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Round Island 2002 Field Report

May 13 - August 12, 2002



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Summary

Alaska Department of Fish and Game and U. S. Fish and Wildlife Service Personnel arrived on Round Island on May 13, 2002 and departed Round Island on August 12, 2002. We counted walrus (*Odobenus rosmarus*) on all east side beaches daily from May 13, 2002 through August 11, 2002. We counted walrus on west main beach daily from May 26, 2002 through August 10, 2002. Total island counts ranged from a low of 111 walrus on July 13 to a high of 3371 walrus on May 29, 2002. The average number of walrus on Round Island was 1031 in 2002, compared to 1459 in 2001 and 2242 in 2000. Warm weather, ice conditions over the winter, or disturbance from low-flying planes may all have contributed to the relatively low numbers of walrus using the Round Island haul out this year. We monitored seabird plots for both population size and productivity. Common murre (*Uria aalge*), black-legged kittiwakes (*Rissa tridactyla*) and pelagic cormorants (*Phalacrocorax pelagicus*) fledged chicks from 4%, 34% and 70% respectively of the eggs laid. The number of common murre and black-legged kittiwakes remained the same or increased slightly for each species on all plots when compared with the 2001 counts. Pelagic cormorants moved or were absent from plots used in 2000 and 2001. We counted Steller sea lions (*Eumetopias jubatus*) at the East Cape haul out every six days. Counts of Steller sea lions ranged from a low of 20 on July 12 to a high of 449 on May 17, 2002. An average of 120 Steller sea lions used the east cape haul out throughout the summer, as compared to an average of 98 in 2001 and 85 in 2000. In June, sanctuary staff worked with USGS and USFWS biologists on a pilot study examining the feasibility of using a crossbow and dart system to retrieve skin samples from walrus resting on the haul out for later DNA analysis. In July, two interns spent a month working with staff as part of a joint USFWS/BBNA program designed for Bristol Bay area Native college students majoring in natural resource management or related fields. Steve Rice continued a study of raven (*Corvus corax*) predation upon seabirds for a third year. This year, we extended a pilot project examining the feasibility of using ground-based photos to improve walrus count accuracy. We also experimented with using a grid system to delineate and count plots of walrus on haulout beaches. In addition, we administered a visitor program, monitored haulout disturbance, and performed routine maintenance and improvement of the trails and facilities on the island.

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Introduction

The summer of 2002 marked the tenth consecutive year of a cooperative program between the Alaska Department of Fish and Game (ADF&G) and the Marine Mammals Management Division (MMM) of the U. S. Fish and Wildlife Service (USFWS). The two agencies provide staff and funding to monitor Pacific walrus (*Odobenus rosmarus*), Steller sea lion (*Eumetopias jubatus*), and seabird populations on Round Island while also administering an internship program with the Bristol Bay Native Association, a visitor program, monitoring haulout disturbance, and maintaining and improving trails and facilities on the island. We plan on renewing the cooperative agreement between the two agencies for another five years in the spring of 2003. Round Island is located within the Walrus Islands State Game Sanctuary and has traditionally supported the largest number of walruses of the four terrestrial walrus haul outs in Bristol Bay, Alaska. The other terrestrial walrus haul outs located in Bristol Bay are Cape Pierce and Cape Newenham, both within the Togiak National Wildlife Refuge (TNWR), and Cape Seniavin located on the Alaska Peninsula northeast of Port Moller (Figure 1). Cape Pierce and Cape Newenham are both monitored by TNWR staff. In 1998, 1999 and 2001, Cape Seniavin was monitored by MMM staff. This report provides a basic synopsis of walrus numbers throughout the summer, walrus disturbance events, Steller sea lion counts, seabird research and the internship program conducted on Round Island during this summer field season. For more information on the visitor program, raven (*Corvus corax*) research, trail and cabin maintenance, see the ADF&G report (Rice 2002).

Methods

Weather

We collected the following weather information daily near the cabin at the start of the walrus count: current wind speed and direction, current cloud cover and type of precipitation (if any.) The maximum and minimum temperature for the preceding 24 hours, and the amount of precipitation over the preceding 24 hours were recorded as near to 1400 hours as possible. In addition, the barometer was recorded daily at 0800 and at 2000.

Walrus Monitoring

Walrus haul out on nine beaches on the east side of Round Island and on two beaches on the west side of Round Island (Figure 2). All accessible east side beaches were counted daily from May 14 through August 11, at 900, 1400 or 1730 hours. Snow fall left avalanche chutes along the trail leading to west main beach impassable and also prohibited us from setting up the boat and boat anchor system until May 26. From May 26 through August 10, west main beach was counted daily, usually from land or occasionally from a skiff. During all counts, each observer counted independently using 10 x 42 or 7 x 32 binoculars. Each beach was counted three times by each observer using a separate tally meter for each count. If ten or fewer walruses were present, we did not use tally meters. We found that tally meters became an additional source of error rather than adding precision when so few animals were being counted. Observers did not discuss or compare numbers during counts. After three counts, observers would compare

numbers and try to locate where discrepancies may have occurred. If the observers felt that the amount of variation in their counts was excessive (20% or more) and had time, additional counts were done. These multiple counts by multiple observers have been analyzed by Mark Udevitz of the Biological Resource Division (BRD) of the U. S. Geological Survey (USGS) to determine the amount of variability within and among observers at all haul outs. For purposes of this report, all counts by all observers at each beach were averaged.

The nine beaches along the east side of Round Island were counted in the following order during each count: second prime (SP,) second beach (S,) first prime (FP,) first beach (FB,) campground (CG,) boat cove (BC,) flat rock (FR,) north boat cove (NBC,) and main beach (MB). West main beach was counted immediately after the east side beaches. West main beach south (WMS) is only visible by skiff, and was only counted twice during this summer. It is not included in west side counts or in daily averages or totals in this report. However, we have rarely seen more than 50 walruses on west main beach south and often don't see any there, so it probably does not significantly affect total numbers for Round Island.

The following information was recorded by each observer during each count: start time, end time, type of count, Beaufort sea state, beach condition, beach availability and beach used, visibility, land and water counts, and count quality. Walrus counts were divided into categories and each count was recorded as one of the following: a scheduled count of east side beaches, a boat count of any beach, a land-based count of west main beach, or any count done opportunistically that did not fit into the other categories. For beach condition, we used a scale based on the size of waves breaking on the beach: calm, wave height up to three feet, or wave height greater than three feet. Beach availability was recorded as a percentage in quartiles from 0 to 125% based on the amount of beach visible at mean low tide. Mean low tide was recorded as 100%. Beach used was recorded in 5 percent increments from 0 to 100%. Visibility was a subjective measure of whether any walrus were hidden by obstacles, such as rock walls or fog, and was recorded as clear, partially obscured or obscured. Land counts included all walruses on the beach and those in the surf zone. Water counts included all walruses in the water within ten meters of shore. Count quality was a subjective measure of how accurate the observer felt the count was and was recorded as excellent, good, fair or poor. Count quality was recorded before looking at the actual count recorded on the clicker. For a more complete copy of the count protocols, see Appendix A.

