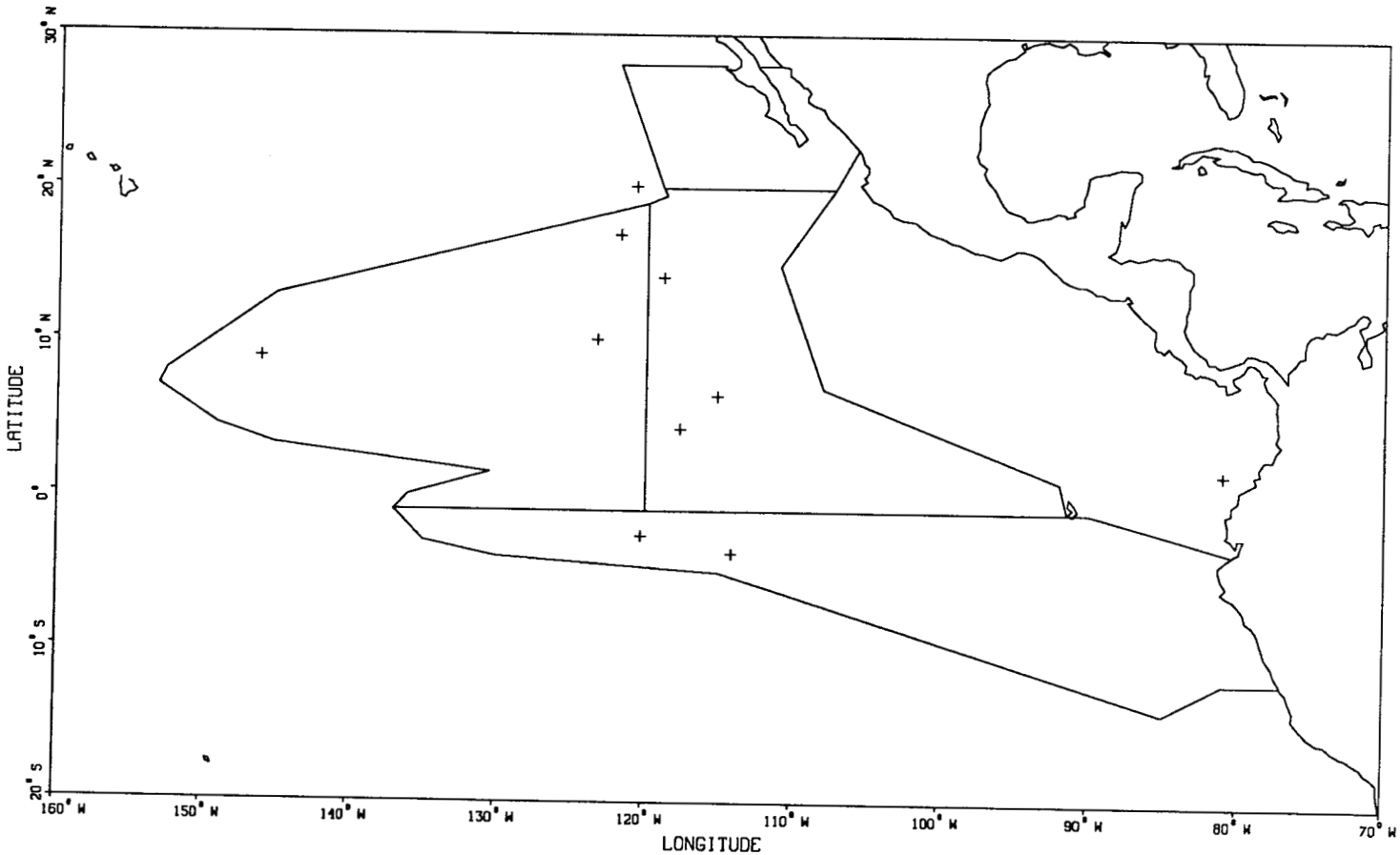


Figure 12. Rough-toothed dolphins (+) detected from aboard the NOAA Ship McArthur from July 28 through December 6, 1988, in the eastern tropical Pacific.

