Documentation for the Marine Mammal Sightings Database of the National Marine Mammal Laboratory

by

G. Christopher Boucher

and

Carolyn J. Boaz

National Marine Mammal Laboratory
Northwest and Alaska Fisheries Center
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
7600 Sand Point Way NE, Bin C15700
Seattle, WA 98115-0070

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INTRODUCTION

The Platforms Of Opportunity Program (POP) was begun in 1975 as part of the U.S. Outer Continental Shelf Environmental Assessment Program.[1] 'Since then the program has solicited marine mammal sightings from observers aboard various types of vessels. The sightings have been entered into a database and the data have been used by researchers to determine the distribution, abundance, and seasonality of marine mammals.

The original documentation for the POP was written in 1978[2] and updated in 1981.[3] We have revised this document with three objectives in-mind:

1. provide instructions for observers submitting data, including details of how to fill out forms;

2. provide instructions for National Marine Mammal Laboratory (NMML) personnel for correct methods of handling the data; including interpretation of the output from the quality control program; and

3. provide a comprehensive listing of the codes used in the data so that anyone requesting data from the project will be able to understand the information.

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[1]Alaska Outer Continental Shelf Environmental Assessment Program, administered by the National Oceanic and Atmospheric Administration under contract to the U.S. Department of the Interior, Bureau of Land Management (contract R7120806).

[2]Mercer, R., B. Krogman, and R. Sonntag. 1978. Marine Mammal Data Documentation for the Platforms of Opportunity Program and Outer Continental Shelf Environmental Assessment Program. NWAFC Processed Report, Northwest and Alaska Fisheries Center, Seattle, WA 98115. 23 p.

[3]Consiglieri, L. D. and G. C. Bouchet. 1981. Marine Mammal Data Documentation for the Platforms of Opportunity Program and Outer Continental Shelf Environmental Assessment Program. NWAFC Processed Report 81-04. Northwest and Alaska Fisheries Center, Seattle, WA 98115. 96 p.

DATA SOURCES

The observers who contribute sightings to the POP have a wide range of experience. Some observers are personnel aboard National Oceanic and Atmospheric Administration (NOAA) and U.S. Coast Guard (USCG) vessels who record sighting data as a part of their duties. Others are experienced marine mammal observers hired by contract and weekend boating enthusiasts reporting occasional marine mammal sightings. All observers use the same data forms. The organizations that currently contribute data to the program are described below.

NOAA, Pacific Fleet

NOAA operates 12 ships from its base in Seattle, Washington. NOAA fleet vessels are frequently used as platforms for sighting surveys conducted by trained observers during major transits across the Pacific Ocean. When a marine mammal observer is not assigned to a vessel, marine mammal sightings are recorded by personnel on bridge watch. These sightings are incidental to the ships' operations. A marine mammal officer is designated on each vessel to coordinate the sighting effort with the NMML. A slide show on marine mammal identification is presented to bridge watch personnel prior to the vessel's departure each spring.

USCG, Pacific Fleet

Over 10 ships in the USCG Pacific fleet are regular contributors to the marine mammal sighting database. Each Coast Guard vessel assigns one quartermaster or marine science technician the responsibility of providing data entry forms and identification materials to the bridge watch personnel. Bridge watch personnel are

trained to identify marine mammals by viewing a slide show on marine mammal identification.

Foreign Fisheries Observer Program

Since 1977, the Northwest and Alaska Fisheries Center's Foreign Fisheries Observer Program (FFOP) has contributed incidental sightings of marine mammals to the POP database. The trained U.S. observers monitor the catch of foreign stern trawlers and longliners in Alaskan and west coast waters and also record marine mammal sightings. A representative from the NMML presents a marine mammal slide show and lecture to each FFOP training class.

Dall's Porpoise Program

Starting in 1978, the governments of Japan and the United States began a cooperative program to study the biology and population dynamics of Dall's porpoise. Since then, trained observers have been placed on Japanese high seas salmon fishery vessels, Japanese squid fishery vessels, Japanese research vessels, and U.S. research vessels to conduct sighting surveys in the North Pacific Ocean.

U.S. Forest Service

Naturalists from the U.S. Forest Service (USFS) have contributed sighting data from southeastern Alaska each year since 1971. In the Whale Watch Program, USFS naturalists show interested ferry passengers how to identify marine mammals common to local waters; while travelling between ports, the passengers then watch for and report sightings of whales to the naturalists.

Other Contributors

In addition to governmental organizations and large-scale efforts, many small groups and independent observers contribute sighting data to the POP.

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CONDUCTING MARINE MAMMAL OBSERVATIONS

All POP sources now use the same sighting forms. Certain parts of the marine mammal sightings forms must be filled out for an observation to be valid. Observers must identify the species and record the number of animals seen, the date, and the location of the sighting. Although the inclusion of animal behavior and environmental data is optional, observers are encouraged to provide detailed descriptions. Observers are cautioned that if their description of a given species is judged inadequate for verifying the sighting, the sighting may be changed to “unidentified whale/pinniped” or discarded altogether.

The sighting forms also have corresponding sighting effort forms for use by NMML personnel or other observers trained in marine mammal identification. Examples and instructions for both sighting and effort forms are found in this section.

Instructions for Filling out Sighting Forms

The following explains how to complete each entry on the Marine Mammal Sighting Form (see Figure 1). When you are filling in the boxes, the last digit of your number should be in the last box on the right, and any empty boxes to the left of the number should be filled in with zeroes. For example, if your observed angle from the bow is 45^{o} of Figure, fill in boxes 47-49 with 045. Do not fill in boxes that are preceded by an asterisk.

1. NAME — Print the name of the observer and vessel in the upper left-hand corner of the log.

2. DATE — Note proper sequence (year/month/day) for the date of the sighting.

   TIME — Log the time of the sighting when you first see the animal. Use local ship time and military form. See item 16 for recording the time zone (boxes 61-63).

3. LATITUDE — Record the latitude to the tenth of a minute if you obtained it from a satellite navigation or Loran system, or to the nearest minute it dead reckoned. Place N or S in box 23 depending on which side of the equator the sighting occurred.

4. LONGITUDE — Record the longitude to the tenth of a minute if you obtained it from a satellite navigation or Loran system, or to the nearest minute if dead reckoned. Place E or W in box 30 depending on which side of the 180th meridian the sighting occurred.

5. SPECIES — Print both the common and scientific names (Table 1) of the animals. If you sight more than one species at the same time, fill out a separate sighting form for each species and note the association (if any) in the comments section (Col. 65-80). For example, if you sight a mixed school of Dall's porpoise and Pacific white-sided dolphins, fill out one sighting form for each species and in the comments section of the Dall's porpoise sighting record "MIXED SCHOOL WITH LO" and in the comments section of the white-sided dolphin sighting record "MIXED SCHOOL WITH PD." Do not enter a species name unless you are absolutely positive. If you are the least bit unsure of the animal's identity, record it as "unidentified large whale," "unidentified porpoise," etc. Remember that an erroneous identification is worse than none at all. You

might give your "best guess" and explain why you think it might be that species and not another. On the back of the sighting form note and circle the characteristics you used to make your identification.

When attempting to identify a marine mammal, look for:

Shape and size of the dorsal fin and its location on the body. If possible, also note size and shape of the tail and flippers.

Length. It is difficult to estimate the size of aquatic animals, so compare unfamiliar animals with a species with which you are familiar. For example, "about the size of a pilot whale" or "slightly smaller than a bottlenose dolphin."

General shape of body (slender or robust).

Shape and size of snout. Is it long or short (record estimated length in inches)? Is there a definite break between snout and forehead? Is the forehead markedly bulbous?

Color pattern on fins and body (stripes, spots, patches, mottling, etc.).

Shape, location, and direction of spout. Is it single or double? Where is the spout located on the head? Does it lean forward or go straight up?

Scars and scratch marks.

Dive times. How much time was spent between dives; how many blows occurred before diving; what was the general shape of the blow (e.g., tall and thin or short and fat), and did the animal show its flukes when diving?

6. NUMBER SIGHTED — If you cannot count the animals, estimate the number seen in terms of a range (e.g., 5 + 1). Code the number into boxes 37-40 and the range into box 36 using codes from Table 2.

7. INITIAL SIGHTING CUE — Record the primary sighting cue observed. Behavior codes are in Table 3. Additional notes on behavior can be made in the comments field.

8. ANGLE FROM BOW — Concentrate on the area from amidship forward to the bow on both sides. Pay particular attention to recording the sighting at the animal's initial location with reference to the transect line,.

Occasionally animals approach vessels from the stern, so quickly scan the area aft of the beam every few minutes. Consider the ship a 360º circle when recording sighting angle; dead ahead is 000º; starboard is 90°; port is 270º; and dead astern is 180º. Round the sighting angle to the nearest degree.

9. INITIAL SIGHTING DISTANCE — Record the distance between the ship and the sighting in nautical miles, yards, or meters--whichever you are most comfortable with. Convert to 10's of meters and place in boxes 50-52. Remember that all boxes are right justified (e.g., 100 meters = 010 in boxes 50-52).

