

**Walrus Islands State Game Sanctuary  
Annual Report 2001**

**Steven Rice  
Alaska Department of Fish and Game  
333 Raspberry Road  
Anchorage, AK 99518**

**November 2001**

## **Introduction**

### **Project goals**

A management plan for the Walrus Islands State Game Sanctuary was drafted in October 1992. The plan has not been finalized and no formal management goals have been developed by the Department. In the interim, the management goals for the Sanctuary are to:

- 1) protect walrus and other wildlife within the Sanctuary;
- 2) provide an opportunity for scientific and educational study of walrus; and
- 3) provide an opportunity to view, photograph, and enjoy walrus.

### **Methods and materials**

The Alaska Department of Fish and Game (ADFG) and the US Fish and Wildlife Service (USFWS) have cooperatively staffed Round Island since 1993. Under the terms of the cooperative agreement, each agency provides one wildlife technician and half the cost of transportation and supplies. This year, ADFG purchased the initial supplies and USFWS paid for additional supplies during the field season. ADFG paid for all fuel, and ADFG staff in Dillingham provided logistic support.

Steven Rice (ADFG) and Mary Cody (USFWS) were stationed on Round Island from May 14- August 10, 2001. The Sanctuary opened late this year because staff were delayed in Dillingham first by bad weather and then the onset of the herring season. George Roessler (USFWS volunteer, May 28- June 1, 2001), Marc Webber (USFWS, June 1- June 10, 2001), Joel Garlich Miller (USFWS, June 10- June 15, 2001), and Melissa McClaran (USFWS volunteer, June 15-June 25, 2001) replaced Mary Cody during four weeks of emergency leave. Duties included assisting and educating visitors; maintaining and improving island facilities; patrolling the island for access violations; monitoring walrus disturbance; and counting walrus, sea lions and seabirds. ADFG is primarily responsible for managing the Sanctuary, while USFWS takes the lead in walrus research; however, all responsibilities are shared.

### **Visitor program**

Round Island has drawn visitors from around the world for more than 20 years, and enhancing the visitor experience while protecting the island's wildlife is one of our primary responsibilities. Visitor-related duties included monitoring the radio daily and providing would-be visitors with condition reports, authorizing visits, issuing permits and collecting user fees, explaining Sanctuary rules, answering visitor questions, maintaining facilities, and assisting visitors unprepared for the island's extreme conditions.

### **Access violations/disturbances**

Boat access is restricted within three miles (4.8 km) of Round Island, and airplane access is strongly discouraged within three miles and 5,000 vertical feet (1,524 m) of the island. In addition, visitors to the island are required to stay on the trails and are not permitted on the beaches except when arriving and departing the island at Boat Cove. Staff recorded all observed access violations and reported serious violations to ADFG staff in Dillingham. Staff also attempted to contact any boat or airplane within the restricted area. No further action was taken against vessels which immediately and cooperatively responded.

Staff also monitored walrus response to both authorized and unauthorized disturbance. Staff recorded both the number of walrus affected and the degree of their response, using three distinct behaviors (head raising, reorienting, and dispersing) as measures of increasing disturbance (Kruse, 1993).

### **Walrus counts**

Pacific walrus (*Odobenus rosmarus divergens*) were counted daily throughout the summer using a standardized methodology provided by USFWS (Cody, 2001). This count methodology was initiated in 1998 and is similar to that used on the island in preceding years. The only significant difference is that counts were conducted at 2:00 PM every day instead of timing the count to coincide with the daily low tide. The new methodology also introduced regular counts of West Main Beach and interval counts designed to look at diurnal periodicity. This year walrus on West Main were counted every day beginning June 4 and interval counts occurred every three days between June 29 and July 29. Walrus on West Main and South West Main Beaches were opportunistically counted from an inflatable skiff, as weather permitted.

### **Sea lion counts**

Steller's sea lions (*Eumetopias jubatas*) hauled out at the southeast tip of the island were counted every six days throughout the summer. Sea lions were typically counted from the terrestrial observation point; however, counts were occasionally conducted from our inflatable skiff.

### **Seabird counts and research**

Counts of seabirds and seabird nests begun in 1997 were continued. All black-legged kittiwakes (*Rissa tridactyla*), common murre (*Uria aalge*), and pelagic cormorants (*Phalacrocorax pelagic*) on established plots were counted eight times. A subset of nests within these plots was selected and nesting chronology and productivity were monitored. These nests were checked approximately every other day from the time the first egg was seen through the end of the field season. This research is described in greater detail in this season's USFWS field report (Cody 2001).

### **Raven research**

Ravens visible from the Main Beach observation point were monitored for one hour each day between 5:00 AM and 1:00 AM (or from one hour before sunrise until one hour after sunset) using 10x42 binoculars and a 15x60 spotting scope. The identity and fate (eaten, cached, lost, etc) of each raven prey item, forage method (forced, opportunistic, etc.), and the total number of visible ravens were recorded with each observation. When items were cached within view, the slope of the surrounding area and dominant vegetation were recorded. Similar data was also recorded from all opportunistic observations.

Three 12-meter fox enclosures were constructed last year, and 25 chicken eggs were cached inside each enclosure and in each of three adjacent unfenced plots. Each egg was cached at a known distance and bearing from a numbered wooden stake. The differences between retrieval outside enclosures (ravens and foxes) and inside enclosures (ravens only) were to be used to estimate potential retrieval of cached eggs by foxes; however, the enclosures were blown down during the winter. It may, however, be safe to assume that any eggs that were not recovered were taken by foxes.