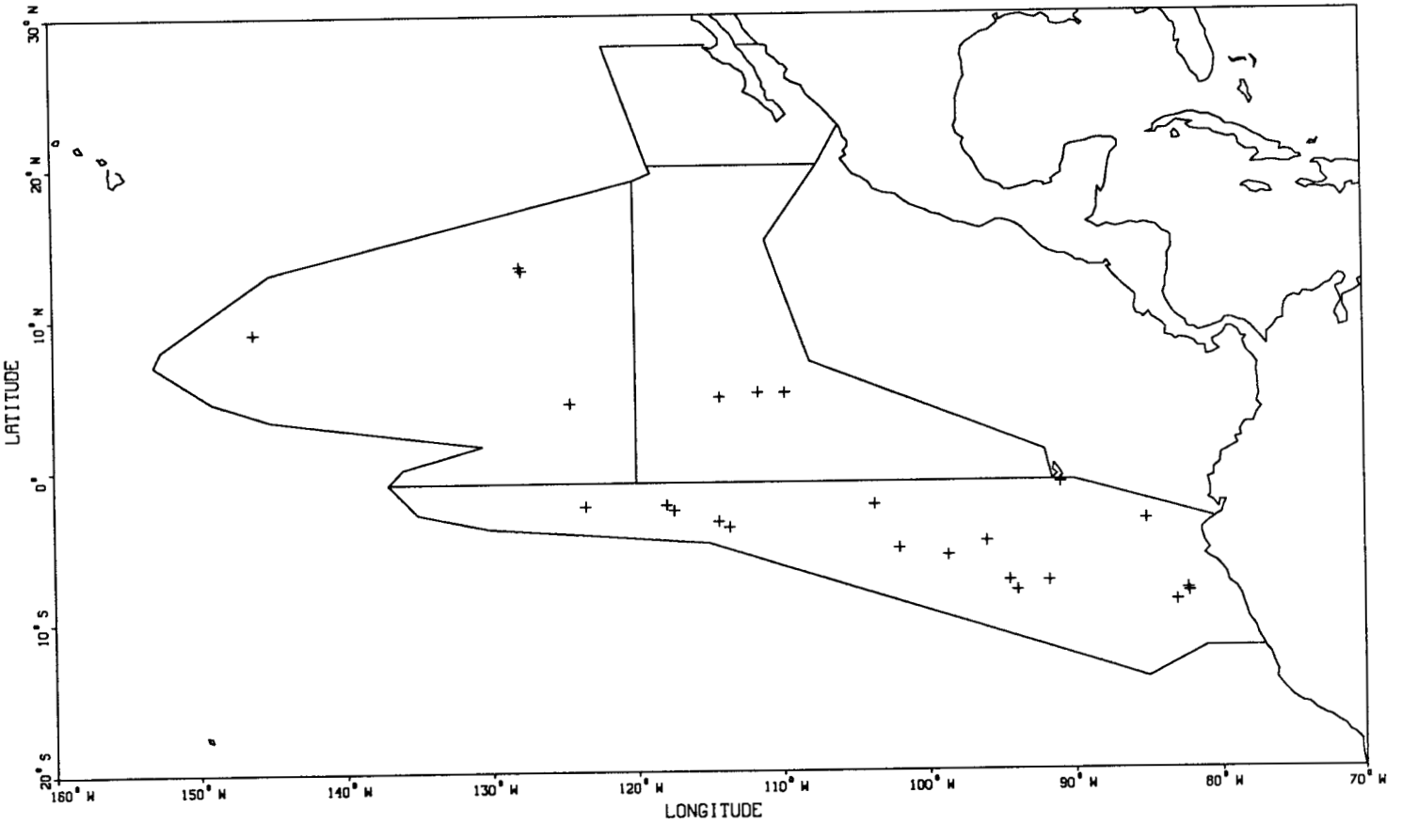


Figure 13. Pilot whales (+) detected from aboard the NOAA Ship McArthur from July 28 through December 6, 1988, in the eastern tropical Pacific.