In past years, every effort was made to have both observers count each beach together on each day. In 2002, less emphasis was placed on having both observers count every day than in the previous three years. A considerable amount of observer bias data has already been collected at Round Island, and it is currently being analyzed. Instead, two pilot studies which were tested in 2001 were expanded in 2002. A single IKONOS satellite image of Round Island taken on June 16, 2001 was used to assess the possible usefulness of satellite images in counting walruses at remote sites. Land-based counts were used to ground truth the computer counts done by Doug Burn (USFWS) in the Anchorage office based on a computer assessment of area covered with walruses in this image. In 2002, this project was expanded and attempts were made to collect

five satellite images of Round Island using an ERDOS satellite. The satellite attempted to capture an image of Round Island whenever it passed overhead in the correct position, which was approximately every three to five days. However, useful images were only acquired on cloudless days, very rare in Bristol Bay. On "satellite days" both staff observers counted all of the beaches together, and a digital camera was used to photograph every beach. On "non-satellite days," only one staff observer counted walrus, while the other staff person focused on other tasks. Also in 2001, a small Olympus digital camera was used in conjunction with a simple laser printer to test the feasibility of counting walrus from photos taken from oblique angles at the various overlooks. Since the initial tests seemed promising, we purchased a Canon EOS D30 digital camera system with multiple lenses and higher resolution to further test this methodology in 2002. We also field-tested a new methodology using a grid system to count a portion of the walrus on a given beach and then extrapolate to the whole. Since we wished to continue to collect data on possible effects of time of day and time of tidal stage on walrus haulout patterns without continuing the three counts per day schedule, we instituted a randomized schedule for count start times. Over each three day period, we conducted one count beginning at 0900, one beginning at 1400 and one beginning at 1750. We moved the start time for the evening count from 1900 to 1750 in order to be able to maintain the pattern of counting west main beach after the other nine east side beaches, without hiking along the cliff face after dark. We also randomized the pilot study schedules such that in every three days, one ground count was paired with a grid count, one was paired with a photo count and one was a ground count only. The exceptions to the randomized schedule were satellite days. On all satellite days counts started at 1230 in order to be mid-way through the count, and preferably, in the process of counting main beach when the satellite passed overhead. In addition, all satellite days were photograph days as well. Count start times were also changed occasionally to accommodate other work that was occurring on the island, or visitor arrival/departure schedules.

Recorded sources of anthropogenic disturbance included boat traffic, unauthorized overflights by small aircraft, land-based visitor disturbance, staff and visitor arrivals and departures. We made every effort to minimize walrus disturbance by staff and visitors. When disturbances did occur, the following information was recorded: date, time, location, number of walrus on the beach where the disturbance occurred, number of walrus affected by the disturbance, behavior of the animals disturbed, the amount of time that passed before the walrus returned to their prior state, and the source of disturbance (if identified). Disturbance of walrus on the haul out was defined as any event that caused walrus to raise their heads, change their physical location or orientation on the beach, or to leave the beach (Hessing and Sheffield 1989, Kruse 1997).

Seabird Population and Productivity

We collected seabird population and productivity data for common murre (*Uria aalge*), black-legged kittiwakes (*Rissa tridactyla*) and pelagic cormorants (*Phalacrocorax pelagicus*) following protocols (Kettle, et al, 1997; Hatch and Hatch, 1981) used by the TNWR and by the Alaska Maritime National Wildlife Refuge (AMNWR.) Five population plots containing common murre, black-legged kittiwake and pelagic cormorants were delineated in 1997 (Rice 1997). In addition to the five plots used in 1997 and 1998 (Rice 1997, Stroka 1998,) a plot at first beach

containing a small pelagic cormorant colony was added in 1999. An additional pelagic cormorant colony plot at first prime beach was added in 2000. As neither of these pelagic cormorant colony sites were active in 2002, another small plot at second beach was added in 2002. Photos were used to identify the plots and painted stakes were pounded into the ground to mark the observation points. Methods were consistent among years. Observers counted the number of common murre, black-legged kittiwakes, black-legged kittiwake nests, pelagic cormorants and pelagic cormorant nests twice in each plot on 8 days between June 16 and July 1, 2002. Tufted puffins (*Fratercula cirrhata*) and horned puffins (*Fratercula corniculata*) were not recorded although some were present on all plots. In order to determine some measure of reproductive success, 25 black-legged kittiwake nests on one plot and 26 black-legged kittiwake nests on another plot, 25 pair of common murre on each of two plots, and 12 pelagic cormorant nests on one plot were monitored until we left the island on August 12. Productivity plots were checked for status upon our arrival and pelagic cormorant plots were already active. Cormorant data was collected from May 4 through August 11. The first population counts were started on June 16. Black-legged kittiwake nests, and murre pairs were checked every two or three days from May 24 until August 11. A telescope or 10 x 42 binoculars were used to determine nest contents and presence and behavior of adult birds.

Other Projects

A small Steller sea lion (*Eumetopias jubatus*) haul out located at East Cape was monitored every six days using the same methodology as walrus counts. Beach-found ivory was collected from the beaches whenever it was possible to do so without disturbing any walrus. All ivory was sold by the Eskimo Walrus Commission (EWC) in conjunction with the FWS and ADF&G during the Alaska Federation of Natives Convention in Anchorage, or at Beaver Round Up in Dillingham. The proceeds were deposited in the Ivory Fund which will help finance future walrus research. When collecting ivory from beach cast carcasses, we also collected a tooth for aging and, when the ventral side was accessible, the baculum. The bacula were sent to Professor Stephen De Stephano, of the University of Massachusetts in Amherst, for a study on breaking strength. Steve Rice continued his research on raven behavior and predation on cliff-nesting seabirds. Fox dens were monitored informally and the presence and number of kits noted. Unusual sightings, first sightings of the season of bird and plant species and anything else of interest were recorded in a daily log book.

Results and discussion

Technicians Mary Cody (USFWS) and Steve Rice (ADF&G) arrived on Round Island on May 13, 2002. Problems scheduling a boat to haul our gear from Dillingham to Round Island kept us out of the field longer than originally anticipated. Additional staff from the Biological Resources Division of USGS and from USFWS arrived on May 29 to conduct pilot projects on gathering DNA samples using a crossbow and dart system and attaching transmitters using a crossbow and dart system. The work was successfully completed and they departed on June 11. Joe Meehan (ADF&G) replaced Steve Rice on the island from July 2 through July 11. BBNA interns April Alexei of Togiak and Tim Dyasuk of Dillingham arrived on the island on July 7 and departed on

August 3. Steve and I left Round Island for Dillingham on the morning of August 12, 2002 aboard the 'Inconnu.' For information on trail improvement, the raven predation study and the visitor program, see Rice, 2002.