Steven Rice will present this research as a Master's thesis for the University of Arizona.

### **Other work**

Other opportunistic observations were recorded in the Round Island Daily Logbook. These included the first sighting of birds and mammals for the season and subsequent unusual sightings, first sightings of blooming plants, beach-cast marine mammals, and environmental conditions.

Ivory from beach-cast walrus carcasses was collected to discourage off-season trespassers and supplement state and federal funding of the program at Round Island. The Eskimo Walrus Commission will sell this ivory to other Alaskan natives, and the proceeds will be used for future walrus research and management. Ivory was collected from all accessible carcasses, but weather and the presence of other walrus limited access in some areas.



This summer, approximately 150 feet of new boardwalk was constructed through muddy areas, the cabin decking was repaired, and a rotten outbuilding was removed.

## **Results**

### **Visitor program**

Visitors traveled to the island with one of two charter services or via an independent vessel. Don's Round Island Charters (DRIC) made ten trips to the island between June 10- July 30 (DRIC made one additional trip on August 10 to pick up staff). Johnson Maritime/ Walrus Island Expeditions (JMWIE) made 18 trips between June 27- August 8. JMWIE made three additional trips to the island but did not bring visitors ashore due to rough weather. The remaining visitors traveled to the island throughout the summer via eight fishing vessels. One of these boats was accompanied by two additional fishing vessels; however, nobody from these boats came ashore.

Twenty-two campers spent a total of 108 days on the island, and the 11 administrative visitors and volunteers spent an additional 59 days on the island. Length of stay ranged from three to ten days. Fifty-nine percent of the campers were from Alaska, but campers traveled from the continental United States and Europe (Table 1). DRIC provided round-trip transportation for 82% of the campers. Two of the remaining campers traveled to the island with JMWIE, and two campers traveled to the island with DRIC and left with JMWIE.

Sixty day-visitors spent a total of 78 days on the island (seven, including the guide for JMWIE, made multiple day-visits). Thirty-seven percent of the day-visitors came from Alaska, but day-visitors also came from 11 other states and four other countries. Twenty-nine day-visitors traveled with JMWIE; the remaining 31 day-visitors reached the island independently via fishing vessels.

Total visitation to the island decreased in 2001, from 144 visitors in 2000 to 82 in 2001. The number of campers was comparable to 2000 ( $n = 24$ ), but the number of both independent and JMWIE day-visitors decreased in 2000. The delay in opening the Sanctuary this year may have caused confusion among fishermen who often visit the island immediately after the herring fishery closes. Most of the visitation by fishermen this year was squeezed into short periods between and after salmon openers. On July 21, there were three campers and 17-day visitors on the island; day-visitors took turns coming ashore to comply with the sanctuary's 17-visitor limit (generally 12 day-visitors and five campers). The decrease in JMWIE visitors probably reflects a state-wide decline in tourism this year. In addition, a fishing lodge that provided many of JMWIE's customers in 2000 did not offer the trip this year.

### **Access violations and disturbances**

Most of the walrus disturbances observed this season were caused by authorized activities within the Sanctuary (Appendix 1). These activities included visits by independent boats and charter operators and human activity at overlooks and on the beach at Boat Cove. Staff also used a 12-foot Achilles inflatable skiff with a 25 horsepower outboard motor to count walrus periodically and collect beach-cast ivory. Walrus often appeared undisturbed by this traffic (such as when visiting boats used the access corridor and no walrus were present in Boat Cove), but other authorized activities caused significant disturbance.

Low-flying aircraft can cause major disturbances at walrus haulouts (Fay 1982); however, there were few such disturbances at the Sanctuary this year (Appendix 1). A floatplane used to transport staff to and from the island on June 1 flew along the coast east of the cabin and caused at least 50-70 walrus to disperse. A helicopter was also used to transport staff and equipment to the island on May 14, but walrus were not observed during this disturbance. Only one unauthorized airplane was detected within Sanctuary airspace this year. The airplane was not seen, but was clearly audible and may have been within the boundary recommended by ADFG; walrus were not obviously disturbed by this airplane. Although ADFG does not have the authority to regulate airspace, pilots who harass walrus can be prosecuted under the Marine



Mammal Protection Act. Airplanes flying outside the recommended boundary may also disturb walrus (Rice 2000); however, these disturbances are rare and none were observed this year.

Unauthorized boats were observed within the restricted area three times this summer (Appendix 1). On August 1, the *No Wine* passed east to west along the island (may have actually circled the entire island) and approached to within 10-50 m of 1000 walrus on Main Beach; all of these walrus were disturbed and left the beach. Charges are pending against the captain and crew of this boat. Walrus were not obviously disturbed by the other two vessels, and no further action was taken in these cases. In past years, boat captains have complained that NOAA maps incorrectly indicate a 2-mile (3.2 km) restricted area around Round Island, but this does not appear to have been a factor in this season's boat incidents.

At least nine walrus disturbances occurred without any detected anthropogenic stimulus; up to 200 or more walrus were disturbed during each incident (Appendix 1). These disturbances may initially be triggered by a minor rockfall or seabird activity undetectable from our observation point and then exaggerated by the walrus's herd behavior. Walrus may also be responding to human observers, though in the above-mentioned incidents observers were not doing anything out of the ordinary to cause a disturbance. Walrus response to disturbance is unpredictable and probably influenced by group size, time spent hauled out, environmental conditions, and other factors.