10. VISIBILITY — Note how far you can see in kilometers (or miles) if the weather is good, or in meters if the weather is poor (e.g., fog).

11. SEA STATE — Use the Beaufort Scale (see Table 4).

12. VISIBILITY CODE — Use visibility codes in Table 5. Note that this code is a synthesis of visibility, sea state, and weather, and reflects your ability to see the animals.

13. WEATHER — Note weather conditions (rain, fog, blue skies, overcast, etc.).

14. SURFACE WATER TEMP. — Record the temperature in degrees' Celsius in boxes 55-56 rounded off to the nearest whole degree. If below freezing, place a minus (-) in box 54. The temperature can be obtained from the ship's engine inlet thermometer (see Table 6 for Fahrenheit to Celsius conversion).

15. PLATFORM CODE — See Table 7 for platform codes for box 57 and Table 8 for list of source codes for boxes 58-60.

16. TIME ZONE — Enter a plus (+) or minus (-) in box 61 and the time zone in boxes 62-63.

17. COMMENTS — This section is one of the most important parts of the record. Everything relevant to your identification of the animal should be entered. Be liberal with sketches. Use as much room as you need to get everything down. In addition to details of the animal's appearance, note the kinds and numbers of other associated animals (fish, birds, squid, mammals, etc.) and their behavior.

Whenever you identify a species, note the characteristics on which you based the identification (e.g., Sperm whale--35 ft. long, large square head, no snout, no dorsal fin, spout at end of head and angled forward).

Be generous with narrative about animal behavior. If there are several animals, are they in a tight school, a loose school, or scattered either singly or in small groups? Do the animals approach the vessel and ride the bow wave? Note their diving behavior. How many times do they blow when they come to the surface? Do they raise their tail flukes out of the water when they dive after their last blow? How long do they stay down between each series of blows? Do they leave "tracks" or swirls on the surface when they are submerged? Do they jump (breach) clear of the water? If so, do they jump in a smooth arc or do they sometimes belly-flop, somersault, or spin?

MARINE MAMMAL SIGHTING FORM
* DO NOT FILL IN BOXES PRECEDED BY AN ASTERISK

1. OBSERVER NAME Lew Consiglieri
VESSEL NAME MILLER FREEMAN
RECORD ID * 1 8 6 0 7 0 (1 2 3 4 5 6)

2. DATE (Yr./Mo./Day) & TIME (local) OF SIGHTING
YR MO DAY: 8 6 0 3 1 4 (7 8 9 10 11 12)
1 0 4 0 (13 14 15 16)

3. LATITUDE (degrees/minutes/10ths)—N/S
5 7 5 4 . 4 (18 19 20 21 22) N (23)

4. LONGITUDE (degrees/minutes/10ths)—E/W
1 5 4 1 4 . 1 (24 25 26 27 28 29) W (30)

5. SPECIES Sperm Whale (Common name) Physeter macrocephalus (Scientific name)
P M (33 34)
TENATIVE * (35)

6. NUMBER SIGHTED 3 ± 0
* C.I. 0 (36)
0 0 0 3 (37 38 39 40)

7. INITIAL SIGHTING CUE Blows through binoculars
* 0 1 (45 46)

8. ANGLE FROM BOW 0 3 0 (47 48 49)
9. INITIAL SIGHTING DISTANCE 1000 m
10's of meters 1 0 0 (50 51 52)

10. VISIBILITY 15 nm
11. SEA STATE (Beaufort) 1
12* VIS CODE 2 (53)

13. WEATHER Ptly. Cloudy
14. SURFACE WATER TEMP.(°C) ± + (54) 0 5 (55 56)

15. PLATFORM CODE * 1 0 0 6 (57 58 59 60)
16. TIME ZONE ± + (61) 1 0 (62 63)

17. How did you identify animal(s)? Sketch and describe animal; associated organisms; behavior (include closest approach); comments.

Animals came within 1/2 Km of vessel. Clearly able to see square head + wrinkled skin. Blows were oblique Two animals were around 35' long; the other larger (~ 50'?).

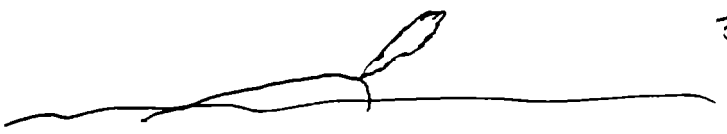
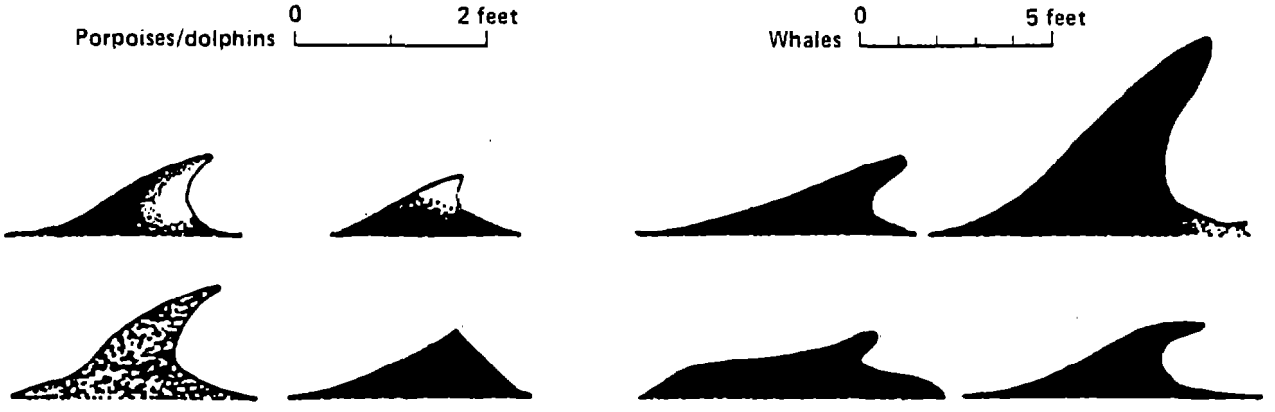


Figure 1.--Marine mammal sighting form (front).

65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80

To aid in your identification of whales and porpoises, circle the characteristics corresponding to the features you observed.

Body length (estimation):	< 10 feet	10–25 feet	25–50 feet	50–80 feet
Dorsal fin?	Yes	No		
Shape of dorsal fin:				



Prominent blow?	Yes	No	
Number of blows before a long dive:	1–3	4–7	8–15
Length of dive:	⩽ 2 minutes	5–7 minutes	10–20 minutes
Shape of blow:			

or longer - they douc t we lost sight of them.

Showed flukes upon dive?	Yes	No	
Other behavior characteristics:	No specific behavior	Bow riding	
	Following vessel	Slow rolling	
	Breaching	Porpoising	
	Stern riding	Other _____	

Distinctive markings (scarring, white patches, etc.):

Figure 2.--Marine mammal sighting form (back).

Table 1.--Common and scientific names and corresponding codes for marine mammals reported by Platforms of Opportunity Program observers. Names are spelled as found in Rice.[1]

Code	Common name	Scientific name
	Pinnipeds	
CU	Northern fur seal	*Callorhinus ursinus*
EB	Bearded seal	*Erignathus barbatus*
EJ	Northern sea lion	*Eumetopias jubatus*
MA	Northern elephant seal	*Mirounga angustirostris*
OR	Walrus	*Odobenus rosmarus*
PF	Ribbon seal	*Phoca fasciata*
PH	Ringed seal	*Phoca hispida*
PL	Spotted seal; largha seal	*Phoca largha*
PV	Harbor seal	*Phoca vitulina*
UO	Unidentified otariid	NE[2]
UP	Unidentified pinniped	NE
US	Unidentified phocid	NE
ZC	California sea lion	*Zalophus californianus californianus*
	Cetaceans	
BA	Minke whale	*Balaenoptera acutorostrata*
BB	Sei whale	*Balaenoptera borealis*
BE	North Pacific giant bottlenose whale	*Berardius bairdii*
BG	Black right whale	*Balaena glacialis*
BL	Blue whale	*Balaenoptera musculus*
BM	Bowhead whale	*Balaena mysticetus*
BP	Fin whale	*Balaenoptera physalus*
BX	Bryde's whale	*Balaenoptera edeni*
DD	Saddleback, common dolphin	*Delphinus delphis*
DL	Belukha; beluga	*Delphinapterus leucas*
ER	Gray whale	*Eschrichtius robustus*
FA	Pygmy killer whale	*Feresa attenuata*
GG	Whiteheaded grampus; gray grampus	*Grampus griseus*
GM	Shortfin pilot whale	*Globicephala macrorhynchus*
LB	Northern right whale dolphin	*Lissodelphis borealis*

Table 1.--Continued.