Walrus Monitoring

We counted all east side walrus haulout beaches on 90 consecutive days from May 14 through August 11. All counts by all observers were averaged to determine the number of walruses using the haulout on a daily basis. Walrus counts for all east side beaches combined ranged from a high of 2895 walruses on May 14 to a low of zero walrus on June 9, with an overall mean of 829 walruses. We counted west main beach on 75 consecutive days from May 26 through August 10. Counts of the west side beach (west main beach) ranged from a low of zero on 16 days to a high of 1059 walruses on May 28. The mean count on the west side from May 26 to August 10 was 246 walruses (Figure 3.) The daily mean of East and West side beaches combined was 1031 walruses. For a complete list by date of total island counts, see Appendix B.

Walrus numbers tend to build gradually and then to drop off sharply over cycles of about two weeks duration. Within this pattern, average walrus numbers remained fairly consistent throughout May, June and July, but were starting to drop off when we left in mid-August. This pattern was consistent between 2001 and 2002 (Table 1.) However, in 2001, peak numbers of the two week cycles built throughout the summer before dropping off in late July. In 2002, peak numbers of the two week cycles were highest when we arrived in May and dropped throughout the rest of the summer. For purposes of this report, the means of all counts by all observers were used to determine a daily walrus count (Figure 4.)

This year, we significantly increased efforts to develop a protocol for using photographic images to count each beach on Round Island. We photographed each beach with walrus present on thirty days throughout the season. We used a Canon EOS-D30 camera with a variety of lenses (17mm through 400mm) and both 1.4 and 2.0 extenders depending upon the beach and where on the beach walrus were located. We initially took photos from a variety of locations at each beach and using a variety of lenses. Once we had established the best combination, we took photos from a standard spot or spots at each beach using the best lens combination for capturing where on the beach the walruses were on that day. We entered the number of photos taken and at what focal length alongside each count in the data book. On days that coincided with a satellite photo, we photographed the entire length of each beach whether or not walruses were present. On other days, we simply photographed all walruses on the beach, but did not photograph beaches where no walruses were hauled out. Once the spots offering the best visibility and resolution for photos had been established, photos were taken from the same spots at each beach on each day. Photos were downloaded onto a laptop in the field and individual photos were made into a single composite photo using a standard PhotoStitch program. We attempted to create composite photos of the entire beach wherever possible, so that fewer individual photos needed to be counted later on. This also made data storage and labeling easier. However, depending on where on the beach the walruses had hauled out, it was sometimes necessary to use several individual photos or composite photos for each beach. We tried to use as few photos per beach as possible.

We edited and improved visibility and lighting in the photos as necessary using Adobe Photoshop. We then imported the digital photos into an Arcview GIS program. Each observer counted the number of walrus in each photograph on three separate overlays by placing a brightly colored dot on each walrus as it was counted, this may help to reduce undercounting or double-counting (Figure 5.) We then used the program to tally the number of dots (walrus) per photo/beach. While it takes a great deal more time to count from the photos, rather than on the ground, initial trials have left us hopeful that this method may significantly reduce observer variation, and allow a permanent record for comparison with future years. We have purchased a higher resolution camera for use in 2003, and we will continue to refine this process in 2003.

We also experimented with using a grid system to count walrus as another possible option for reducing variability and improving counts. We considered several methods for designing a grid that would be both portable and useful at a variety of beaches. We tried using a sheet of ½" clear plexiglass, with black electrical tape or a permanent marker used to make the grid on the plexiglass. We also looked at 2" x 2" slats of wood made into a grid. Neither method seemed portable enough nor stable enough to be used at the haulout beaches in the winds that we typically encounter at Round Island. We were able to use a standard sized plastic grid (designed as part of a shelving unit) to create a grid by using black duct tape to mark off some squares on the grid (in order to create grids of various sized squares.) We expected that we would need different sized squares in the grid at different beaches depending upon the distance from observer to walrus. This distance varies at Round Island from a few meters, to a hundred meters, to more than a kilometer. We attached the grid to a tripod using a nut and wood glued to the bottom of the grid system. This grid proved to be portable and durable, but was still not stable enough to use on a typically windy day. It was also difficult to position a grid at exactly the same spot and angle between days. Count variability did not seem to be improved by this method and we abandoned it before the end of the season (Figure 6.)

We recorded 45 walrus disturbance events in 2002 (Table 2.) A walrus disturbance event is defined as any action or event which causes a visible reaction in one or more walrus on a haulout beach. These fall into three general categories. The categories, in increasing levels of severity, are head raises, reorienting their bodies toward the water, and dispersal. Dispersal includes moving one body length or more toward the water as well as actually dispersing from the beach. We recorded 28 occasions when the disturbance could be attributed to a boat, seven occasions when the disturbance could be attributed to a plane and eight occasions when the disturbance could be attributed to staff or visitors on foot. We were able to identify six of the seven planes which illegally flew over the walrus on the haulout and caused a disturbance. The high resolution digital camera allowed us to capture the N-numbers of the planes on paper, as well as with eye-witness reports. All six pilots were ticketed by USFWS agents in the field. The USFWS agents responded quickly to each disturbance report. We also recorded eight occasions when boat and foot traffic caused no visible signs of disturbance when walrus were present. On one occasion no specific anthropogenic cause of the disturbance could be determined, however rock fall or seabirds flushing may have initiated the walrus response and dispersal. An additional 12 potential disturbance events were recorded where staff were unable to observe the walrus and so

could not determine whether a disturbance had occurred or not. See Appendix C for a complete list of all recorded potential disturbance events. In response to the high levels of overflights occurring this summer, we made every effort to increase public awareness of the regulations of the sanctuary and the dangers of harassment to the walrus. ADF&G and TNWR staff issued public service announcements regarding walrus disturbance on the radio and in both local Dillingham (The Bristol Bay Times) and Anchorage (The Anchorage Daily News) newspapers. Channel Two news also did a story on the disturbances and asked people to visit the sanctuary "the right way." The interns reported on the walrus disturbances to their villages and before the Qayassiq Walrus Commission.

Satellite images of Round Island were successfully taken on four days, (May 17, June 17, July 10 and July 28.) An additional 13 attempts were made on days where the weather was too overcast to successfully capture the image. Ground counts and photo counts will be analyzed in conjunction with counts based upon the satellite images by Doug Burn of MMM.