### **Walrus counts**

Walrus hauled out on the east-side beaches of Round Island were counted on 87 consecutive days between May 15 and August 9 (Figure 1). The peak east-side count of 4017 walrus occurred on July 22 (there were also 805 walrus on West Main beach on this day). The minimum east-side count was 226 walrus on July 15. The average east-side count for 2001 was 1271 walrus.

West Main Beach was counted a total of 66 times between June 4 and August 8 (Figure 1). West Main counts were initiated late in the season because Traverse Trail was snow-covered and dangerous until early-June. The peak West Main count of 965 walrus was on June 7. No walrus were present on West Main Beach on 10 count days throughout the summer. The average West Main count was 266 walrus.

### **Steller's sea lion counts**

Steller's sea lions hauled out at the southern tip of the island (East Cape) were counted 15 times between May 16- August 8 (Table 2). The peak count of 368 sea lions (combined land and water count) occurred on May 22; the low count of zero sea lions occurred on July 15; the mean count was 111 sea lions. Sea lions were often seen swimming around the island, alone or in small groups; however, sea lion and walrus herds at Round Island are almost entirely segregated and do not generally use the same beaches.

### **Seabird research**

Cormorant productivity was monitored beginning May 16 through August 9; kittiwake and murre productivity were monitored from the time the first kittiwake egg was observed on June 3 through August 9. At the time this report was written, seabird population and productivity data had not been analyzed; these results will be presented in the USFWS summer field report.

### **Raven Research**

Raven behavior data for 2001 has not yet been analyzed; however, preliminary analysis indicates that seabirds, seabird eggs and chicks comprise the bulk (up to 90%) of the summer diet of Round Island ravens. Black-legged kittiwake and common murre eggs were the most common prey items this summer. Ravens predation on Main Beach seabird nests was estimated to exceed 5,000 eggs this summer, and predation may have been a factor in the relatively poor seabird productivity this season. Other food items included adult and chick kittiwakes and murre, kittiwake and cormorant eggs, adult puffins (*Fratercula* sp.), voles (*Microtus* sp.), insects, dead fish, berries, and other unidentified items. At least seven raven pairs are believed to nest on the island, and five nest sites have been identified. One pair nesting at North



Boat Cove in 2000 moved their nest approximately 150 m to the west this season. All known nests successfully fledged young this season, but the number of fledglings ranged from one to six.

This year's raven banding effort was largely unsuccessful. One juvenile raven was trapped by hand in mid-July and banded with USFWS leg band #1497-26602 and observed periodically for the next month. No other birds were trapped. Ravens at Round Island have ample food and are not easily tempted into traps.

### **Other observations**

Foxes used the dens behind the cabin and near the sea lion observation point this summer; each of these dens produced at least one pup. Visitors reported another den high above North Boat Cove, but staff were unable to confirm this observation. No kits were seen in the West Main observation area or on top of the island (infrequently visited) where dens have been reported in the past.

Approximately 16 walrus carcasses were observed this year. Only 10 carcasses were observed on the island in 2000 and five in 1999, so this season's mortality appears to be relatively high. Both charter operators indicated that they had observed slightly higher than usual numbers of carcasses in Bristol Bay this season. Staff at other haulouts should be interviewed to determine whether there was a regional trend toward increased mortality. Cause of death was not apparent for any of the carcasses that washed ashore on Round Island. All of these carcasses had ivory when they washed ashore; staff collected ivory from 13 carcasses but were unable to reach the other carcasses before they floated away. Several loose pieces of ivory were also found during beach-walks.

## **Discussion**

### **Visitor program**

Visitation to Round Island has been highly variable since the Sanctuary's inception. It is affected by the success and timing of commercial fishing in Bristol Bay, the number of charter operators and the amount of effort they put into attracting clients, ADFG budget and ability to staff the island, national and international economic conditions, and other factors. A peak of 305 visitors (including 14 campers, 9 day-visitors, and >250 tour boat day-visitors) was reported in 1978 (summarized in Koenen 1996). Total visitation fluctuated between 58 and 273 through the '80's, but was high near the end of the decade. Visitation dropped again to a low of 61 visitors (including 18 campers, 41 day-visitors) in 1994, and stayed low in 1995 and 1996. This slump was largely attributed to the uncertainty of transportation during this period when only one charter service was operating (Koenen and Spencer 1994; Koenen and Kruse 1995). In 1996, many foreign and out-of-state visitors cancelled their visits in response to the uncertainty of legislative funding for Round Island (Koenen and Rice 1996). Recently, the addition of a second charter service in 1997 and adequate legislative funding in the past four years have strengthened the Round Island visitor program. However, the program remains vulnerable to a number of factors currently beyond our control.

### **Walrus counts**

As many as 14,000 walrus have been counted at Round Island in a single day (summarized in Koenen, 1996). The peak east-side count in recent years was 9,550 walrus in 1995, but the peak count declined to a low of 1,746 walrus in 1998 (Raymond 1998). Peak east-side counts in 1999 and 2000 were 4207 and 7573 respectively. Including walrus on West Main Beach, the peak counts for 1999 and 2000 were 4827 and 8716 respectively. The number of walrus using Round Island is no doubt affected by a number of diverse elements. One such factor is the increased use of other haulouts including Capes Peirce, Newenham, and Seniavin. These haulouts had been all but abandoned by the time the Walrus Islands State Game Sanctuary was established, but they now rival Round Island as important walrus haulouts. Cape Peirce, in particular, reached a peak count of 12,500 in 1985. Walrus move between the haulouts and often peak at Cape Peirce after the Round Island field season; however, extremely high use of other haulouts may reduce walrus use of Round Island. At the time this report was written, Togiak National Wildlife Refuge and the Marine Mammals Management office of USFWS had not released count data from these

other haulouts for the 2001 season, but preliminary reports indicated low walrus numbers at Cape Peirce during the Round Island field season (MacDonald, pers. comm.).