Code	Common name	Scientific name
LH	Shortsnouted whitebelly dolphin	*Lagenodelphis hosei*
LO	Pacific white-sided dolphin	*Lagenorhynchus obliquidens*
MM	Narwhal	*Monodon monoceros*
MN	Humpback whale	*Megaptera novaeangliae*
MS	Bering Sea beaked whale	*Mesoplodon stejnegeri*
OO	Killer whale, Orca	*Orcinus orca*
PB	Dall's porpoise	*Phocoenoides dalli:* black type
PC	False killer whale	*Pseudorca crassidens*
PD	Dall's porpoise	*Phocoenoides dalli: dalli* type
PM	Sperm whale	*Physeter macrocephalus*
PP	Harbor porpoise	*Phocoena phocoena*
PT	Dall's porpoise	*Phocoenoides dalli: truei* type
PX	Dall's porpoise	*Phocoenoides dalli:* type unknown
SA	Spotted dolphin (Central Pacific)	*Stenella attenuata*
SB	Rough toothed dolphin	*Steno bredanensis*
SC	Striped dolphin	*Stenella coeruleoalba*
SG	Spotted dolphin (Eastern Pacific)	*Stenella attenuata graffmani*
SL	Spinner dolphin	*Stenella longirostris*
TT	Bottlenose dolphin	*Tursiops truncatus*
UD	Unidentified dolphin/porpoise	NE
UW	Unidentified whale	NE
UX	Unidentified small whale	NE
UZ	Unidentified large whale	NE
ZX	Goosebeak whale	*Ziphius cavirostris*
	Other	
EL	Sea otter	*Enhydra lutris*
UM	Polar bear	*Ursus maritimus*

[1]Rice, Dale W. 1977. A list of the marine mammals of the world. U.S. Dep. Commer., NOAA Tech. Rep. NMFS SSRF-711. 13 p.

[2]No equivalent.

Table 2.--Platforms of Opportunity Program confidence intervals.

Code	Description
0	No error
1	plus or minus 1 animal
2	" " " 2 to 3 animals
3	" " " 4 to 6 "
4	" " " 7 to 12 "
5	" " " 13 to 35 "
6	" " " 36 to 75 "
7	" " " 76 to 100 "
8	" " " 101 to 1000 "
9	represents a minimal estimate of number of animals seen (e.g., at least 10 animals)

Table 3.--Types of behavior and corresponding codes used in the Platforms of Opportunity Program format.

0-30 In water

01 - No specific behavior noted
02 - Sleeping
03 - Courtship or breeding behavior
04 - Feeding
05 - Mother with young
06 - Aggressive
07 - Nonspecific contact/play
08 - Bow riding
09 - Porpoising
10 - Following vessel (e.g., sea lions following a fishing vessel)
11 - Attracted by fish nets
12 - Associated with cetaceans
13 - Associated with pinnipeds
14 - Associated with birds
15 - Associated with cetaceans and birds
16 - Associated with pinnipeds and birds
17 - Associated with pinnipeds and cetaceans
18 - Associated with pinnipeds, cetaceans, and birds
19 - Associated with kelp
20 - Associated with shrimp, euphausids, etc.
21 - Associated with school of baitfish (length under 18 inches)
22 - Associated with larger fish (length over 18 inches)
23 - Associated with concentrations of squid
24 - Associated with vessel and cetaceans
25 - Associated with vessel and pinnipeds
26 - Synchronous diving
27 - Dead animal
28 - Breaching
29 - Avoidance
30 - Lob-tailing

Table 3.--Continued.

31-60 On land
31 - No specific behavior noted
32 - Sleeping
33 - Breeding and pupping rookery
34 - Feeding
35 - Mother with young
36 - Mother with young nursing
37 - Aggressive
38 - Nonspecific contact/play
39 - Thermoregulatory
40 - Dead animals
41-60 - Unassigned
61-80 On ice
61 - No specific behavior noted
62 - Sleeping
63 - Breeding and pupping rookery
64 - Feeding
65 - Mother with young nursing
66 - Mother with young
67 - Aggressive
68 - Nonspecific contact/play
69 - Dead animal
70-80 - Unassigned

Table 3.--Continued.

81-99 Miscellaneous
81 - Hauled on floating debris other than ice
82 - Jug handle
83 - Slapping pectoral flippers
84-89 - Unassigned
90 - Spy-hopping
91 - Rooster-tailing
92 - Slow rolling
93 - Riding stern wake
94 - Milling / Surface splash
95 - Approach vessel > veer away
96 - Slow roll > rooster-tail > slow roll
97 - Riding wake amidships (lateral wakes)
98-99 - Unassigned

Additional notes on behavior can be made in the comments field.

Table 4.--Sea conditions (Beaufort Scale).

Wind force (knots)	Description	Sea conditions	Beaufort scale	Wave height (feet)
< 1	Calm	Sea smooth and mirror-like	0	-
1-3	Light air	Scalelike ripples without foam crests	1	-
4-6	Light breeze	Small, short wavelets; crests have a glassy appearance and do not break.	2	2
7-10	Gentle breeze	Large wavelets; some crests begin to break foam of glassy appearance. Occasional white foam crests.	3	2
11-16	Moderate breeze	Small waves, becoming longer; fairly frequent white foam crests.	4	4
17-21	Fresh breeze	Moderate waves, taking a more pronounced long form; many white foam crests; there may be some spray.	5	6
22-27	Strong breeze	Large waves begin to form; white foam crests are more extensive everywhere; there may be some spray.	6	10
28-33	Near gale	Sea heaps up and white foam from breaking waves begins to be blown in streaks along the direction of the wind; spindrift begins.	7	14

Table 4.--Continued.

Wind force (knots)	Description	Sea conditions	Beaufort scale	Wave height (feet)
34-40	Gale	Moderately high waves of greater length; edges of crests break into spindrift; foam is blown in well-marked streaks along the direction of the wind.	8	18
41-47	Strong gale	High waves; dense streaks of foam along the direction of the wind; crests of waves begin to topple, tumble, and roll over; spray may reduce visibility.	9	23
48-55	Storm	Very high waves with long overhanging crests. The resulting foam in great patches is blown in dense white streaks along the direction of the wind. On the whole, the surface of the sea is white in appearance. The tumbling of the sea becomes heavy and shocklike. Visibility is reduced.	10	29
56-63	Violent storm	Exceptionally high waves that may obscure small and medium-sized ships. The sea is completely covered with long white patches of foam lying along the direction of the wind. Everywhere the edges of the wave crests are blown into froth. Visibility reduced.	11	37

Table 4.--Continued.

Wind force (knots)	Description	Sea conditions	Beaufort scale	Wave height (feet)
64-71	Hurricane	The air is filled with foam and spray. Sea completely white with driving spray; visibility very much reduced.	12	45

Table 5.--Explanation of surface visibility codes used in the Platforms of Opportunity Program format.

Code	Explanation
1	Excellent - Surface of water calm, a high overcast solid enough to prevent sun glare. Marine mammals will appear black against a uniform gray background.
2	Very Good - May be a light ripple on the surface or slightly uneven lighting but still relatively easy to distinguish animals at a distance.
3	Good - May be light chop, some sun glare or dark shadows in part of the survey track. Animals up close (400 m or less) can still be detected and fairly readily identified.
4	Fair - Choppy waves with some slight whitecapping, sun glare or dark shadows in 50% or less of the survey track. Animals much farther away than 400 meters are likely to be missed.
5	Poor - Wind in excess of 15 knots, waves over 2 feet with whitecaps, sun glare may occur in over 50% of the survey track. Animals may be missed unless within 100 meters of the survey trackline. Identification difficult except with the larger species.
6	Unacceptable - Wind in excess of 25 knots, waves over 3 feet with pronounced whitecapping. Sun glare may or may not be present. Detection of any marine mammal unlikely unless the observer is looking directly at the place where it surfaces. Identification very difficult due to improbability of seeing animal more than once.

Table 6.--Fahrenheit to Celsius conversion.

Fahrenheit	Celsius
90	32.2
88	31.1
86	30.0
84	28.0
82	27.8
80	26.7
78	25.6
76	24.4
74	23.3
72	22.2
70	21.1
68	20.0
66	18.9
64	17.8
62	16.7
60	15.6
58	14.4
56	13.3
54	12.2
52	11.1
50	10.0
48	8.9
46	7.8
44	6.7
42	5.6
40	4.4
38	3.3
36	2.2
34	1.1
32	0.0
30	-1.1
28	-2.2
26	-3.3

Table 7.--Codes used in the Platforms of Opportunity Program format to designate the type of platform from which observations were made.

Code	Platform Type
1	Surface vessel
2	Aircraft
3	Ice station
4	Shore station

Table 8.--Source codes used in the Platforms of Opportunity Program format to designate specific aircraft, vessels, or organizations that contribute sighting data.

Code	Vessel name
Codes 001 thru 049 are reserved for NOAA vessels.	
001-	Oceanographer
002-	Discoverer
003-	Surveyor
004-	Fairweather
005-	Rainier
006-	Miller Freeman
007-	McArthur
008-	Davidson
009-	David Starr Jordan
010-	Oregon
011-	Cobb
012-	Kelez
013-	Pribilof
014-	Townsend Cromwell
015-	Chapman
016-	Researcher
017-	Mt. Mitchell
018-	Murre II
019-050	Unassigned
Codes 051 thru 070 are reserved for U.S. Forest Service data from Alaska State Ferries.	
051-	MV E.L. Bartlett
052-	MV Tustemena
053-	MV Wickersham
054-	MV Matanuska
055-	MV Taku
056-	MV Malaspina
057-	MV Columbia
058-070	Unassigned

Table 8.--Continued.