Seabird Population and Productivity

We began seabird population counts on June 16 and completed the eighth count on July 1 (Table 3). We counted all plots in the same day, and counted every other day, unless weather or plot disturbance by ravens or other predators prevented counting. In 2001, the average numbers of each species on all plots decreased by 46% to 67% from 2000. In 2002, murre and kittiwake numbers remained about the same or increased slightly (~10%) on all plots from 2001. Pelagic cormorants did not nest on previously used plots, and we were not able to locate new plots early enough in the season for population monitoring. Pelagic cormorants were already on eggs when we first checked nests on May 17. We observed the first black-legged kittiwake egg on May 24 and the first common murre egg on May 31.

All five plots are located at the edge of the main colony and may not reflect success or failure rates that occur in the center of the colony. The plots are located near the main beach overlook area and may be negatively affected by the daily human activity at the observation point. Plots at main beach are between two and 100 meters from the cliff edge platform where visitors and staff commonly sit. It has been estimated that over 220,000 seabirds nest annually on Round Island (Haggbloom 1994). However, most are located along cliffs that are not observable from land. Due to frequent high seas and poor weather, it is not possible to regularly monitor any sites by boat.

Murre, kittiwakes and pelagic cormorants fledged 4%, 34% and 70% of the eggs laid respectively (Table 4). Some murre, kittiwake and cormorant chicks remained on the plots on August 12. Following APEX protocols (Kettle *et al*, 1997,) we assumed that murre chicks fledged successfully if the murre chicks were 15 days old or older when we left the island. Therefore, we assumed that the two murre chicks aged 16 and 18 days old fledged after we left the island. Predation rates are very high on Round Island, however, we did observe several murre fledglings on the water before we left. We assumed that five murre chicks aged 11, 9, 6, 3, and 9 days old respectively when we left, and four murre eggs did not fledge. We assumed that three kittiwake

chicks aged 30 days or older when we left the island were successfully fledged, in addition to 23 that had fledged before we left and were returning to the nest off and on during the day to feed. There were no younger kittiwake chicks nor were there any unhatched kittiwake eggs.

The twelve accessible pelagic cormorant nests that we were able to follow successfully fledged 35 out of 45 chicks. All of the remaining pelagic cormorant chicks had fledged and were leaving the nest regularly, returning to it in the evening and to be fed by the time we last checked productivity plots on August 11. Chicks of all three species were commonly lost due to storms. Murre and kittiwake chicks were commonly lost due to predation as well. Although a few cormorants visited the First Beach colony early in the season, none built nests there. The First Prime pelagic cormorant colony had fewer nests and much lower attendance than in 2001. The colony appeared to be wiped out by a storm shortly after we arrived, and no attempts were made by any of the pairs to rebuild. We were able to find a viewpoint to gather some data on nests at Second Beach, however, we never felt that we could see into the nests well enough to gather accurate data on the number of eggs laid. We will continue to look for new pelagic cormorant plot sites in 2003.

Ravens (*Corvus corax*) and foxes (*Vulpes vulpes*) were commonly seen predators again in 2002. Ravens preyed upon adult murre and kittiwakes, on murre and kittiwake chicks, and on the eggs of all three monitored seabird species, in addition to voles. Foxes took adults, chicks and eggs of all three species, but were limited to the lower and more accessible cliff areas. Foxes were frequently seen taking parakeet auklets, pigeon guillemots, horned and tufted puffins. Ravens were frequently seen hunting and harassing murre and kittiwakes at all main beach plots. Ravens often flew by each cormorant plot and were observed taking unattended eggs, but were not observed hunting or harassing cormorants. We also observed peregrine falcons (*Falco peregrinus*), rough-legged hawks (*Buteo lagopus*) and bald eagles (*Haliaeetus leucocephalus*) hunting at the seabird cliffs.

Other Projects

Two college interns from the Bristol Bay Native Association, April Alexei and Tim Dyasuk, joined us on the island for a month from early July to early August. They eagerly participated in all aspects of the research and camp chores, and they were a great help with data collection, data entry and field-checking. We hope that we will be able to continue and perhaps expand this program in the future. For more information on the internship program, see the interns' reports in Appendix D.

From May 14 to August 6, an average of 120 Steller sea lions were counted on land at the East Cape haulout (Table 5). Monthly averages were 282 in May, 45 in June, 63 in July and 90 in the first half of August. We counted sea lions in the afternoon or evening, usually from a land-based observation point. Sea lions also hauled out below cliffs near East Cape where they were not visible from onshore observation points. We were unable to find a safe vantage point and do not know how many additional sea lions were under the cliff edge. On June 15 we were able to

count from a skiff approximately 200 meters from the beach. Both tagged and branded sea lions were regularly observed on the haulout in 2002. Observers at the east cape haulout are usually land based and within 100 meters of the walrus, so brands are often easily visible, while tags are difficult to identify, particularly when the color has become faded. No attempts were made to photograph branded and tagged sea lions in 2002, however, we will do so in 2003.

Only two fox dens were known to be active on Round Island this season. The den at East Cape produced at least two kits. One den on the hillside behind the cabin produced three kits. A pair of foxes were frequently seen in the west main beach area, however no kits were observed in this area and the old den site in this area did not appear to be active.

A pair of rough-legged hawks (*Buteo lagopus*) were occasionally seen by campers and staff in the main beach area and along traverse trail, but did not appear to be nesting this year. A pair of bald eagles and a pair of peregrines were nesting in an inaccessible area on the southwest part of the island. For the third season, we again saw a short-eared owl (*Asio flammeus*) off and on throughout the early part of the summer.

Recommendations

1. Collect cloud ceiling data. Cloud ceiling is thought to affect seabird colony attendance (Lisa Haggblom, pers. comm). Consider recording wind speed and direction at several beaches, since it varies considerably throughout a single count and onshore winds seem to affect walrus beach use. To maintain consistency, continue to record wind speed and direction at the cabin. In order to collect a more accurate representation, also record wind speed and direction at SP and MB.
2. Continue using a telescope and digital camera to develop new protocols that will lead to more accurate counts with less variation between observers. These options seem to offer the best current technology that may greatly reduce observer bias and variation.
3. Continue and possibly expand the internship program as more students are found who wish to be involved at Round Island. This program has many benefits to the local communities, the students and the staff of Round Island.
4. Contract with a local fishing boat early in the year to transport field gear from Dillingham to Round Island in order to facilitate an earlier arrival in the spring. In previous years, we have used the law enforcement boat when it is available. However, this has meant a delay of as much as two weeks in Dillingham. The cost of the charter would be offset by the money saved from paying the lost work time and staff per diem while in Dillingham.
5. Currently, count quality reflects the observer's gut feeling before looking at the tally meters. It might also be useful to record how accurate the observer thinks the count is after looking at the number on the tally meter.