Since 1996, Bristol Bay area natives have also been given limited access to Round Island for a traditional hunt of up to 20 walrus, including struck and lost animals. In the fall of 2000, hunters from three villages harvested seven walrus at Round Island. However, this hunt occurs between September 20-October 20 and there are usually less than 200 walrus on the island during this period. Because disturbance is minimized in this manner, and because walrus numbers began to rebound in 1999 and 2000, it seems unlikely that this limited hunt has affected walrus use of Round Island.

### **Recommendations**

- 1) Continue to follow walrus count protocols initiated in 1998. Continue daily counts of walrus on West Main beach. Research remote sensing technologies that would allow daily counts of West Main and South West Main beaches, as well as provide a better view of Main Beach.
- 2) Use aerial photographs and walrus count data to generate a correction factor for each observer.
- 3) Weather permitting, initiate regular whole-island seabird surveys at five-year intervals.
- 4) Work cooperatively with other agencies to broaden the scope of Round Island research and better monitor the entire ecosystem.
- 5) Continue to protect walruses and other wildlife within the Sanctuary, while providing an opportunity for scientific study and enjoyment of the Sanctuary.
- 6) Build a visitor cook shelter near the visitor spring. Have a carpenter evaluate the staff cabin and determine whether it is more cost effective to repair or replace the building.
- 7) Only activate one of the two ADFG handheld satellite telephones. The account card from the active phone can be used in either phone, so there is no reason to pay fees for both. The USFWS satellite phone is also available as backup.
- 8) Provide law enforcement training to staff.
- 9) Purchase a portable defibrillator. Defibrillators are available for approximately \$3000 and require little training to operate.

### **Acknowledgements**

First and foremost, I would like to thank Mary Cody for all of her help in and out of the field. I would also like to thank Colleen Matt, Jim Woolington, Eunice Dyasuk, Don Winkleman, Cathy Yahr, Terry Johnson, George Roessler, Marc Webber, Joel Garlich-Miller, and Melissa McClaran for their help and support during the field season.



### Literature cited

Cody, M. 2001. Round Island Field Report: May 14- August 10, 2000. USFWS rept. Marine Mammals Management. Anchorage, AK.

Fay, F.H. 1982. Ecology and biology of the Pacific walrus, *Odobenus rosmarus divergens illiger*. USFWS. N. American Fauna No. 74, Washington, D.C. 279pp.

Koenen, K. 1996. Round Island Chronology (1968-1996). ADFG rept. Anchorage, AK.

Koenen, K. and S. Kruse. 1995. Walrus Islands State Game Sanctuary Annual Report. ADFG rept. Anchorage, AK.

Koenen, K. and S. Rice. 1996. Walrus Islands State Game Sanctuary Annual Report. ADFG rept. Anchorage, AK.

Koenen, K. and T. Spencer. 1994. Walrus Islands State Game Sanctuary Annual Report. ADFG rept. Anchorage, AK.

Kruse, S. 1993. Round Island Summer Field Report. USFWS rept., Marine Mammals Management, Anchorage, AK.

MacDonald, R. Pers. comm. Togiak National Wildlife Refuge, Dillingham, AK.

Raymond, R. 1998. Walrus Islands State Game Sanctuary Annual Report. ADFG rept. Anchorage, AK.

Rice, S. 2000. Walrus Islands State Game Sanctuary Annual Report 2000. ADFG rept. Anchorage, AK.



Table 1. State or country of origin of Round Island visitors, summer 2001.