Code	Vessel name	Code	Vessel name

Codes 071 thru 300 are reserved for miscellaneous surface vessels.

071-	RV Alpha Helix	201-	New St. Joseph
072-	RV Resolution	202-	Mark I
073-	RV Acona	203-	Discovery (Sam Guill)
074-	RV Thomas G. Thompson	204-	Trinity
075-	RV Tordenskjold	205-	Tacoma
076-	RV Moana Wave	206-	Harmony
077-	Tonquin	207-	Morningstar
078-	Montegue	208-	Lynn Ann
079-	Professor Siedlicke	209-	GB Reed
080-	S. P. Lee	210-	Nordic Prince
081-	Commander	211-	Aleutian Tern
082-	Sea Hawk	212-	Surfbird
083-	Western Viking	213-	Lindblad Explorer
084-	U.S. Dominator	214-	Glacier Queen
085-	Imperial Adgo	215-	Bartlett
086-	Ungaluk	216-	Shelby D
087-	Half Moon Bay	217-	Yankee Clipper
088-	Pacific Queen	218-	Aikane
089-	Pressure Ridge	219-	Orient
090-	Ocean Harvester	220-	Carter
091-	Norpac I	221-	Diakan
092-	S/S Mariner (SEALAND)	222-	Lindy
093-	S/S Philadelphia (SEALAND)	223-	St. Michael
094-200	Unassigned	224-	Yaquina
		225-	Windward
		226-	Pat San Marie
		227-	China Bear
		228-	Anna Marie
		229-	Susetta
		230-	Flying Cloud
		231-300	Unassigned

Table 8.--Continued.

Code	Vessel name	Code	Vessel name
Codes 301 thru 400 are reserved for U.S. Coast Guard Vessels.			
301-	USCGC Polar Star	316-	USCGC Campbell
302-	USCGC Confidence	317-	USCGC Yocona
303-	USCGC Boutwell	318-	USCGC Jarvis
304-	USCGC Storis	319-	USCGC Burton Island
305-	USCGC Glacier	320-	USCGC Morgenthau
306-	USCGC Winona	321-	USCGC Sherman
307-	USCGC Iris	322-	USCGC Comanche
308-	USCGC Minnetonka	323-	USCGC Acushnet
309-	USCGC Venturous	324-	USCGC Munro
310-	USCGC Ironwood	325-	USCGC Polar Sea
311-	USCGC Midgett	326-	USCGC Citrus
312-	USCGC Rush	327-	USCGC Fire Bush
313-	USCGC Modoc	328-	USCGC Westwind
314-	USCGC Mellon	329-400	Unassigned
315-	USCGC Resolute		
Codes 401 thru 499 are reserved for fishing vessels of various fishing organizations.			
401-	Maranatha	404-498	Unassigned
402-	Ole B.	499-	Unidentified troller
403-	Jolene		
Codes 500 thru 550 are reserved for Japanese vessels.			
500-	Misc. motherships	508-	Hokushin Maru
501-	Oshoro Maru	509-	Iwaki Maru
502-	Hokusei Maru	510-	Kumamoto Maru
503-	Hokuho Maru	511-	Unassigned
504-	Hoyo Maru No. 67	512-	Unassigned
505-	Hokko Maru	513-	Hoyo Maru No. 81
506-	Shotoku Maru No. 35	514-	Misc. catcherboats
507-	Riasu Maru No. 2	515-	Hoyo Maru No. 12

Table 8.--Continued.

Code	Organization

Codes 551 - 949 are presently unreserved.

Codes 950 thru 999 have been reserved for data submitted by various persons or organizations where the vessel is unidentified.

950-	Mr. Rodney Judy
951-986	Unassigned
987-	Alaska Dep. of Fish & Game
988-	Washington Dep. of Fish & Game
989-	Mr. Bill Lawton
990-	U.S. Forest Service
991-	NOAA, NMFS Enforcement Division
992-	U.S. Coast Guard, vessel unidentified
993-	Mr. Terry Wahl
994-	NMFS, Foreign Fisheries Observer Program
995-	International Pacific Halibut Commission
996-	National Marine Mammal Laboratory, observer unidentified
997-	U.S. Fish & Wildlife Service
998-	National Marine Mammal Laboratory, pelagic sealing
999-	Used to identify data that is received from miscellaneous sources on a one-time only basis. Cases with this source ID are more fully documented in the raw data files under miscellaneous.

The names of individuals within the above organizations who made observations will be included in the comments field where possible.

Instructions for Filling out Effort Forms

The Marine Mammal Sighting Effort Form (Fig. 3) contains much of the same information as the Marine Mammal Sighting Form with the exception of items 5-9 (boxes 33-52), and the addition of the transit flag (box 64). This is our method of recording observation effort. At the beginning of a watch period, fill in your name, the vessel name, and the date. At the beginning of each sighting transit (defined as a period of sighting effort during which vessel speed does not change by more than 3 knots, vessel direction does not change by more than 5º, and environmental conditions do not change sufficiently to effect a change in visibility code), fill in the time, position, and environmental conditions, and place a "1" in box 64. When you end a transit, fill out another line with the new time, position, etc., and place a "2" in box 64.

As marine mammals are sighted, fill out the sighting form but do not leave your observation post to get a position. Positions for all marine mammals seen while on watch should be obtained by dead reckoning after the sighting effort is completed, unless you have access to the navigation equipment without leaving your post. For all positions obtained by dead reckoning, record to nearest minute. For all positions obtained by satellite navigation or Loran systems, record to nearest tenth of a minute.

Transits should be at least 20 minutes long to have value for population estimation purposes. If a continuous watch is maintained for several hours, log positions (i.e., end one watch and begin a new watch) every hour. This provides hourly weather information and makes the dead reckoned positions more accurate. Note that when a watch ends and a new one begins immediately, data for the end of the leg (transit flag 2) will be the same as for the beginning of the next leg (transit flag 1).

Do not maintain effort forms if your vessel is drifting or making very slow headway (e.g., at oceanographic or fishing stations). Log mammals seen during these periods on the sighting forms and make note of the vessel's activity in the comments section. Do not maintain effort forms if you are not actively looking for mammals. However, if you are actively looking for mammals and do not see any, fill out the effort form. It is important to know where animals are absent as well as where they are found.

MARINE MAMMAL SIGHTING EFFORT FORM

1	2	3	4	5	6
1	8	6	0	7	0

* Record I.D.

7	8	9	10	11	12
8	6	0	3	1	4

Year Month Day

Name Lew Consiglieri

Vessel Miller Freeman

TIME					LATITUDE					N/S	LONGITUDE						E/W	SEA STATE	WEATHER	VISIBILITY	*	Vis. code	±	Sea surface	Temp. (° C)	*	Platform code			±	Time zone	Transit flag	Water depth (meters)				
13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30				53	54	55	56	57	58	59	60	61	62	63	64	77	78	79	80
0	7	0	0		5	7	5	0	2	N	1	5	4	1	0	3	W	Beauf 1	Ptly Cloudy	10 Nm	3	+	0	4	1	0	0	6	+	1	0	1				
0	8	0	0		5	7	5	2	3	N	1	5	4	1	2	5	W	1	Clearing slightly	12 nm	3	+	0	4	1	0	0	6	+	1	0	2				
0	8	0	1		5	7	5	2	3	N	1	5	4	1	2	5	W	"	" "	" "	3	+	0	4	1	0	0	6	+	1	0	1				
0	9	0	0		5	7	5	3	0	N	1	5	4	1	3	0	W	Beauf 1	Ptly Cloudy	15 nm	2	+	0	4	1	0	0	6	+	1	0	2				
																		OFF watch,	oceanographic	station															
1	0	0	0		5	7	5	3	0	N	1	5	4	1	3	1	W	B-1	Ptly Cloudy	15 nm	2	+	0	5	1	0	0	6	+	1	0	1				
1	1	3	0		5	7	5	5	1	N	1	5	4	1	4	9	W	B-1	Ptly Cloudy	15 nm	2	+	0	5	1	0	0	6	+	1	0	2				
																			-LUNCH-																	
																		12:30 -	FOG moved in during																	
																		Lunch	-Visibility inadequate																	
																		For	sightings surveys.																	
13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30				53	54	55	56	57	58	59	60	61	62	63	64	77	78	79	80

Figure 3.--Marine mammal sighting effort form.

QUALITY CONTROL

After all the marine mammal sighting data are received from each source for a particular year, the POP data manager begins the rigorous quality control procedures.

The steps involved are as follows:

100% Check: After the data forms have been received, they are individually reviewed to check for missing codes, validity of identifications and codes, and any other obvious anomalies. At this time the POP manager assigns the cruise a Record ID (see the following section for a description of the Record ID).

Data entry: The forms are then sent out to a commercial data entry facility for transcription to magnetic tape. When the tape comes back from the service, the POP manager is provided with a printout of the data and the number of the tape that it is on. The data are then transferred to disk on the main computer.