6. Start/end times don't accurately reflect time spent counting since each start time has to be recorded as a different time due to data base constraints. When there are few walrus on a beach, an observer may complete three counts in one to two minutes, but has to record the times differently. Also on some beaches, observers count from more than one spot (travel time). I'd recommend changing the data base to reflect this reality of data collection. Removing 'start time' as a key field and substituting a numerical or alphabetical field to track the number of daily counts at each beach would suffice. This additional column could be an auto-fill column that would not add to data entry.

8. Try to get some volunteers to come out and do a major one time trail-fixing party. Some areas of the trail are very rutted from years of use in muddy conditions and water run off. During wetter periods, the trails are several inches deep in mud and standing water. Building board walk in many areas seems like the best way to preserve the trails and also makes it obvious to visitors where the trails are (sometimes difficult to discern when the grass is high).

9. Install a water gauge to measure tide height, possibly in boat cove. This would provide a more concrete measure of tide height than our estimates. Tidal flow seems to vary considerably in Bristol Bay due to river flow, wind speed, wind direction and duration and the tide charts don't seem to be very accurate.

10. Add low intensity seabird population plots near west main beach area. At these plots we would check only the number of common murre pairs, black-legged kittiwake and pelagic cormorant nests and individuals. We would also check on the number of chicks mid-way through the breeding season and again near the end. This would give us some idea if the productivity plots accurately represent the rest of the island.

11. Photograph any branded or tagged sea lions observed during routine counts of the sea lion haul out following protocols developed by the National Marine Fisheries Service (NMFS) and ADF&G in spring 2003. Possibly increase sea lion counts to every three days rather than every six days. Make more of an effort to count sea lions earlier in the day when attendance and visibility are better.

12. Continue using the digital camera and computer programs for photo enhancement to identify and prosecute low flying airplanes or boats which illegally harass the walrus, causing disturbances within the sanctuary. Continue prosecuting violators of the MMPA through USFWS law enforcement, while also working with all available sources to increase public awareness of the consequences of walrus harassment for the walrus and for themselves.

Acknowledgments

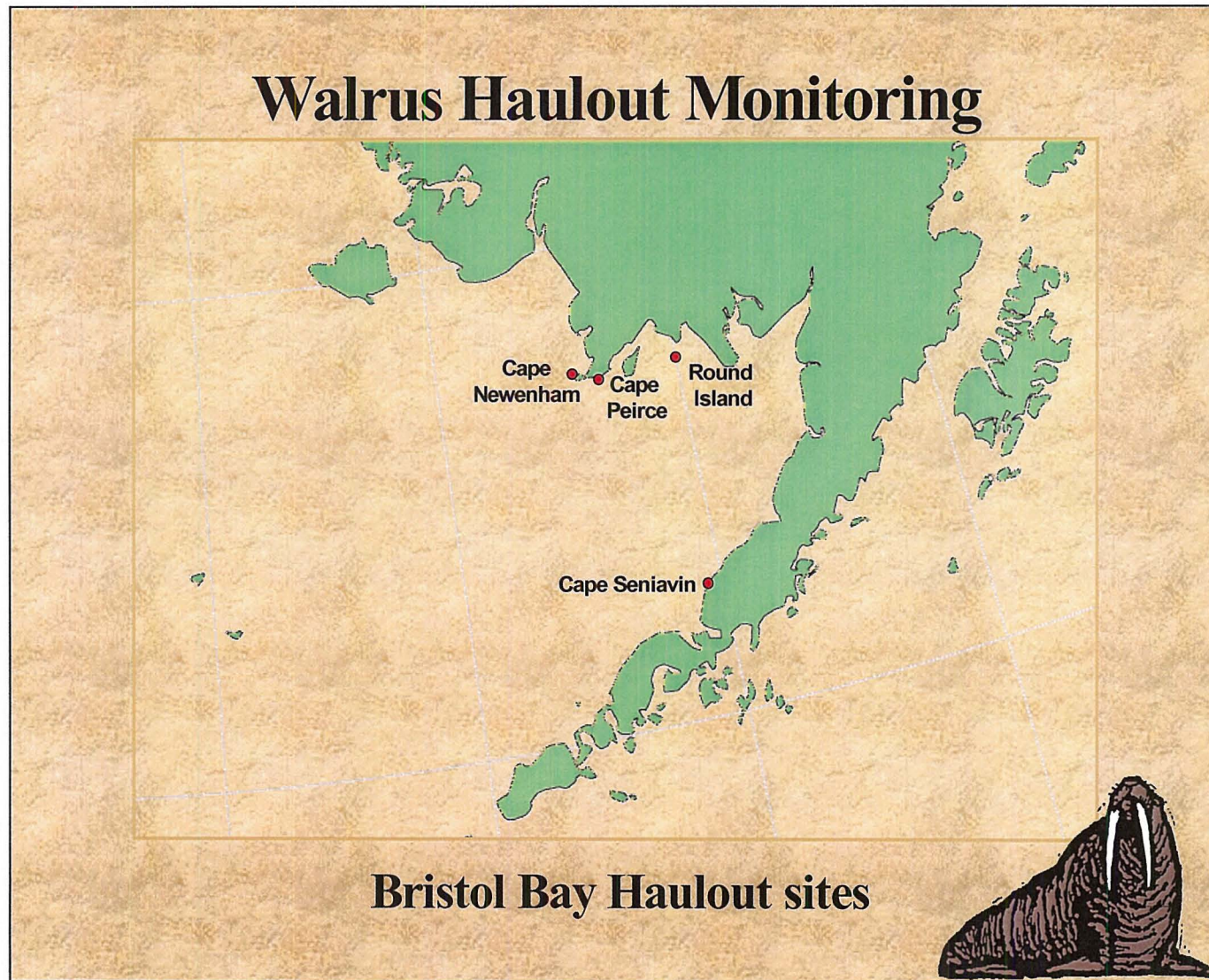
The Round Island field camp relies heavily on people back in the office to keep things running smoothly. In the Anchorage offices, Ellen Baier, Rosa Meehan, Joel Garlich-Miller, Wells Stephensen and Marc Webber (USFWS) and Joe Meehan (ADF&G) all helped with logistics and

managed the Anchorage end of things. Jim Woolington (ADF&G) and Eunice Dyasuk (ADF&G) provided daily field support, were our link with civilization and managed the sanctuary from Dillingham in spite of a daunting list of other duties. Terry Johnson (Johnson Maritime/Walrus Island Expeditions) brought us groceries, mail and visitors. Steve Rice is, as always, a pleasure to work with in and out of the field, his expertise and hard work will be greatly missed. April Alexei and Tim Dyasuk were a great addition to the field camp and will be sorely missed next year as well.

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Figure 1. Location of walrus haulouts in Bristol Bay, Alaska. Round Island is located within the Walrus Islands State Game Sanctuary. Capes Newenham and Peirce are located within the Togiak National Wildlife Refuge. Cape Seniavin is located on state land.