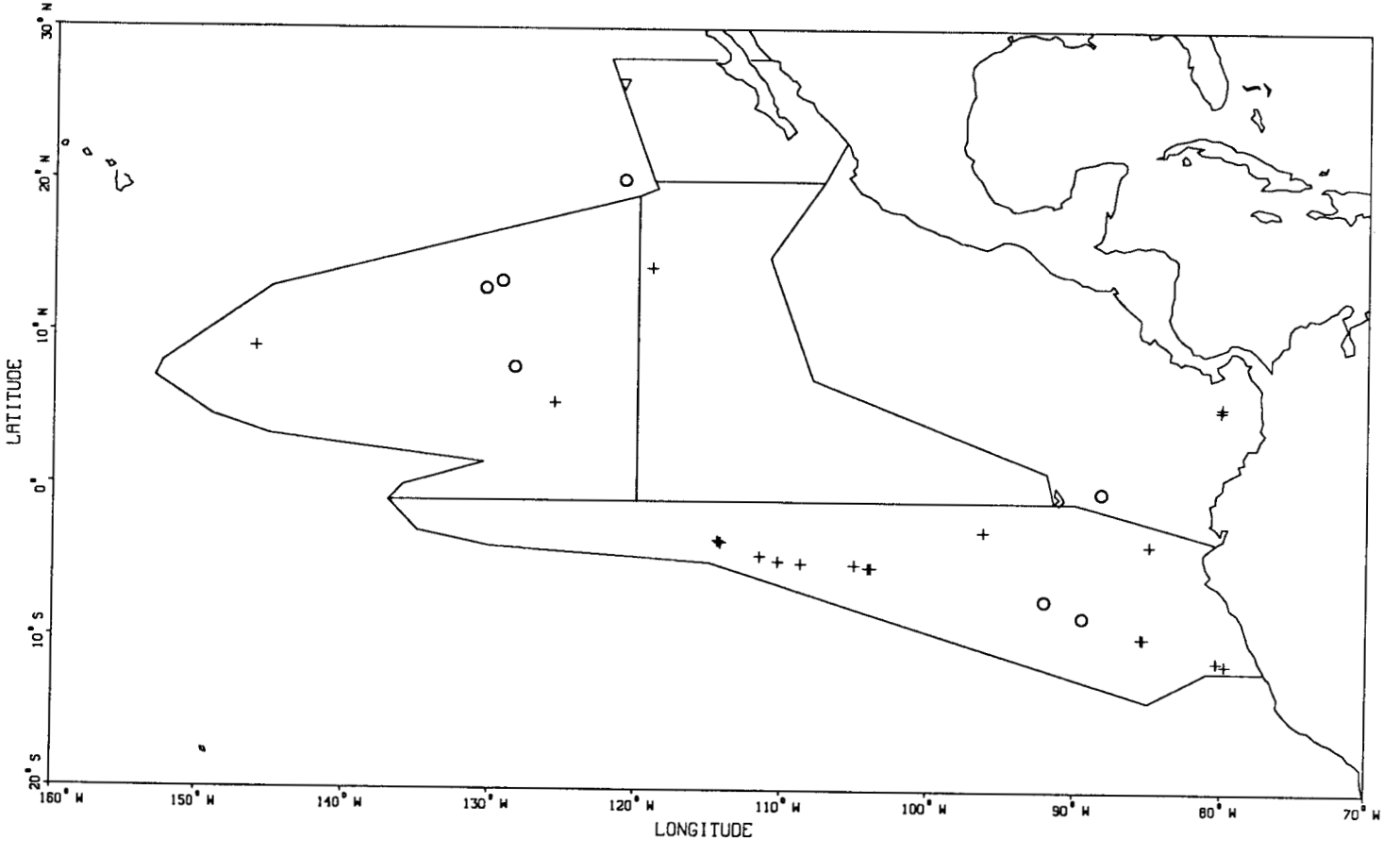


Figure 14. Sperm (+), dwarf sperm (○) and pygmy sperm (▽) whales detected from aboard the NOAA Ship McArthur from July 28 through December 6, 1988, in the eastern tropical Pacific.