10% Check: To pick up gross errors, every tenth entry of the' transcribed data is checked against the original forms. If the data appear clean at this point, the quality control proceeds to the next step. If the data appear to be very poorly transcribed, the job is resubmitted to the data entry facility.

Sort/RID: Sightings and effort data must be sorted together by date and time to obtain the proper chronology for the merged data. After the data are sorted, Record IDs (RID) are inserted at the beginning of each cruise, and an *EOR[1] is inserted at the end of each cruise. The following section describes the Record ID format.

QCPOP: The data are now ready for the quality control program (QCPOP). This program is described fully in the section on computer program checks.

Mapping: This final stage of the quality control process is described in the section on mapping.

After all of the corrections have been made, the files are given to the NMML data manager to be added to the database.

[1] End Of Record flag.

Instructions for Filling out the Record ID

The following explains how to complete the Record ID. The Record ID forms a header for each record (cruise or data set) and is used only once at the beginning of each record.

Columns	Variable name	Definition and remarks
1-4	RU	Columns 1-2 must have the letters RU. This is an artifact from the early years of the program, when it was originally used to identify the OCSEAP research unit number (i.e., RU##). Early data sets still have the RU number in the header card.
5		Blank
6-11	RID	For each record, you must create a unique descriptor that will be used to identify all of the entries for that record. The first number of the descriptor is used to sequence records which may have otherwise identical Record ID's. The next five numbers are the Julian date (Tables 9 & 10) of the first day of sightings. For example, for the Record ID 175168, "1" indicates that this was the first cruise received by POP which provided marine mammal sighting data as early as the "168"th Julian day in 1975. Up to nine unique RID's can be assigned for a single Julian day.
12		Blank
13	N	In the early years this field was f-lagged with an "N" if data were not going to be transmitted to the Environmental Data Service, and an "E" if they were. This field is no longer used.
14-16		
17-19	BEGMO	Enter a three-character abbreviation for the month specified on the first sighting entry of the record. Use the following abbreviations for BEGMO: JAN, FEB, MAR, APR, MAY, JUN, JUL, AUG, SEP, OCT, NOV, DEC.
20		Blank
21-22	BEGDAY	Enter the day specified on the first sighting entry of the record.

23-24		Blank
25-27	ENDMO	Enter a three-character abbreviation for the month specified on the last sighting entry of the record. See BEGMO for abbreviations of months.
28		Blank
29-30	ENDDAY	Enter the day specified on the last sighting entry of the record.
31-33		Blank
34-37	YEAR	Enter the year in which the record began. Although records seldom contain information collected over a period exceeding a few months, occasionally cruises may extend, for example, from December of one year to February of the next. In these cases, enter the year in which the records began.
38		Blank
39-80		Using standard POP abbreviations (Table ll), enter alphanumeric text which describes the source of the data and the area from which the data were collected. Beginning in column 39, enter the organization (e.g., NOAA) followed by a space and then the platform name from which the data were collected (e.g., SURVEYOR). Follow the platform name with a slash (/) and enter the general area from which data was collected (e.g. GOA). For example, NOAA SURVEYOR/GOA translates as data collected aboard the vessel SURVEYOR by NOAA in the Gulf of Alaska. In some cases you will find that these guidelines cannot accommodate your entry. Use your own judgment in best describing the source and location of collection.

Table 9.--Julian date calendar, non-leap years.

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Day
1	001	032	060	091	121	152	182	213	244	274	305	335	1
2	002	033	061	092	122	153	183	214	245	275	306	336	2
3	003	034	062	093	123	154	184	215	246	276	307	337	3
4	004	035	063	094	124	155	185	216	247	277	308	338	4
5	005	036	064	095	125	156	186	217	248	278	309	339	5
6	006	037	065	096	126	157	187	218	249	279	310	340	6
7	007	038	066	097	127	158	188	219	250	280	311	341	7
8	008	039	067	098	128	159	189	220	251	281	312	342	8
9	009	040	068	099	129	160	190	221	252	282	313	343	9
10	010	041	069	100	130	161	191	222	253	283	314	344	10
11	011	042	070	101	131	162	192	223	254	284	315	345	11
12	012	043	071	102	132	163	193	224	255	285	316	346	12
13	013	044	072	103	133	164	194	225	256	286	317	347	13
14	014	045	073	104	134	165	195	226	257	287	318	348	14
15	015	046	074	105	135	166	196	227	258	288	319	349	15
16	016	047	075	106	136	167	197	228	259	289	320	350	16
17	017	048	076	107	137	168	198	229	260	290	321	351	17
18	018	049	077	108	138	169	199	230	261	291	322	352	18
19	019	050	078	109	139	170	200	231	262	292	323	353	19
20	020	051	079	110	140	171	201	232	263	293	324	354	20
21	021	052	080	111	141	172	202	233	264	294	325	355	21
22	022	053	081	112	142	173	203	234	265	295	326	356	22
23	023	054	082	113	143	174	204	235	266	296	327	357	23
24	024	055	083	114	144	175	205	236	267	297	328	358	24
25	025	056	084	115	145	176	206	237	268	298	329	359	25
26	026	057	085	116	146	177	207	238	269	299	330	360	26
27	027	058	086	117	147	178	208	239	270	300	331	361	27
28	028	059	087	118	148	179	209	240	271	301	332	362	28
29	029		088	119	149	180	210	241	272	302	333	363	29
30	030		089	120	150	181	211	242	273	303	334	364	30
31	031		090		151		212	243		304		365	31

Table l0.--Julian date calendar, leap years (1980, 1984, 1988, etc.).

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Day
1	001	032	061	092	122	153	183	214	245	275	306	336	1
2	002	033	062	093	123	154	184	215	246	276	307	337	2
3	003	034	063	094	124	155	185	216	247	277	308	338	3
4	004	035	064	095	125	156	186	217	248	278	309	339	4
5	005	036	065	096	126	157	187	218	249	279	310	340	5
6	006	037	066	097	127	158	188	219	250	280	311	341	6
7	007	038	067	098	128	159	189	220	251	281	312	342	7
8	008	039	068	099	129	160	190	221	252	282	313	343	8
9	009	040	069	100	130	161	191	222	253	283	314	344	9
10	010	041	070	101	131	162	192	223	254	284	315	345	10
11	011	042	071	102	132	163	193	224	255	285	316	346	11
12	012	043	072	103	133	164	194	225	256	286	317	347	12
13	013	044	073	104	134	165	195	226	257	287	318	348	13
14	014	045	074	105	135	166	196	227	258	288	319	349	14
15	015	046	075	106	136	167	197	228	259	289	320	350	15
16	016	047	076	107	137	168	198	229	260	290	321	351	16
17	017	048	077	108	138	169	199	230	261	291	322	352	17
18	018	049	078	109	139	170	200	231	262	292	323	353	18
19	019	050	079	110	140	171	201	232	263	293	324	354	19
20	020	051	080	111	141	172	202	233	264	294	325	355	20
21	021	052	081	112	142	173	203	234	265	295	326	356	21
22	022	053	082	113	143	174	204	235	266	296	327	357	22
23	023	054	083	114	144	175	205	236	267	297	328	358	23
24	024	055	084	115	145	176	206	237	268	298	329	359	24
25	025	056	085	116	146	177	207	238	269	299	330	360	25
26	026	057	086	117	147	178	208	239	270	300	331	361	26
27	027	058	087	118	148	179	209	240	271	301	332	362	27
28	028	059	088	119	149	180	210	241	272	302	333	363	28
29	029	060	089	120	150	181	211	242	273	303	334	364	29
30	030		090	121	151	182	212	243	274	304	335	365	30
31	031		091		152		213	244		305		366	31

Table II.--List of standard abbreviations used in Platforms of Opportunity Program format Record ID card.

Abbreviation	Description
AERIAL	Aerial survey data
AK	Alaska
ALEUTIANS	Indicates waters near to the Aleutian Islands
BERING	Bering Sea
CANADA	Indicates waters near western Canadian coastline
CHARTERS	Charter boats, both sport fishing and others
CHUKCHI	Chukchi Sea
E	East
EQ	Equatorial
FFOP	Foreign Fisheries Observer Program. Identifies data collected by U.S. observers aboard foreign fishing vessels.
FVOP	Foreign Vessel Observer Program. Older name for FFOP.
GOA	Gulf of Alaska, typically away from the coast or northern Gulf of Alaska
GOJ	Government of Japan
LCI	Lower Cook Inlet
MISCELLANEOUS DATA	Enter in lieu of source and platform on file header to indicate that data as received cannot be ascribed to source or platform.
MMD	Marine Mammal Division. Older name for NMML.

Table 11.--Continued.