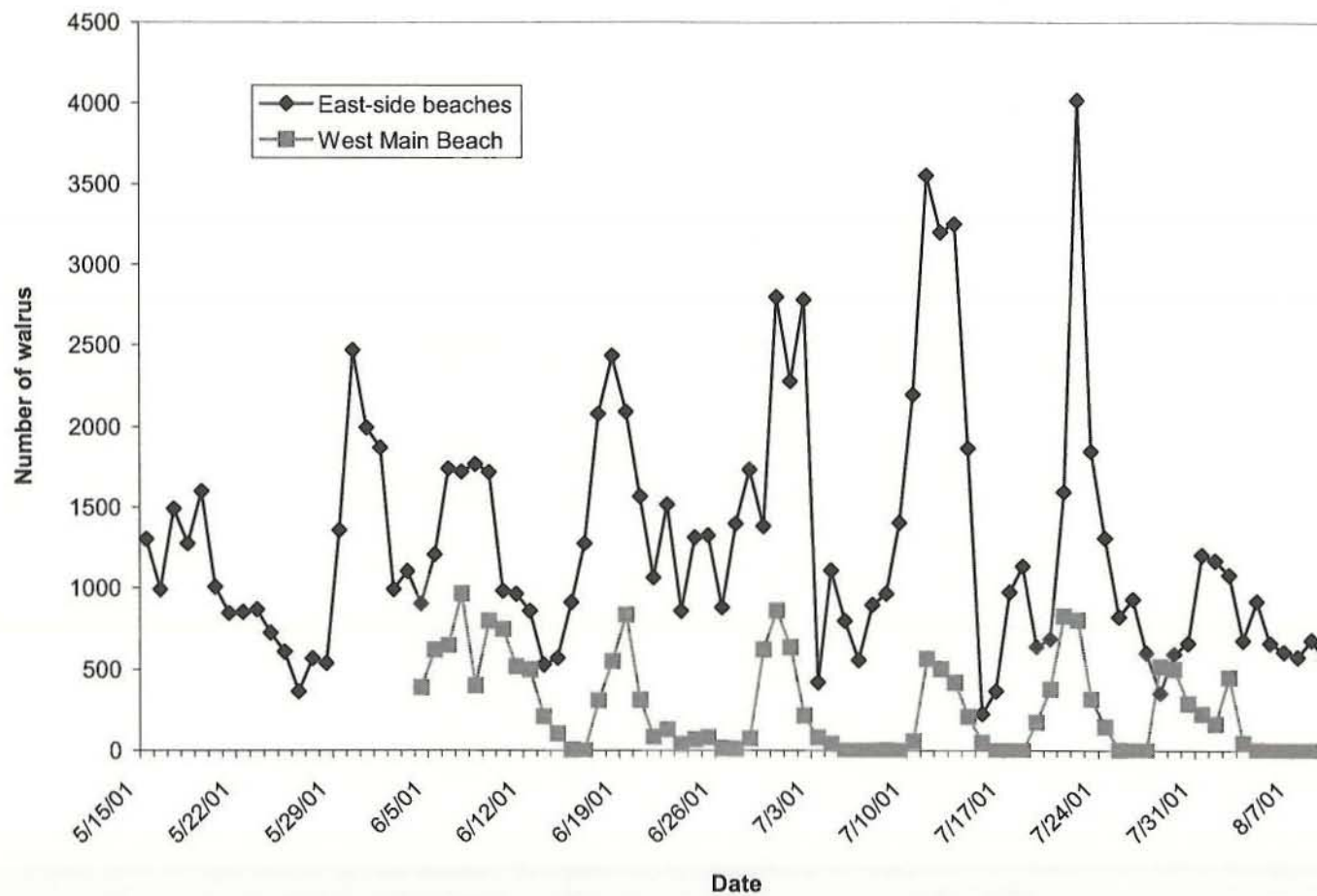
Origin	Campers	Independent day-visitors	JMWIE day-visitors
Alaska	13	13	9
California	2	1	
Colorado	2		1
Hawaii		2	
Massachusetts			2
Minnesota			1
New Jersey			1
Oregon		1	
Pennsylvania		1	1
Tennessee			2
Texas	1		
Washington	1	13	2
Wisconsin			2
Australia			2
Austria	2		
France			2
Germany	1		2
Switzerland			2
<b>Total</b>	<b>22</b>	<b>31</b>	<b>29</b>

Table 2. Counts of Steller's sea lions at Round Island, Alaska; May 16- August 8, 2001.

<b>Date</b>	<b>Land count</b>	<b>Water count</b>	<b>Total</b>
5/16/01	264	38	302
5/22/01	356	25	368
5/28/01	273	35	308
6/3/01	91	62	154
6/9/01	140	9	148
6/16/01	101		101
6/21/01	15	9	24
6/28/01	6	1	7
7/3/01	6	4	10
7/9/01	46	0	46
7/15/01	0	0	0
7/21/01	16	0	17
7/27/01	79	0	78
8/2/01	27	9	38
8/8/01	47	0	47
<b>Mean value</b>	<b>98</b>	<b>14</b>	<b>110</b>



Figure 1. Mean daily east-side and West Main Beach counts of walrus on Round Island, Alaska; May 15-August 9, 2001.



Appendix 1. Round Island access violations and walrus disturbances. Unless otherwise noted, visiting boats were only monitored as they approached the island and not during departure. HR= head raising; OR= reorienting; and DS= dispersing. WM = West Main Beach; MB = Main Beach; NBC = North Boat Cove; FR = Flat Rock; BC = Boat Cove; CG = Campground Beach; FB = First Beach; FP = First Prime; S = Second Beach; and SP = Second Prime. Walrus response to boats or airplanes outside the restricted area was not recorded.

Date	Approximate start time	Disturbance type	Closest approach to island	Elevation	Walrus response	Comments
5/14/01	1000	Staff transport via helicopter and boat.	Boat anchored about 100 m offshore, helicopter lands on island.	0 m	Unknown.	Staff arrive via helicopter and helicopter slings loads ashore from boat. Walrus not observed.
5/14/01	1600	Authorized visit by independent boat.	Anchored at about 100 m, beached skiff.	N/A	Unknown.	No walrus in BC area; walrus not observed elsewhere.
5/16/01	0807	Authorized visit by independent boat.	Anchored at about 200 m, beached skiff.	N/A	1 HR/OR twice then DS from FR.	Several walrus in water group together and orient toward boat, eventually disperse.
5/22/01	Unknown.	Possible unauthorized visit by independent boat.	3-6 km	N/A	Unknown.	Boat may have been within the restricted area but did not respond to radio hail. Walrus not observed.
5/25/01	Unknown.	Possible unauthorized visit by airplane.	Unknown.	Unknown.	No obvious response.	Airplane not seen but clearly audible during MB count.
5/28/01	Unknown.	Staff exchange via boat.	Anchored at about 200 m, beached skiff.	N/A	Unknown.	No walrus in BC area, but boat approached from east along beach so disturbance at FB or S possible.
5/29/01	Unknown	Authorized staff skiff operations.	Beached skiff 1.5 km from walrus.	N/A	Unknown.	No walrus in BC area; walrus not observed elsewhere. Testing outboard in BC area.
6/1/01	1740	Staff exchange via floatplane.	.5 km, skiff to and from shore.	0 m	1 HR/OR/DS from high on FR; 30-40 at S and 20-30 at FB HR/OR/DS.	Plane flying approximately 500' AGL along east side of island causes slow dispersal from FB and S- no injuries observed. Walrus in BC