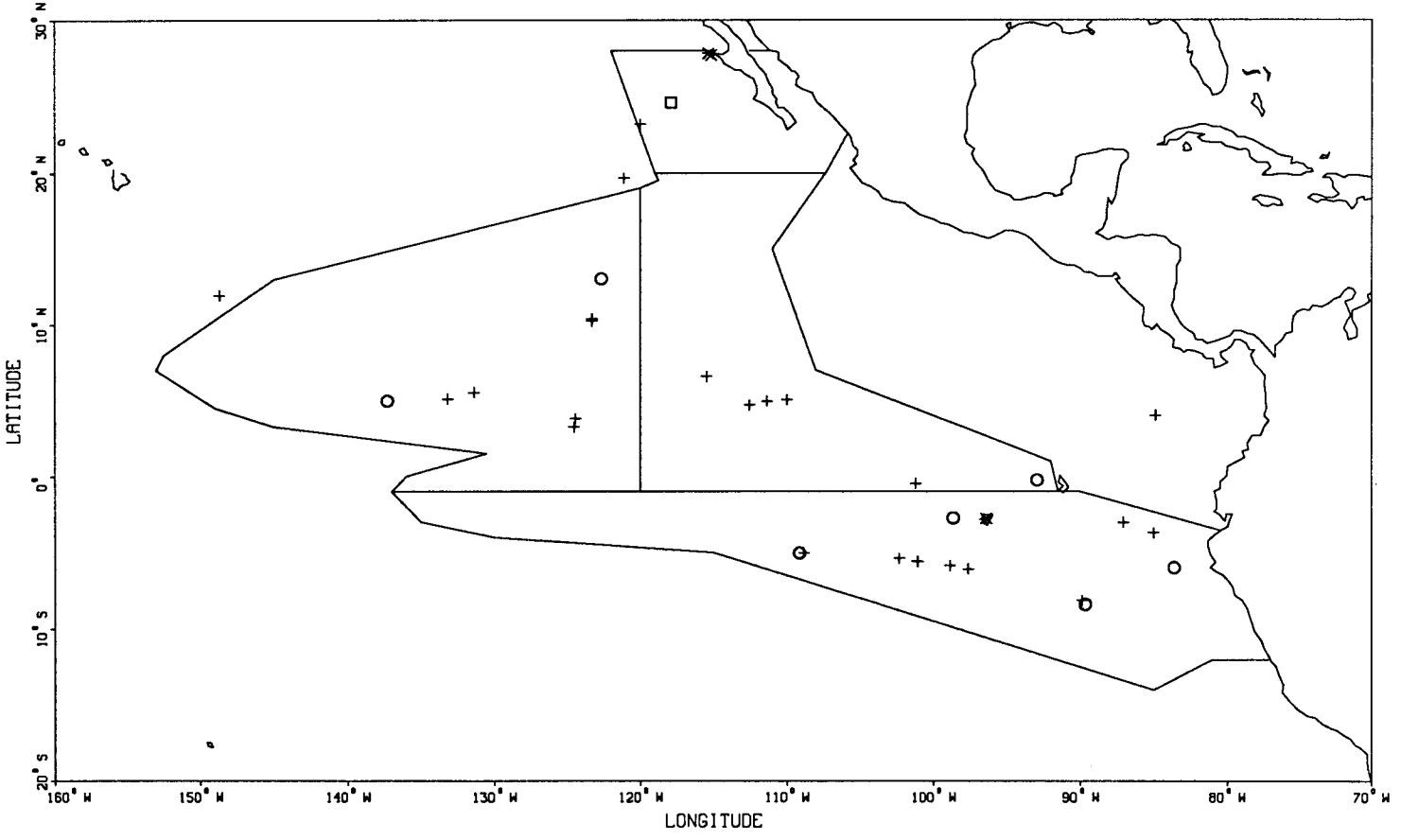


Figure 15. Unidentified rorquals (+), Bryde's (○), blue (▽), minke (□) and humpback (✳) whales detected from aboard the NOAA Ship McArthur from July 28 through December 6, 1988, in the eastern tropical Pacific.