Abbreviation	Description
MR.	Mister. Used when identifying contributor of data as a male person rather than as an organization.
MS.	MS. Used when identifying contributor of data as a female person rather than as an organization.
N, NE, NW	North, northeast, northwest
NMML	National Marine Mammal Laboratory. Used to identify cruises on which an NMML observer was aboard.
POP	Platforms of Opportunity Program
PWS	Prince William Sound
RACE	Resource Assessment and Conservation Engineering Division
SS	Shelikof Strait
S, SE, SW	South, southeast, southwest
UNID	Unidentified. Typically used on Record ID card to describe unidentified persons or vessels which are a member of some identifiable group (e.g., UNID TROLLER = source of data was a member of the Alaska Trollers' Association which, as an organization, contributes data to POP). Records thus categorized should not contain any transit information to preclude the possibility of pairing the beginning and the end transit cases for different vessels.
UNK	Unknown. Typically used on Record ID card to describe platforms (vessels) or species that cannot be identified.
USCG	United States Coast Guard

Table II.--Continued.

Abbreviation	Description
W	West
W COAST	Pacific Ocean waters off of Washington, Oregon, California, and British Columbia

Computer Program Checks

During this stage of quality control, a comprehensive series of checks is made on the raw data file by a computer quality control program (QCPOP). There are two basic categories of checks: those which test conformity of data to formal specifications, and those which test relationships between variables for logical consistency and validity. When a test fails, the program flags the text to allow POP personnel to reevaluate the information and determine the validity of data.

The QCPOP references variables by field number for test categories I through V. Table 12 provides field numbers associated with each variable along with brief variable descriptions.

Tests Performed:

Category I - Class (Blanks) Fields 7 and 16 are checked for blanks. Test failure occurs when characters occur in these fields.

Category II - Class (Integer) - Fields 1-6, 8-10, 12-14, 19-21, and 23-32 are checked. Test failure occurs when non-integer characters are encountered, or when integer values contain imbedded blanks or when integer values are not right justified.

Category III - Interval (Integer) - The 24 fields listed under Category II are checked for minimum and maximum allowable integer values (Table 13). Test failure occurs when range boundaries are exceeded.

Category IV - Codes (Alphanumeric) - Fields 11, 15, 17, 18, and 22 are tested for the legality of characters. Test failure occurs when undefined codes are encountered (Table 14).

Category V - Existence - Twenty-four tests involving two or more fields are made on 28 variables. Table 15 summarizes these tests. A test failure occurs when prescribed conditions of test are violated.

Category VI - Relational - Twenty relational checks are made between variables. Table 16 lists these checks along with a brief description of the variables involved. Listed below are more complete descriptions for each test number:

1. Number of days in month incorrect.

1. Number of days in month incorrect.

A test is made to insure that the variable Day has a value less than or equal to the number of days in that month listed on the same entry. See also test 8.

2. Number of animals sighted for species too high.

Based on our knowledge of natural history and stock sizes of some marine mammals, we can estimate the maximum number of animals one might expect to see for any given species. For example, a sighting of 500 sea lions is not unusual, but a sighting of 500 blue whales would clearly be questionable. Test failure occurs when the number of animals exceeds specified values (Table 17).

3. Group size' too large.

Based upon our knowledge of natural history of some marine mammals, we can predict group sizes (i.e., a number of animals in close association with each other). Table 17 lists these maximum allowable values before test failure occurs.

4. Behavior code incompatible with species.

As each species is encountered by QCPOP, a check is made to determine whether the indicated behavior is possible. For example, gray whales do not haul out on ice. If such a combination of species and behavior code were detected, test failure would, result. Table 18 lists incompatible behavior codes for each species.

5. Confidence interval out of range.

The lower range boundary of the confidence interval cannot be less than zero, and the upper range boundary cannot exceed half the total. Test failure occurs when range boundaries are exceeded.

6. Group size exceeded total animals seen.

Test failure occurs when the variable Group Size exceeds the variable Number.

[1] Group size is no longer being recorded.

7. Initial sighting distance incompatible with behavior code.

This relational check compares behavior codes with initial sighting distance (i.e., distance from observer to animal when the animal was first seen). For example, behavior code 02 represents an animal which was sleeping, perhaps a sea lion sleeping on rocks, and the initial sighting distance for behavior code 02 exceeds 1000 m; the test would fail and the case would be rechecked with raw data sheets for verification or rejection of the data. See Table 19 for range boundaries of initial sighting distances as they relate to behavior code.

8. Number of days in February on a leap year incorrect.

This test is made separately from test 1 for two reasons: treating this check separately makes the program more efficient and the test involves three variables, whereas test 1 involves two variables. Test failure occurs when Day exceeds 29 during February on leap years.

9. Area in which species was sighted is not normal for that species or sighting occurred outside normal bounds of study area.

Based on knowledge of gross geographic distribution of each species and on knowledge of where most ships sail that contribute data to POP, minimum and maximum latitudes and longitudes have been defined where species are likely to be sighted. If these boundaries, which vary by species, are exceeded, test failure occurs. As an example, it' beluga whales, which live in Alaskan waters, were sighted off the coast of Washington: QCPOP would flag the sighting (see Table 17).

10. Time out of sequence.

Time must be in chronological order throughout each record. If time is not in chronological order, test failure occurs.

11. Distance of transit exceeded 300 nautical miles.

Occasionally, data are received which documents ship time and position at intervals during which some watch effort is expended. This information can be treated as transit data, whereby watch effort can be evaluated with ship position to obtain some index to animal density. We have arbitrarily allowed transit lengths to be less than or equal to 300 nautical miles in length (equivalent to 20 knots for 15 hours) before test failure occurs.

12. Speed of ship exceeded 20 knots.

Ship speed is calculated, based upon the beginning and ending of transits. When ship speed exceeds 20 knots, the end of transit entry is flagged.

13. Number of continuous hours of observation exceeded 15.

Any transit that encompasses a time period exceeding 15 hours in duration is flagged.

14. Transit occurred during darkness.

The beginning and ending time of each transit is checked against a table of average sunrise and sunset times by latitude and time of year to verify that transits occurred during daylight hours. Sightings at night while on transits indicate possible errors in data. Note that some nighttime sightings have been received from commercial fishermen who have observed sea lions within range of flood lights during fishing operations. These sightings, however, were made during nontransit type operations.

15. Species sighted is rare.

Test failure occurs when any species which is rarely seen (Table 20) occurs on a sighting entry.

16. Transit beginning and ending flags not in proper order.

The variable Flag can receive the values of “1” for the beginning of a transit, or “2” for the end of a transit. The value of “1” must always be followed at some later time by a value of “2.” A “1” cannot be followed by a “1” and a “2” cannot be followed by a “2.” Test failure occurs whenever the above logic is violated.

17. Record ID (RID) on a data entry incorrect or inconsistent with starting date of record.

The variable RID (see the section on Instructions for Filling out the Record ID card) is calculated from the date provided on the first data card of the Record. This value not only should agree with the starting date of the cruise, but also should be the same on every entry of the record.

18. Time zone value changed by more than “2” on adjacent data entries.

Vessels very rarely change clock settings by more than two time zones in any given day. If such a change occurs it is flagged by QCPOP for inspection.

19. Water temperature has exceeded allowable value for latitude of data entry.

Surface water temperature varies roughly by latitude. Upper limits for expected temperatures for several ranges of latitudes have been assigned for this test. If the temperature on a data entry exceeds that allowed for the latitude, the entry is flagged.

20. Beginning and ending times of transit are the same or the positions are the same.

A transit must span a period of time or length of track line. If it does not, the second entry of the transit pair (Flag = 2) is flagged.

Table 12.--List of variable names for data entries with descriptions as used in Platforms of Opportunity Program format.

Variable name	Field number	Starting column	Field length	Field type[1]	Variable description
RID	1	(1)	6	i	Record identifier
YR	2	(7)	2	i	Year
MO	3	(9)	2	i	Month
DAY	4	(11)	2	i	Day
HR	5	(13)	2	i	Hour
MN	6	(15)	2	i	Minute
	7	(17)	1	-	Blank
LD	8	(18)	2	i	Latitude in degrees
LM	9	(20)	2	i	Latitude in minutes
LS	10	(22)	1	i	Latitude in tenths of minutes
NS	11	(23)	1	a	Latitude hemisphere
LLD	12	(24)	3	i	Longitude in degrees
LLM	13	(27)	2	i	Longitude in minutes
LLS	14	(29)	1	i	Longitude in tenths of minutes
EW	15	(30)	1	a	Longitude hemisphere
	16	(31)	2	-	Blank
SPE	17	(33)	2	a	Species

Table 12.--Continued.

Variable name	Field number	Starting column	Field length	Field type[1]	Variable description
REL	18	(35)	1	a	Reliability of species identification
CONF	19	(36)	1	i	Confidence interval
NUM	20	(37)	4	i	Number of animals sighted
GROUP	21	(41)	2	i	Group size[2]
IDIR	22	(43)	2	a	Direction of animals' movement[2]
BEHAVE	23	(45)	2	i	Behavior of animals
ANGLE	24	(47)	3	i	Relative angle (360 degree circle with bow at 000) that animal was initially sighted at
IDIST	25	(50)	3	i	Initial sighting distance to animals in tens of meters
VISI	26	(53)	1	i	Visibility
WATER	27	(54)	3	i	Surface water temperature (°C)
PTYPE	28	(57)	1	i	Platform type
SID	29	(58)	3	i	Source identification
TZ	30	(61)	3	i	Time zone

Table 12.--Continued.