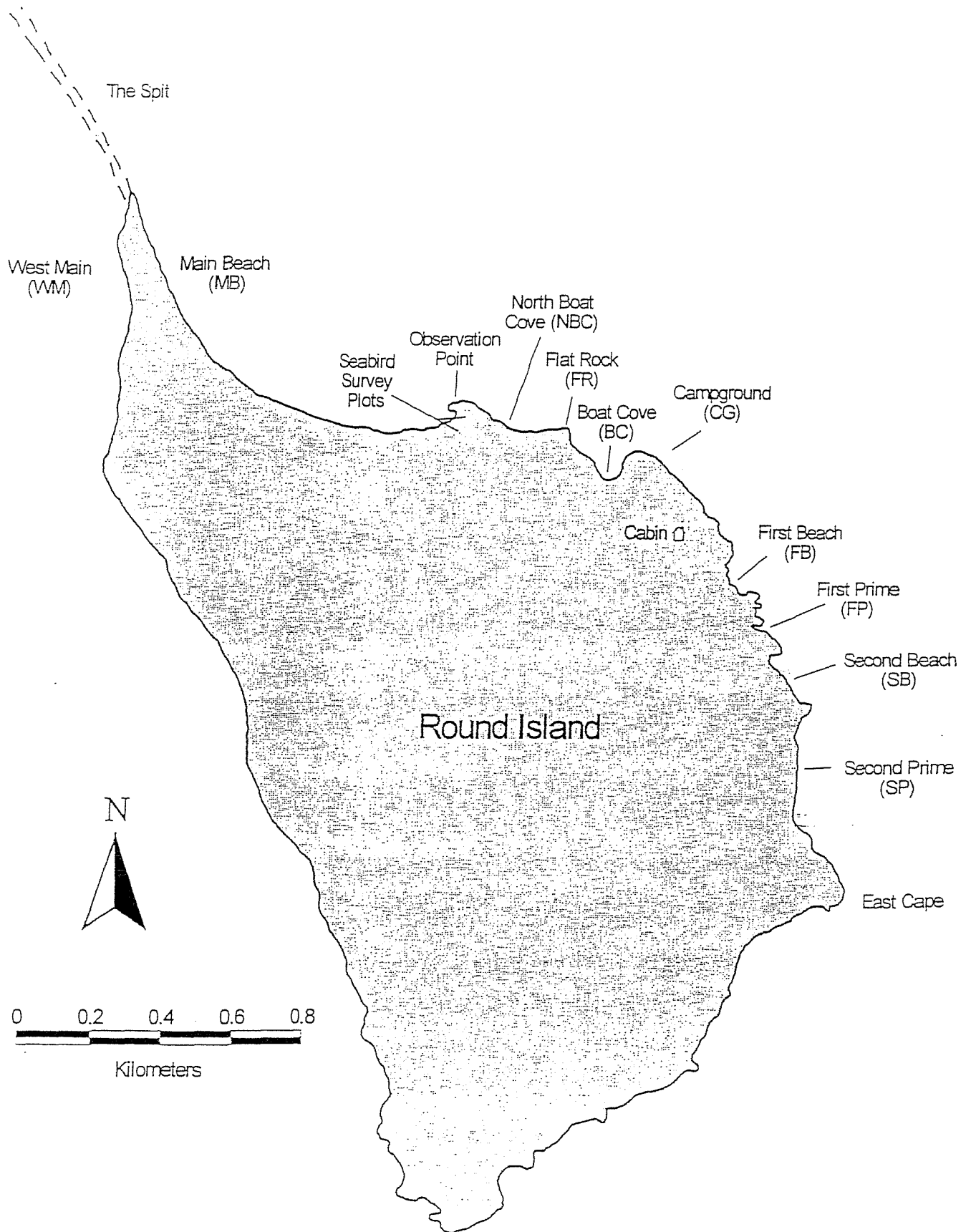


Figure 2. Area map of Round Island including landmarks and walrus haulout beaches.

Figure 3. Daily counts of walrus on Round Island during the summer of 2002. Counts ranged from a low of 111 on July 13 to a high of 3371 on May 29, 2002. Round Island is located in Bristol Bay, Alaska.