						area restless, but minor disturbance.
6/1/01	1815	Authorized staff skiff operations.	Beached skiff about 100 m from walrus.	N/A	3 HR/OR and DS to waterline.	Beached skiff near small group of walrus on MB to retrieve ivory.
6/4/01	1700	Authorized staff skiff operations.	Passed 100 m from walrus on WM; beached skiff at BC.	N/A	3 HR/OR and partial DS from WM; 1 HR/OR at FR.	No obvious walrus disturbance at any other beach, but majority of 200 sea lions HR/OR and DS to waterline. Took skiff around island to count walrus.
6/8/01	1803	Unknown- possibly caused by staff counting from WM OBP.	50 m.	50 m.	120 HR/OR/DS into water; most settle w/i 5 m of shore but ~10 DS completely.	No human stimuli observed other than staff standing at OBP.
6/10/01	0915	Authorized visit by charter operator.	100 m; beached skiff.	N/A	5 HR/OR/DS from FR; walrus at CG and BC not obviously disturbed.	Walrus left FR as boat begins to leave the island. High water so injury unlikely.
6/15/01	1020	Authorized visit by charter operator.	100 m; beached skiff.	N/A	Unknown.	No walrus in BC area; walrus not observed elsewhere.
6/16/01	1030	Authorized staff skiff operations.	Beached skiff at BC.	N/A	3 HR and 1 DS from FR as we left BC; no other obvious disturbance.	Took skiff around island to count walrus.
6/20/01	1055	Authorized visit by charter operator.	100 m; beached skiff.	N/A	≥1 HR at FR and one in water DS; no obvious disturbance.	
6/23/01	1830	Authorized staff skiff operations.	Passed w/i 100-150 m of walrus at FR, tip of MB and WM; beached skiff at BC.	N/A	10-20 HR at MB; no other obvious disturbance.	Took skiff to WM to count walrus.
6/25/01	1045	Authorized visit by charter operator.	100 m; beached skiff.	N/A	1 HR/OR/DS from BC before boat arrives in response to campers on beach; walrus not observed after boat arrives.	Rough conditions preclude monitoring walrus behavior after boat arrives.
6/27/01	Unknown.	Authorized visit by charter operator.	150 m; beached skiff.	N/A	No obvious disturbance of walrus on land but walrus in	Staff not present when boat arrived; disturbance reported by visitors. Boat

					water group together and then DS.	departed several hours later and departure was not monitored.
6/29/01	1750	Unknown- possible rockfall.	N/A	N/A	~150 HR/OR and 10-15 DS into water from MB4.	Approximately 350-400 walrus on MB4; approximately 500 walrus on other parts of MB not obviously disturbed.
6/29/01	1803	Unknown.	N/A	N/A	~50 HR; 10 of these OR and DS to waterline and 30 more OR/DS completely.	
6/29/01	2000	Visitor off trail at FB.	30 m.	30 m.	No obvious disturbance.	Visitor off trail twice in same area, but approximately same distance from walrus as at FB OBP.
6/29/01	2030	Authorized staff skiff operations.	Passed w/i 100 m of walrus on FR; beached skiff at MB and BC.	N/A	10 HR/OR and 2 DS from FR. Approximately 4' above water, but no obvious injuries. 1 HR/OR from FR during return. No other obvious disturbance.	Took skiff to FB and MB to collect ivory.
6/30/01	0900	Authorized visit by charter operator.	150 m; beached skiff.	N/A	~20 HR and 3-4 HR/OR/DS from FR. Group of ~20 walrus swim to w/i 60 m of boat.	Boat departed several hours later and departure was not monitored.
6/30/01	1000	Authorized visit by charter operator.	100 m; beached skiff.	N/A	Walrus on FR appear restless and 40+ in water group together within 30 m of boat. Walrus in water begin to DS approximately 35 min later as engines start.	
6/30/01	1530	Staff counting from FB OBP.	30 m.	30 m.	~10 in nearshore water DS 5-10 m further into water.	Walrus DS as staff stand after completing count.
6/30/01	1902	Staff counting from WM OBP.	60 m.	60 m.	~20 HR and 7-10 OR/DS from MB4.	
7/1/01	0830	Authorized visit by charter operator.	200 m; beached skiff.	N/A	30 HR/OR begin to DS; ~24 DS into water.	Boat sits in BC for ~75 min before skiff to shore; charter operator did not observe any disturbance during this period. Staff monitor walrus as skiff to shore. Walrus scattered around BC so alternate landing area used.