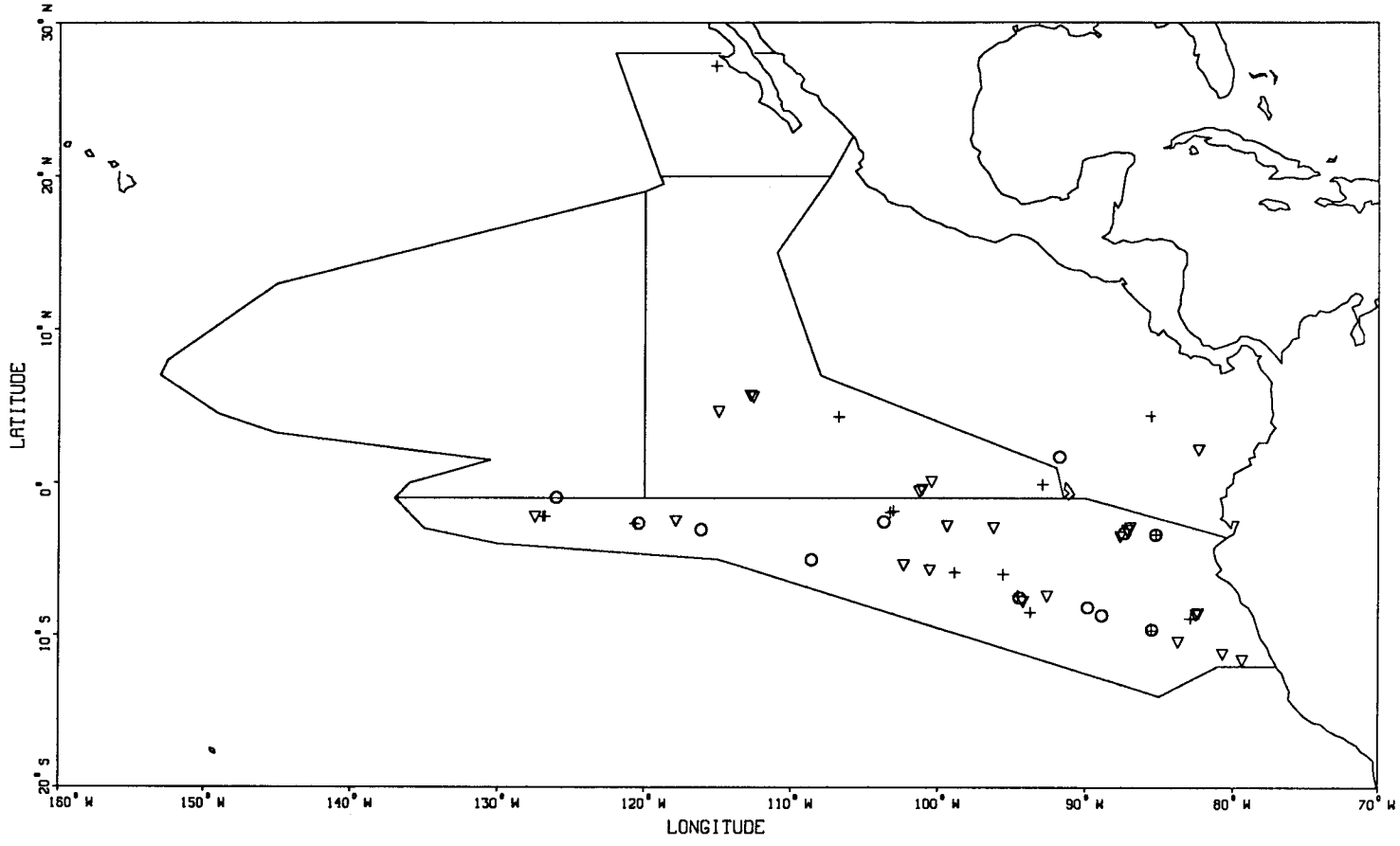


Figure 16. Unidentified beaked (+), Cuvier's beaked (○) and mesoplodon (▽) whales detected from aboard the NOAA Ship McArthur from July 28 through December 6, 1988, in the eastern tropical Pacific.