Variable name	Field number	Starting column	Field length	Field type[1]	Variable description
FLAG	31	(64)	1	i	Flag designating beginning or ending of transit
TEXT	32	(65)	15	a	Text or comments

[1](i) = integer; (a) = alphanumeric.

[2]No longer collected.

Table 13.--Integer variables checked by QCPOP with acceptable range of values for each.

Variable name	Field number	Minimum possible value	Maximum possible value	Notes
RID	1	158000	599999	Unlikely to have more than 5 cruises start on same day.
YR	2	58	89	To present
MO	3	1	12	
DAY	4	1	31	Varies by month
HR	5	0	23	Military time (24 hour clock)
MN	6	0	59	
LD	8	26	75	Where most Platforms of Opportunity Program vessels sail
LM	9	0	59	
LS	10	0	9	
LLD	12	110	180	Where most Platforms of Opportunity Program vessels sail
LLM	13	0	59	
LLS	14	0	9	
CONF	19	0	9	
NUM	20	0	9999	
GROUP	21	0	99	
BEHAVE	23	0	98	Not all inclusive values are possible. See Table 3.

Table 13.--Continued.

Variable name	Field number	Minimum possible value	Maximum possible value	Notes
ANGLE	24	0	359	
IDIST	25	0	999	
VIS	26	1	6	
WATER	27	-4	26	
PTYPE	28	1	4	
SID	29	1	999	Not all inclusive values are possible. See Table 8.
TZ	30	-12	12	
FLAG	31	0	2	

Table 14.--Alphanumeric variables and associated possible codes.

Variable name	Field number	Code
NS	11	N, S
EW	15	E, W
SPE	17	See POP format code list for Species codes (Table 1)
REL	18	T, _ (blank)
IDIR	22	N_, S_, _E, _W, NE, NW, SE, SW, __ (blank)

Table 15.--Relational existence checks performed by QCPOP. For each sighting entry, checks are listed in vector form: (a, b,...c) where (a) the field number is treated as the independent variable and (b,...c) are treated as dependent variables. This vector is read: Given (a) exists, (b,...c) must also exist. Vector (a,a) indicates that variable (a) cannot be blank. Checks are applied to each data entry.

Test	Description
(1,1)	Record Identifier (RID) must exist.
(2,2)	Year (YR) must exist.
(3,3)	Month (MO) must exist.
(5,4)	Given Hour (HR), Day (DAY) must exist.
(6,4,5)	Given Minute (MN), Hour (HR) and Day (DAY) must exist.
(8,8)	Latitude in Degrees (LH) must exist.
(10,9)	Given Latitude in tenths of a minute (LS), Latitude in Minutes (LM) must exist.
(11,11)	Latitude Hemisphere (NS) must exist.
(12,12)	Longitude in Degrees (LLH) must exist.
(14,13)	Given Longitude in tenths of a minute (LLM), Longitude in Minutes (LM) must exist.
(15,15)	Longitude Hemisphere (EW) must exist.
(17,20)	Given Species (SPE), Number (NUM) must exist.
(18,17)	Given Reliability (REL), Species (SPE) must exist.
(19,17)	Given Confidence Interval (CONF), Species (SPE) must exist.

Table 15.--Continued.

Test	Description
(21,17)	Given Group Size (GROUP), Species (SPE) must exist.
(22,17)	Given Direction Headed (IDIR), Species (SPE) must exist.
(23,17)	Given Animals Behavior (BEHAVE), Species (SPE) must exist.
(24,17)	Given Angle of Initial Sighting (ANGLE), Species (SPE) must exist.
(25,17)	Given Initial Sighting Distance (IDIST), Species (SPE) must exist.
(28,28)	Platform Type (PTYPE) must exist.
(29,29)	Source Identification (SID) must exist.
(30,30)	Time Zone (TZ) must exist.
(31,4,5,6, 8,9,12,13)	Given Flag (FLAG), Day (DAY), Hour (HR), Minute (MN), Latitude Degrees (LD), Latitude Minutes (LM), Longitude Degrees (LLD), and Longitude Minutes (LLM) must exist.

Table 16.--Relational checks performed by QCPOP. The check numbers [in brackets] refer to QCPOP output diagnostic.

Check number	Field number involved	Description
[1]	2,3	Number of days in month is incorrect.
[2]	17,20	Number of animals sighted for this species is too high.
[3]	17,21	Group size is too large.
[4]	17,23	Behavior code is incompatible with species.
[5]	19,20	Confidence interval indicates a range larger than half the total number of animals seen.
[6]	20,21	Group size has exceeded total number of animals seen.
[7]	23,25	Initial sighting distance is incompatible with behavior code.
[8]	2,3,4	Number of days in February during a leap year is incorrect.
[9]	8,12,17	Area in which species was sighted is not normal for that species, or sighting occurred outside the normal bounds of the study area.
[10]	2,3,4,5,6	Time is out of sequence.
[11]	8,9,10,11,12,13,14,15	Distance of transit exceeded 300 nautical miles.
[12]	2,3,4,5,6,8,9, 10,11,12,13,14,15	Vessel speed during a transit exceeded 20 knots.

Table 16.--Continued.

Check number	Field number involved	Description
[13]	2,3,4,5,6,8,9,11,12,13,15	Number of continuous observation hours exceeded 15.
[14]	2,3,4,5,6,8,11,12,15	Transit occurred during darkness.
[15]	17	Species is rare.
[16]	31	Transit beginning and ending flags are not in the proper order.
[17]	1,2,3,4	Record Identifier on data cards is incorrect or inconsistent with the starting date of the record.
[18]	31	Time Zone changed by two or more on adjacent data entries.
[19]	8,12,27	Water temperature has exceeded the value expected for this latitude.
[20]	2,3,4,5,6,8,9, 10,12,13,14, 15,31	Beginning and ending times of transit are the same, or the positions are the same.

Table 17.--Range of allowable value states for the variables number, group size, latitude and longitude for each species. Values exceeding ranges are flagged by QCPOP for verification by researcher.

	Number of animals		Group size		Latitude[1]		Longitude	
Species code	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Pinnipeds								
CU	1	8000	1	1000	32	62	110W	140E
EB	1	25	1	25	50	75	110W	140E
EJ	1	8000	1	1000	32	65	115W	140E
MA	1	100	1	100	26	60	110W	140E
OR	1	2000	1	2000	55	75	110W	140E
PF	1	100	1	10	50	75	110W	140E
PH	1	25	1	25	55	75	110W	140E
PL	1	100	1	100	26	60	110W	140E
PV	1	1500	1	1500	30	75	115W	140E
UO	1	8000	1	1000	26	65	115W	140E
UP	1	2000	1	2000	26	75	110W	140E
US	1	1500	1	1500	26	75	110W	140E
ZC	1	1000	1	1000	26	51	110W	140E
Cetaceans								
BA	1	10	1	4	26	65	110W	140E
BB	1	50	1	20	26	61	110W	140E
BE	1	15	1	15	32	60	110W	140E
BG	1	10	1	10	26	65	110W	140E
BL	1	10	1	4	26	60	110W	140E
BM	1	6	1	6	55	75	110W	140E
BP	1	50	1	15	26	61	110W	140E
BX	1	50	1	20	26	50	110W	140E
DD	1	2000	1	2000	26	50	110W	140E
DL	1	300	1	50	58	75	110W	140E
ER	1	200	1	200	26	75	110W	140E
FA	1	10	1	10	0	30	100W	140E
GG	1	1000	1	25	26	61	110W	140E
GM	1	500	1	500	26	50	110W	140E

Table 17.--Continued.

Species code	Number of animals		Group size		Latitude[1]		Longitude	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
LB	1	2000	1	2000	26	60	115W	140E
LH	1	2000	1	2000	0	30	110W	140E
LO	1	1000	1	1000	32	62	110W	140E
MM	1	20	1	20	65	75	110W	140E
MN	1	100	1	25	26	61	110W	140E
MS	1	3	1	3	42	65	110W	140E
OO	1	25	1	25	26	75	110W	140E
PB	1	50	1	20	32	65	115W	140E
PC	1	100	1	100	26	50	110W	140E
PD	1	50	1	20	32	65	115W	140E
PM	1	100	1	100	26	60	110W	140E
PP	1	20	1	20	32	65	110W	140E
PT	1	50	1	20	32	65	115W	140E
PX	1	50	1	20	32	65	115W	140E
SA	1	2000	1	2000	0	30	110W	140E
SB	1	2000	1	2000	0	30	100W	140E
SC	1	2000	1	2000	0	30	110W	140E
SG	1	2000	1	2000	0	30	110W	140E
SL	1	2000	1	2000	0	25	110W	140E
TT	1	500	1	500	0	30	110W	140E
UD	1	2000	1	2000	26	75	110W	140E
UW	1	2000	1	2000	26	75	110W	140E
UX	1	2000	1	2000	26	75	110W	140E
UZ	1	200	1	200	26	75	110W	140E
ZX	1	25	1	25	32	65	110W	140E
Other								
EL	1	300	1	150	32	61	115W	140E
UM	1	30	1	5	60	75	110W	140E

[1]Latitudes are all Northern Hemisphere.