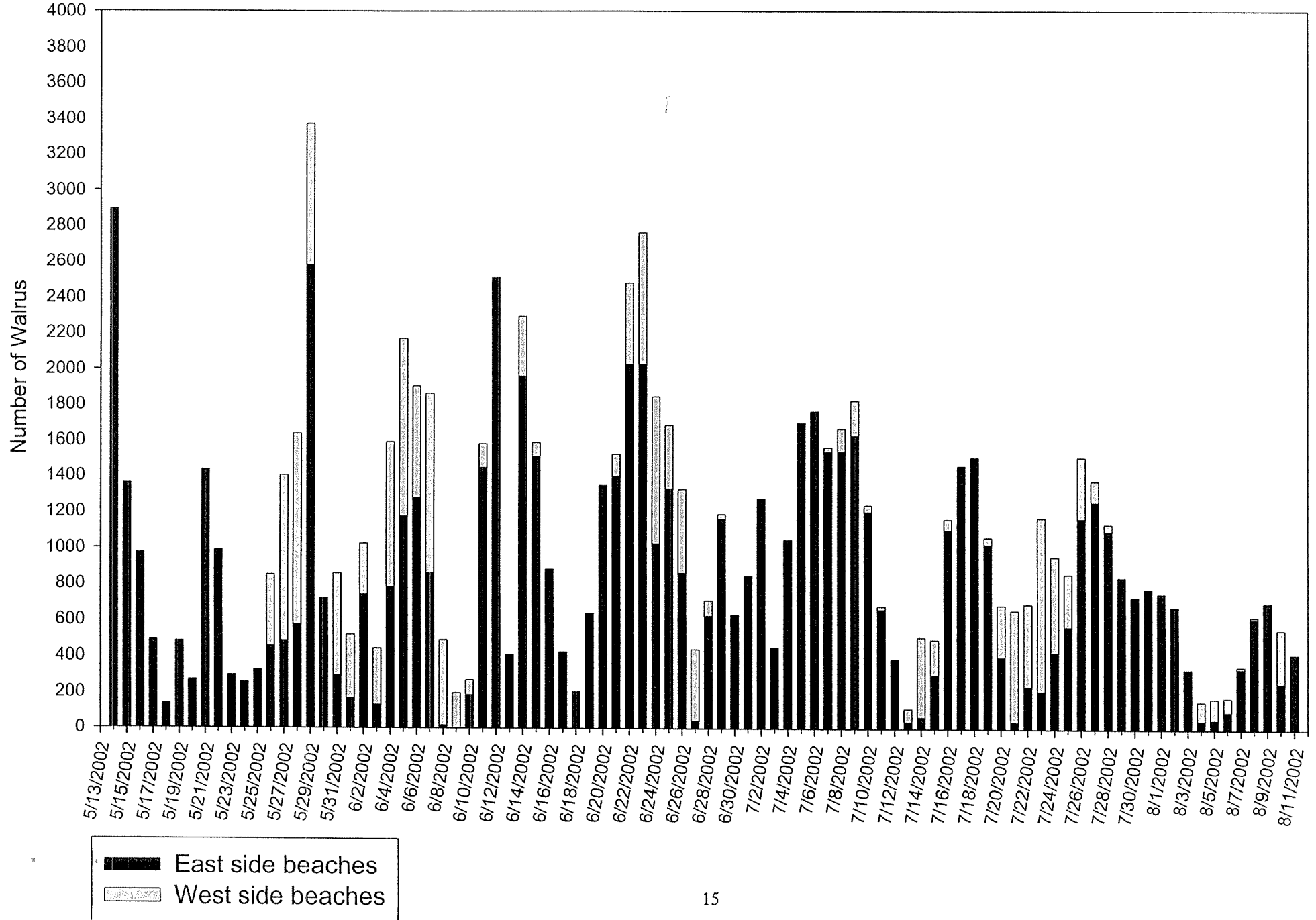


Figure 4. Daily counts of walrus on Round Island for the years 2001 and 2002. Round Island is located in Bristol Bay, Alaska. East and west side counts have been combined.

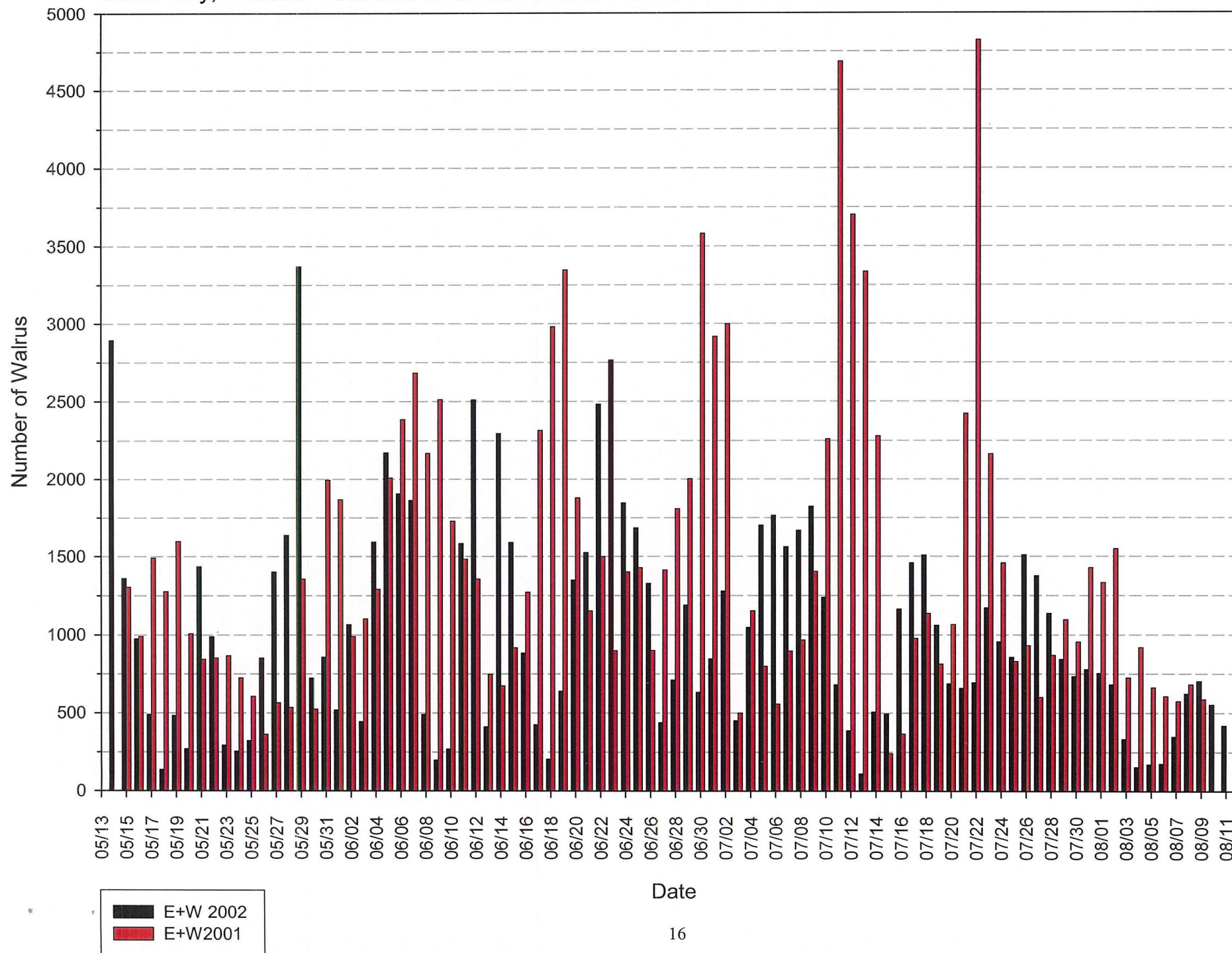


Figure 5. Walrus photo from second beach, located on Round Island, Alaska. This photo was taken on June 17, 2002 using a Canon EOS D30 digital camera. Similar photos were used for a pilot project using photo counts of walrus in comparison with counts done by multiple observers using 10x42 binoculars.



Figure 6. Grid system in place at first beach, located on Round Island, Alaska. This grid system was used to create a subset of walrus on the beach for counting purposes. This was the most successful of many formats tried, however attempts to use a grid for sub-sampling walrus were unsuccessful overall.



Table 1. Summary of daily walrus count information from the Round Island haulout, located in Bristol Bay, Alaska. The mean of all observers' counts have been combined for all beaches. Walrus were counted from May 14 through August 11, 2002.

Month	Range	Mean
May	137 - 2895	1041
June	198 - 2765	1234
July	111 - 1824	1037
August	154 - 753	447

Table 2. Summary of disturbance events on Round Island, located in Bristol Bay, Alaska. Observers were located on the island from May 12 through August 12, 2002.

Cause	Disturbance Observed	No Disturbance Observed	Unknown
Foot Traffic	8	0	0
Boat Traffic	28	7	10
Plane Traffic	7	0	1
Motorized Trail Maintenance	1	1	0
Helicopter/Boat (staff arrival)	0	0	1
Unknown Cause	1	0	0

Table 3. Seabird population summary for Round Island, Alaska, 2002. Mean of counts conducted at peak laying for each species, common murre (*Uria aalge*), black-legged kittiwakes (*Rissa tridactyla*) and their nests, and pelagic cormorants (*Phalacrocorax pelagicus*) and their nests.