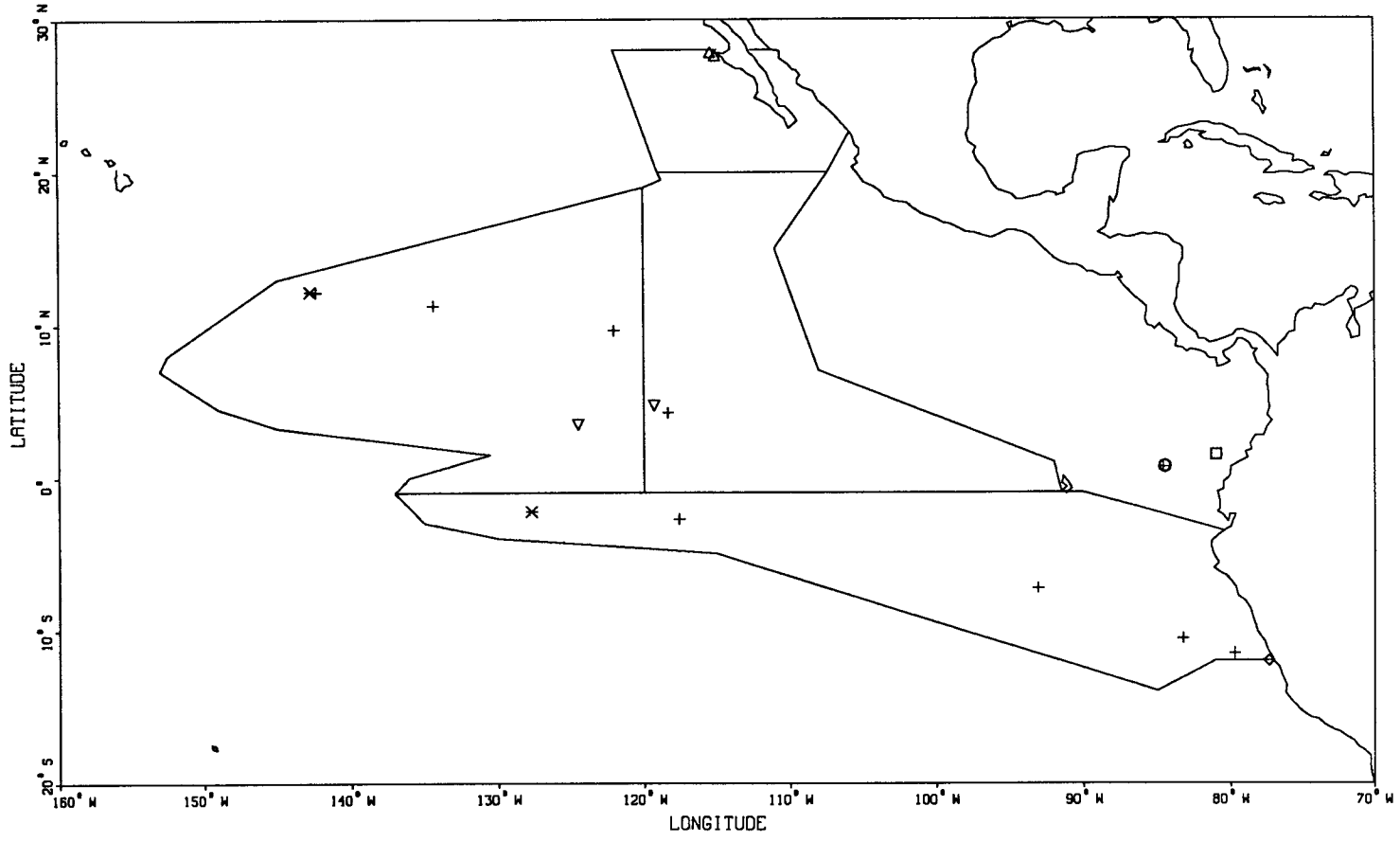


Figure 17. Killer (+) and false killer (o) whales, Fraser's dolphins (▽), melon-headed (□) and pygmy killer (⁕) whales and Pacific white-sided (△) and dusky (◇) dolphins detected from aboard the NOAA Ship McArthur from July 28 through December 6, 1988, in the eastern tropical Pacific.