7/1/01	1820	Departure of above authorized charter operator.	200 m; skiff to boat from shore.	N/A	~10 HR, 6 OR, and 2 DS	
7/5/01	Unknown	Authorized visit by charter operator.	150 m; skiff to shore.	N/A	Unknown.	No walrus in BC area; walrus not observed elsewhere. Charter operator decided too rough to bring visitors ashore so left island within approximately 1/2 hour.
7/6/01	Unknown.	Authorized visit by charter operator.	150 m; skiff to shore.	N/A	Unknown.	No walrus in BC area; walrus not observed elsewhere. Charter operator decided too rough to bring visitors ashore so left island within approximately 1/2 hour.
7/8/01	1510	Authorized staff skiff operations.	Skiff beached within about 100 m of 2 walrus on WM.	N/A	2 HR/OR/DS at WM.	No walrus in BC area and walrus on MB not obviously disturbed.
7/10/01	0830	Authorized visit by charter operator.	150 m; skiff beached.	N/A	1 HR/OR/DS and approximately 50 walrus in water investigate the boat.	Staff not present when boat arrives; disturbance reported by charter operator.
7/10/01	1031	Authorized visit by charter operator.	100 m; beached skiff.	N/A	No obvious disturbance; walrus which had been in water near other charter boat disperse shortly before second boat arrives.	
7/10/01	1634	Departure of authorized charter operator.	150 m; skiff to boat from shore.	N/A	2-3 HR.	Staff left BC area before boat left BC but walrus appeared relatively undisturbed.
7/13/01	1600	Authorized visit by charter operator.	150 m; beached skiff.	N/A	1 HR	
7/13/01	1808	Departure of above authorized charter operator.	150 m; skiff to boat from shore.	N/A	>5 HR and 1 OR.	
7/15/01	1550	Unknown- possibly caused by staff counting walrus.	N/A	N/A	"Lots" of HR.	
7/16/01	Unknown.	Authorized visit by charter operator.	100 m; beached skiff.	N/A	Unknown.	No walrus in BC area; walrus not observed elsewhere.

7/17/01	1021	Authorized visit by charter operator.	150 m; beached skiff.	N/A	Unknown.	No walrus in BC area and no obvious disturbance at MB; walrus not observed elsewhere.
7/17/01	1100	Authorized visit by charter operator.	150 m; beached skiff.	N/A	Unknown.	No walrus in BC area; walrus not observed elsewhere.
7/17/01	1545	Unknown.	N/A	N/A	Several hundred walrus HR/OR/DS from MB.	Visitors report disturbance but no obvious cause.
7/17/01	1630	Authorized staff skiff operations.	200 m; beached skiff.	N/A	Unknown.	No walrus in BC area and no obvious disturbance at MB; walrus not observed elsewhere. Took skiff to WM to collect ivory.
7/17/01	2030	Departure of above authorized charter operator.	150 m; skiff to boat from shore.	N/A	Unknown.	No walrus in BC area; walrus not observed elsewhere.
7/20/01	0930	Authorized visit by independent boat.	100-200 m; beached skiff.	N/A	Multiple HR, but walrus seemed relatively undisturbed.	Crew make three skiff trips between boat and shore; a few HR each time skiff in/out.
7/21/01	0955	Authorized visit by charter operator.	100 m; beached skiff.	N/A	>20 HR.	Walrus enters rear of BC during disturbance but swims off as skiff makes second trip to boat.
7/21/01	1320	Authorized visit by independent visitors.	75 m; beached skiff.	N/A	35-45 HR and ~11 OR/DS	Three boats bring 17 day visitors to island. First two boats arrive too far to the east and returned to BC along shore- possible additional disturbance at beaches east of cabin. Approximately 11 walrus on FR agitated but do not DS until third boat arrives and anchors close to rock at 1453- all DS. See also below.
7/21/01	1800	Unauthorized boat traffic.	200 m.	N/A	No obvious disturbance at MB and no walrus in BC area.	One of above boats leaves BC and approaches to within 200m of walrus on MB. Captain later indicated that he had misunderstood the rules; no charges filed because no disturbance and excellent behavior while on island supported claim.
7/23/01	0830	Authorized visit by charter operator.	150 m; beached skiff.	N/A	>40 HR and ~23 OR/DS.	Walrus appeared very restless when boat still more than one mile offshore and 20 already in water. Group of about 40 walrus in water investigates boat from about 50 m.
7/23/01	1730	Departure of above	150 m; skiff	N/A	No obvious disturbance at	

		authorized charter operator.	returns to boat.		BC; walrus not observed elsewhere.	
7/24/01	1200	Authorized staff skiff operations.	75 m; beached skiff.	N/A	3 HR and 1 OR/DS.	Attempted to take skiff around island but too rough so turned back at SP.
7/25/01	1006	Authorized visit by charter operator.	100 m; beached skiff.	N/A	No obvious disturbance at BC; walrus not observed elsewhere.	
7/25/01	1917	Authorized staff skiff operations.	100 m; beached skiff.	N/A	Multiple HR by 3 walrus on FR and some on MB HR but no obvious disturbance there or other beaches. 1 HR/OR/DS from BC as skiff returns.	Sea lions may have been disturbed- seemed restless.
7/25/01	2220	Authorized visit by charter operator.	150 m; beached skiff.	N/A	No obvious disturbance at BC; walrus not observed elsewhere.	
7/26/01	0900	Visitors at S OBP.	Unknown.	N/A	Possibly up to ~68 HR/OR/DS.	Walrus appeared restless while campers standing at OBP- staff asked campers to sit. Other campers later overheard describing dispersal of all S walrus in response to above campers.
7/26/01	1449	Authorized visit by independent boat.	200 m; beach kayak.	N/A	3 HR.	
7/26/01	1750	Departure of above authorized independent boat.	200 m; kayak returns to boat.	N/A	~4 HR.	
7/27/01	0930	Authorized visit by charter operator.	200 m; beached skiff.	N/A	>30 HR and 1 probable HR/OR/DS.	Walrus in BC landing area so skiff beached 50m north of usual area. Departure not observed.
7/27/01	1110	Authorized staff skiff operations.	150 m; beached skiff.	N/A	Several HR but no obvious disturbance at BC; 6 HR and 1 HR/OR/DS at SP.	Took skiff around island.
7/27/01	Unknown	Authorized visit by independent boats.	Unknown.	N/A	No walrus in BC area; walrus not observed elsewhere.	
7/28/01	1030	Authorized staff skiff operations.	100-150 m; beached skiff.	N/A	>12 HR at FR; not obviously disturbed at other	Took skiff out to collect ivory from MB.