Table 18.--List of improbable behavior codes by species. These are flagged by QCPOP for reinspection. Codes listed below are based on current knowledge of natural history and known behavior.

Species code[1]	Improbable or impossible behavior codes[2]
Pinnipeds	
CU	08, 28-30, 41-81, >83
EB	08-11, 28-30, 41-60, 70-80, >82
EJ	08, 09, 28-30, 41-60, 70-80, >82
MA	08, 09, 28-30 >41
OR	08-11, 28-30, 41-60, 70-80, >82
PF	08-11, 28-30, 31-39, 41-60, 70-80, >82
PH	08-11, 28-30, 31-39, 41-60, 70-80, >82
PL	08-11, 24-26, 28-30, 41-60, 70-80, >82
PV	08-11, 24-26, 28-30, 41-80, >82
UO	08, 09, 28-30, 41-60, 70-80, >82
UP	08, 09, 28-30, 41-60, 70-80, >82
US	08, 09, 28-30, 41-60, 70-80, >82
ZC	08, 09, 28-30, 41-80, >83
Cetaceans	
BA	08-11, 28, 30-39, >41
BB	01-07, 28, 30-39, >41
BE	08-11, 24, 25, 31-39, >41
BG	08-11, 31-39, >41
BL	08-11, 31-39, >41
BM	08-11, 31-39, 41-82, >84
BP	08-11, 28, 30-39. >41
BX	08-11, 31-39, >41
DD	11, 28-39, >41
DL	08-11, 24, 25, 31-39, >41
ER	08-11, 31-39, 41-89, >91
FA	10, 11, 28-39, >41
GG	10, 11, 24, 25, 28, 29, 31-39, 41-82, 84-89, 91, 92, >94
GM	08, 11, 31-39, >41
LB	10, 11, 24, 25, 28-39, >41
LH	28-39, >41

Table 18.--Continued.

Species code[1]	Improbable or impossible behavior codes[2]
LO	28-39, >41
MM	08-11, 24, 25, 31-39, >41
MN	08-11, 31-39, 41-82, >84
MS	08-11, 24, 25, 31-39, >41
OO	08-09, 31-39, 41-82, 84-89, 91, >93
PB	09, 28-39, 41-90
PC	31-39, >41
PD	09, 28-39, 41-90
PM	08-11, 24, 25, 29-39, >41
PP	08-11, 24, 25, 28-39, 41-91, >93
PT	09, 28-39, 41-90
PX	09, 28-39, 41-90
SA	28-39, >41
SB	11, 28-39, >41
SC	28-39, >41
SG	28-39, >41
SL	28-39, >41
TT	28-39, >41
UD	31-39, >41
UW	31-39, >41
UX	31-39, >41
UZ	08-11, 31-39, >41
ZX	08-11, 24, 25, 28-39, >41
Other	
EL	08, 09, 28-30, >41
UM	02, 03, 08-11, 19-26, 28-30, 41-60, >70

[1]See Table 12 for species codes definitions.
[2]See Table 13 for behavior code definitions.

Table lg.--Minimum and maximum initial sighting distances (in meters) that can be associated with observed behaviors.

	Initial sighting distance			Initial sighting distance	
Behavior code[1]	Minimum allowable	Maximum allowable	Behavior code[1]	Minimum allowable	Maximum allowable
01	0	9999	31	0	1000
02	0	1000	32	0	80
03	0	1000	33	0	200
04	0	1000	34	0	100
05	0	1000	35	0	200
06	0	1000	36	0	200
07	0	1000	37	0	100
08	0	1000	38	0	150
09	0	1500	39	0	300
10	0	1000	40	0	300
11	0	1000	61	0	300
12	0	1000	62	0	80
13	0	1000	63	0	200
14	0	1000	64	0	100
15	0	1000	65	0	100
16	0	1000	66	0	200
17	0	1000	67	0	150
18	0	1000	68	0	300
19	0	1000	69	0	50
20	0	1000	81	0	1000
21	0	1000	82	0	1000
22	0	1000	90	0	1000
23	0	1000	91	0	1500
24	0	1000	92	0	1000
25	0	1000	93	0	1000
26	0	1000	94	0	1000
27	0	1000	95	0	1000
28	0	1500	96	0	1000
29	0	1000	97	0	1000
30	0	1000			

[1]See Table 3 for behavior code definitions.

Table 20.--List of species which are rarely seen on marine mammal surveys. These values are flagged by the quality control program for verification by the researcher.

Species code	Scientific name	Common name
BE	*Berardius bairdii*	North Pacific giant bottlenose whale
BG	*Balaena glacialis*	Right whale
BL	*Balaenoptera musculus*	Blue whale
FA	*Feresa attenuata*	Pygmy killer whale
MM	*Monodon monoceros*	Narwhal
MS	*Mesoplodon stejnegeri*	Sabertooth whale, Bering Sea beaked whale
ZX	*Ziphius cavirostris*	Goosebeak whale

MAPPING

A computer drawn map (Fig. 4) is made of positions after all data have been completely processed through QCPOP and edited by POP personnel. A visual scan is made for any points occurring on land and effort lines that are obviously too long. Points occurring on land are checked against raw data, and values are either corrected to match the raw data or rejected completely if no discrepancy occurs.

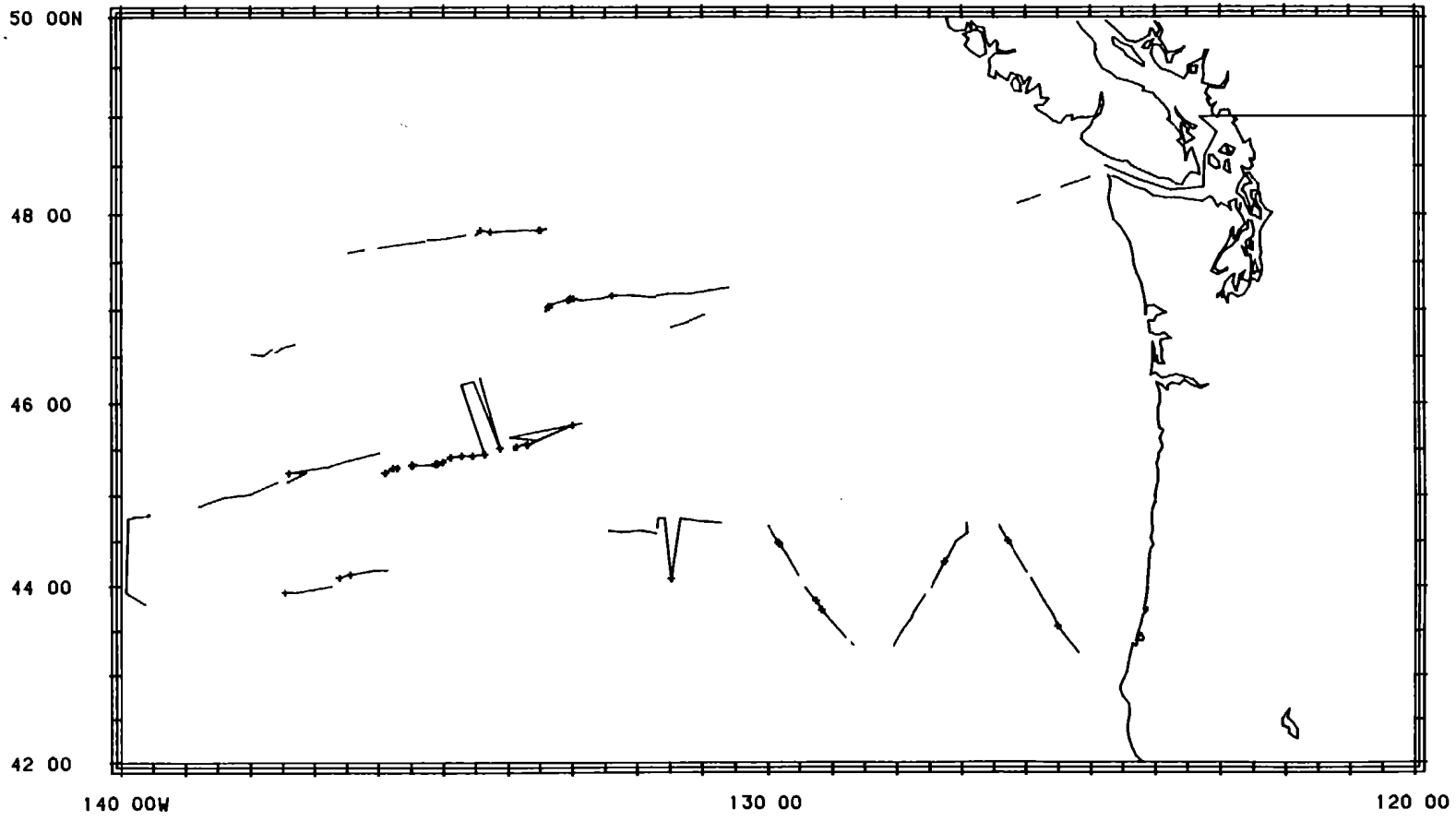


Figure 4.--Sample quality control map.