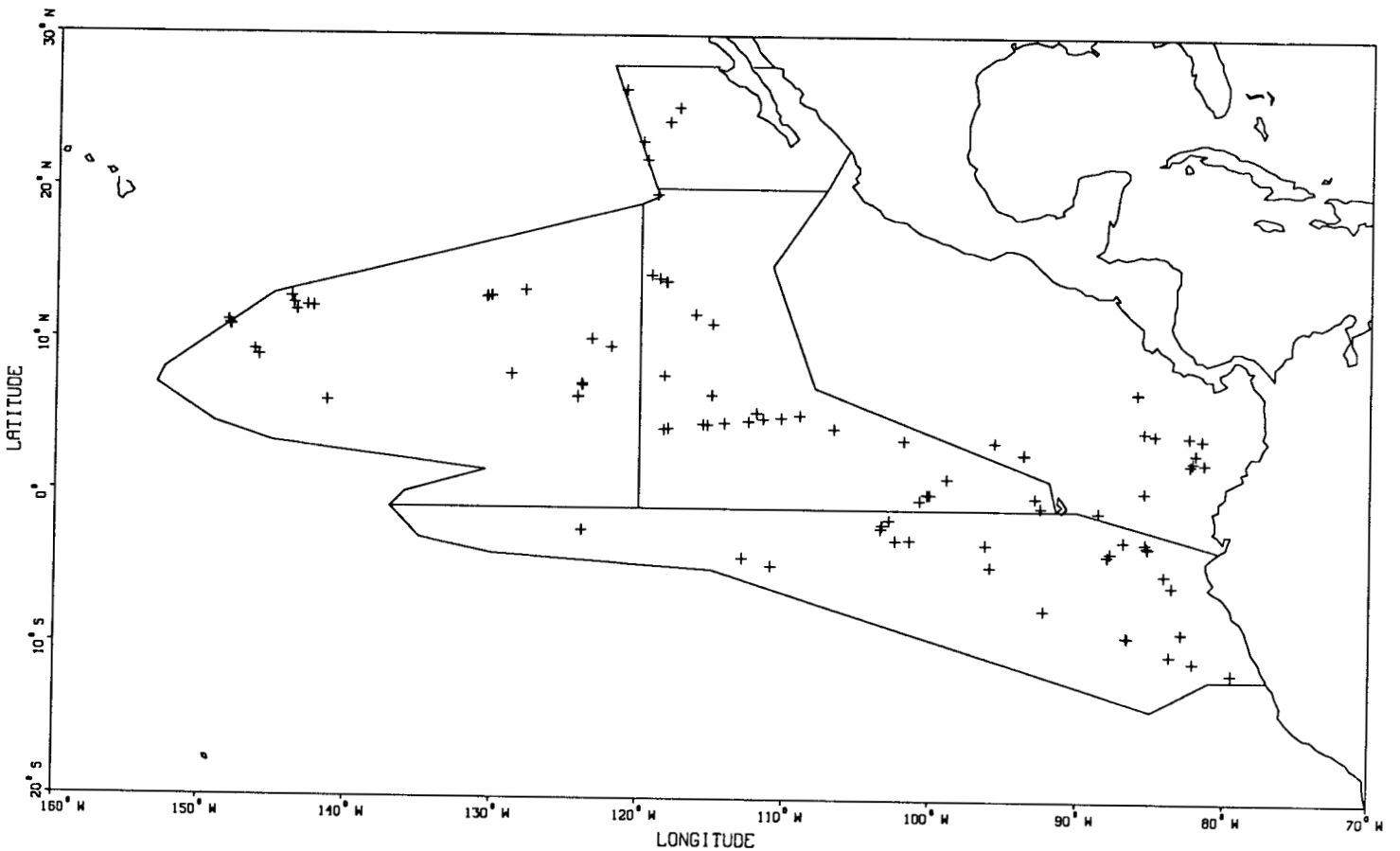


Figure 18. Unidentified dolphins (+) detected from aboard the NOAA Ship McArthur from July 28 through December 6, 1988, in the eastern tropical Pacific.