					beaches.	
7/29/01	Unknown	Possible visitors off trail at FB.	Unknown.	N/A	Possibly ~120 HR/OR/DS.	Walrus numbers decline rapidly over 4-hour period and grass appeared to have been trampled off trail.
7/30/01	1020	Authorized visit by charter operator.	100 m; beached skiff.	N/A	Up to 10 HR.	Boat arrives at BC before staff so additional disturbance possible.
7/30/01	1300	Authorized visit by charter operator.	200 m; beached skiff.	N/A	6 HR and 2 OR/DS.	Departure not observed but see 1803 observation.
7/30/01	1700	Unknown	N/A	N/A	> 50 HR/OR/DS.	Walrus leaving WM rapidly during 1/2 hour count but not panicked and no obvious disturbance.
7/30/01	1803	Unknown.	N/A	N/A	>200 HR/OR/DS.	Walrus begin panicked dispersal at same time 1000 seabirds flush from cliff. No obvious cause, but departing charter boat faintly audible 10 minutes later at approximately 3 miles offshore.
7/31/01	1230	Authorized visit by charter operator.	150 m; beached skiff.	N/A	No walrus in BC area; walrus not observed elsewhere.	
8/1/01	Unknown.	Authorized visit by charter operator.	150 m; beached skiff.	N/A	Unknown.	Staff did not observe disturbance.
8/1/01	1550	Departure of above authorized charter operator.	150 m; returned skiff to boat.	N/A	>3HR.	Staff left BC before boat so additional disturbance possible.
8/1/01	1808	Unauthorized boat traffic.	< 10- 50 m.	N/A	~1000 HR/OR/DS.	Boat passes along all beaches between CG and MB within 200 m of shore (may have circled entire island before staff observed). Approached to within 10-50 m of walrus on MB and then sat offshore for more than 1/2 hour until staff intercepted using skiff. Additional disturbance likely at beaches east of cabin.
8/1/01	Unknown.	Unknown.	N/A	N/A	~130 HR/OR/DS.	Visitors report 2/3 of approximately 200 walrus on FB disperse without any obvious stimuli; additional disturbance at S possible.
8/2/01	1530	Authorized visit by charter operator.	150 m; beached skiff.	N/A	Walrus at FB appeared slightly restless but not	

					obviously disturbed; walrus not observed elsewhere.	
8/2/01	2008	Departure of above authorized charter operator.	150 m; skiff returned to boat.	N/A	~6 HR.	
8/3/01	1030	Authorized visit by charter operator.	150 m; beached skiff.	N/A	No walrus in BC area; walrus not observed elsewhere.	
8/3/01	1630	Departure of above authorized charter operator.	150 m; beached skiff.	N/A	No walrus in BC area; walrus not observed elsewhere.	
8/3/01	Unknown	Authorized staff skiff operations.	300 m; beached skiff.	N/A	~100 HR/OR and begin to DS; ~20 DS into water.	Took skiff to MB to collect ivory. Beached skiff ~300 m from walrus and walked quietly to 150-200 m from walrus- turned back when walrus began to DS.
8/5/01	0800	Authorized staff skiff operations.	100 m; beached skiff.	N/A	2 HR and possibly OR/DS.	Took skiff to WM to collect ivory. Walrus HR as skiff leaves and gone by time skiff returns.
8/5/01	0900	Authorized visit by charter operator.	150 m; beached skiff.	N/A	No walrus in BC area; walrus not observed elsewhere.	
8/5/01	1330	Departure of above authorized visit by charter operator.	150 m; beached skiff.	N/A	No walrus in BC area; walrus not observed elsewhere.	
8/5/01	2140	Authorized visit by charter operator.	150 m; beached skiff.	N/A	No walrus in BC area; walrus not observed elsewhere.	
8/5/01	Unknown	Unknown.	N/A	N/A	17 HR/OR/DS.	Visitors report 17 of 20 walrus leave FB while they were sitting at the OBP. No obvious stimuli.
8/6/01	1000	Authorized visit by charter operator.	150 m.	N/A	No walrus in BC area; walrus not observed elsewhere.	Charter operator decided too rough to bring visitors ashore so left island within approximately 1/2 hour.
8/7/01	0830	Authorized visit by charter operator.	150 m; beached skiff.	N/A	No walrus in BC area; walrus not observed elsewhere.	
8/7/01	1700	Departure of above authorized charter	150 m; skiff returned to	N/A	No walrus in BC area; walrus not observed	

		operator.	boat.		elsewhere.	
8/7/01	1230	Authorized staff skiff operations.	<200 m; beached skiff.	N/A	No walrus in BC area; walrus not obviously disturbed elsewhere.	Took skiff around island.
8/8/01	1030	Authorized visit by charter operator.	150 m; beached skiff.	N/A	No walrus in BC area; walrus not observed elsewhere.	
8/10/01	0040	Unauthorized visit by independent boat.	< 3 miles.	N/A	Unknown.	Boat appeared to be less than 3 miles away (only running lights visible). Walrus not observed.
8/10/01	~1030	Authorized visit by charter operator.	<100 m.	N/A	Multiple HR by 8-10 walrus; all OR/DS.	Boat beached at BC and staff load field gear directly onto boat. All walrus on FR DS.