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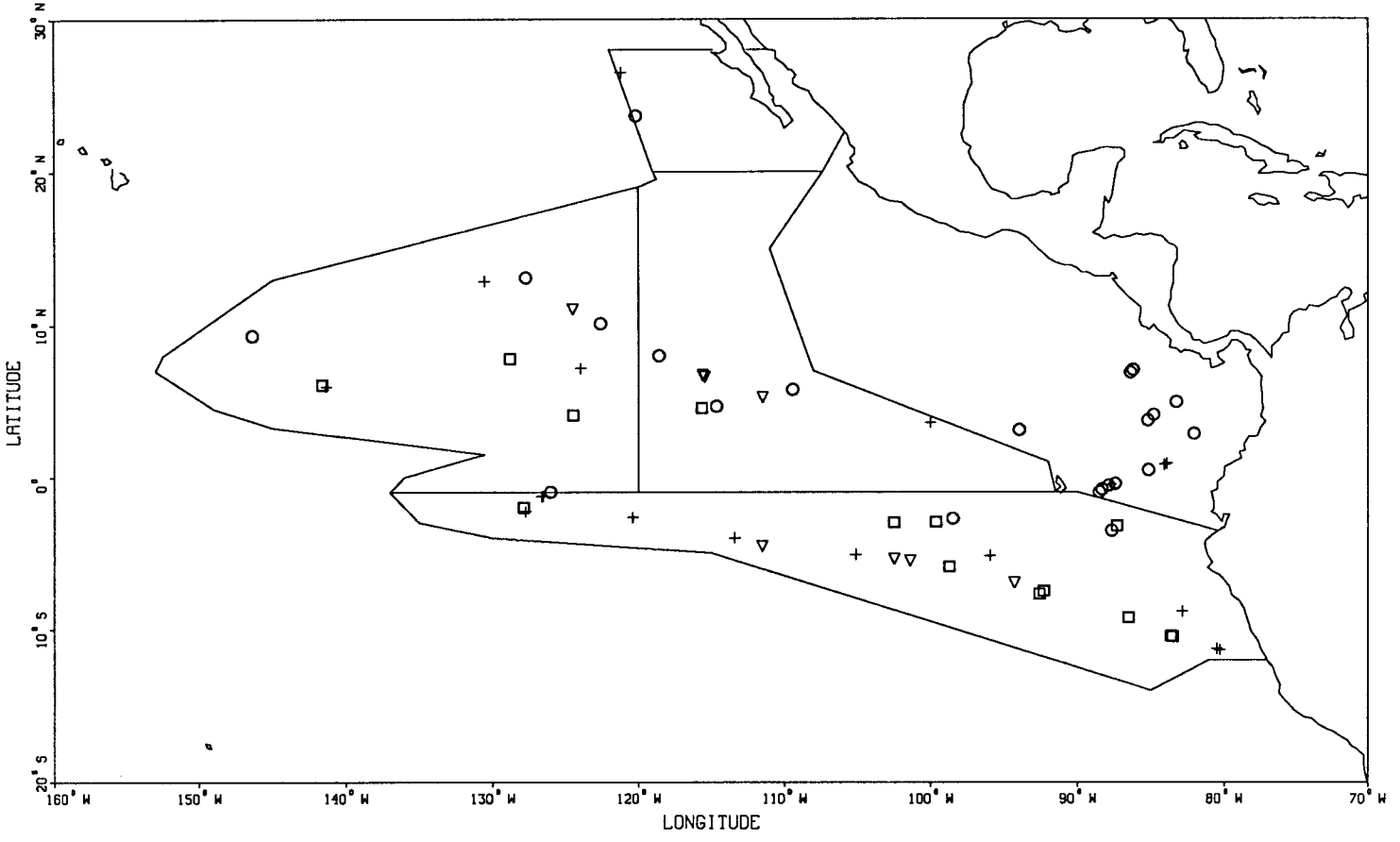

Figure 19. Unidentified small whales (+), unidentified whales (○), unidentified large whales (▽) and unidentified cetaceans (□) detected from aboard the NOAA Ship McArthur from July 28 through December 6, 1988, in the eastern tropical Pacific.

NOAA Technical Memorandum NMFS

The National Oceanic and Atmospheric Administration (NOAA), organized in 1970, has evolved into an agency which establishes national policies and manages and conserves our oceanic, coastal, and atmospheric resources. An organizational element within NOAA, the Office of Fisheries is responsible for fisheries policy and the direction of the National Marine Fisheries Service (NMFS).

In addition to its formal publications, the NMFS uses the NOAA Technical Memorandum series to issue informal scientific and technical publications when complete formal review and editorial processing are not appropriate or feasible. Documents within this series, however, reflect sound professional work and may be referenced in the formal scientific and technical literature.