Plot ID	MB-1	MB-2	MB-3	MB-4	MB-5	FB	FP
common murre	48	171	62	389	95	0	0
black-legged kittiwake	35	101	91	113	22	0	0
black-legged kittiwake nests	38	95	86	107	21	0	0
pelagic cormorant	0	0	0	0	0		
pelagic cormorant nests	0	0	0	0	0		

Table 4. Seabird productivity summary for Round Island, Alaska, 2002. For common murre (*Uria aalge*,) 50 pairs of adults were monitored on two plots. For black-legged kittiwakes (*Rissa tridactyla*,) 51 nests were monitored on two plots. For pelagic cormorants (*Phalacrocorax pelagicus*,) 12 nests were monitored on one plot, newly established this year. The cormorant nests were added after peak laying, and so I do not have good data on laying success or nesting success.

	common murre	black-legged kittiwake	pelagic cormorant
no. of nests/pairs	50	51	12
no. of eggs laid	53	77	50
no. of chicks hatched	11	45	45
no. of chicks fledged	2	26	35
laying success	0.68	0.78	N/A
hatching success	0.21	0.58	0.90
reproductive success	0.04	0.34	0.70
productivity	0.04	0.51	2.9
nesting success	N/A	0.51	N/A
brood reduction	N/A	1.00	0.58

Laying success: pairs/nest structures where 1+ egg is laid per total pairs/nest structures.

Hatching success: eggs that hatch per total eggs laid.

Reproductive success: chicks that fledge per total eggs laid.

Productivity: chicks fledged per pair/nest structure.

Nesting Success: nests where 1+ chicks fledge per total nest structures

Brood reduction: number of 2+ chick nests where brood reduction occurred per total nests with 2+ chicks.

Table 5. 2002 Steller sea lions at the East Cape haulout located on Round Island in the Walrus Islands State Game Sanctuary, Bristol Bay, Alaska. Steller sea lions were counted at least once per week, usually from land-based observation points, during the summer of 2002.

Month	Range	Mean
May	100 - 449	282
June	33 - 62	45
July	20 - 89	63
August	N/A	90
May - August	20 - 449	120

Appendix A. Walrus Counting Protocols

Bristol Bay Walrus Haulout Monitoring Program

1998-2001

Follow these protocols every day. If a situation arises and you cannot follow standard protocols, document (in detail) how and why you changed protocols in the comments section of the count data form. We are asking for an increase in observer effort so that we can collect information to answer some basic questions of haulout use and herd movement patterns. This information will help to refine the methodology for the Bristol Bay haulout index and monitoring program and will provide important information on widespread movement patterns (useful in understanding the dynamics of the Bristol Bay complex and will help in the design of the next range-wide population survey) .

1. Counting Methodology. Individually count walrus hauled out on each beach or estimate their numbers using binoculars, tally meter, pencil, and notebook. Count the number of walrus in the water (within 10m of shore) at each beach and record the number separately from the beach count.

Tally meters are notorious for short functional (accurate) lives, and quickly become great sources of variability and inaccuracy in counting. Every day or 2, check your tally meter by counting to 100-200 and checking what the tally reads, repeat this once or twice to determine if the tally is working properly. Replace the tally meter as soon as the it begins malfunctioning.

Counting technique will vary with group size counted. The following guidelines are suggested. In general, count individuals in groups of up to 200 animals. The maximum number of walrus that can be counted individually will vary with observer experience, beach location, survey conditions, etc. For example: on haulouts with distinctive landmarks such as boulders, larger numbers of walrus can be individually counted. To count these groups, divide the beach into sections, using landmarks as reference points. Count walrus in each section, and add these sections for a total count. Otherwise, in groups >200 individuals, estimate walrus numbers. To estimate numbers in larger groups, count the number of animals in a manageable, representative subsection of the group. Extrapolate that number over the remaining herd area.

All observers involved in walrus counting will count together each day.

Each observer will make 3 independent counts of each beach (groups ≥ 10 animals) and record these counts in their field book. If time permits, make 4 independent counts/beach. Each count is independent; the replicates will be used to identify sources and levels of variability in the count data. Do not discuss your counts with your partner until after counts are complete. Do not discard counts or change your counts after discussing them with other observers. If you are mid-way into a count and lose track or feel that the count is poor, start over.

Photograph one beach each survey day. Select a beach to start with and then photograph each beach (one each day) in sequence. Don't photograph herds comprising less than 10 animals. Record the roll identification and frame numbers in your field book and transfer this information to the comments section of the count data form. After the slides are processed, write the log-ID, beach, and start time on the slide frame with indelible marker. We will count a sample of these slides to identify individual bias and assess count accuracy of herds.

2. Daily Counts.

I. Round Island, Cape Peirce, Cape Seniavin: Start by recording the AM barometer reading at 0800. Begin counts at 14:00. Establish a routine where you count the beaches in the same order each day. Describe any changes to your normal routine in the comments section of the count data form.

II. Cape Newenham: Collect the AM barometer reading at 0800. Time your hikes to arrive at the haulout as close to 14:00 as possible.

3. Interval Counts (Round Island, Cape Peirce, Cape Seniavin). Every third day, observers will conduct repeated counts of each beach at prescribed intervals. Like the daily counts, these counts will be conducted independently, by both observers. Interval counts will occur simultaneously at monitored haulouts. (Because of the distance and time involved in covering Cape Newenham beaches, this haulout is exempt from interval counts). Once you begin a sequence of beaches counted, follow this same sequence for the duration of the field season. Collect the same environmental data as you do during routine daily counts.

Interval counts will begin at 0900, 1400, and 1900. Dates of interval counts are:

MAY: 3, 6, 9, 12, 15, 18, 21, 24, 27, 30

JUNE: 2, 5, 8, 11, 14, 17, 20, 23, 26, 29

JULY: 2, 5, 8, 11, 14, 17, 20, 23, 26, 29

AUG: 1, 4, 7, 10, 13, 16, 19, 22

Disregard any dates you are not in the field. Continue the pattern if you are in the field longer than the listed schedule. If there is a conflict between a scheduled interval count and another unavoidable activity (Round Island boat visit, etc), continue normal protocols (multiple observers, independent counts) to count as many of the intervals as possible. During periods of interruption, attempt to have one observer keep to the schedule to prevent interruptions of the intervals. Note any changes to standard protocols in the comments section of the count data form.

4. Main Beach Correlation (Round Island only). In order to determine the relationship between numbers of walrus hauled out on West Main beach and Main beach, observers on Round Island will include counting walrus at West Main as part of their daily counts once every 3 days. In order to count West Main beach, observers must walk Traverse Trail to the west end of the island. If trail or weather conditions prevent safe travel over this trail, delay beginning the counts until conditions are safe. If scheduling conflicts prevent observers from counting West Main, reschedule the correlation count for the day before the originally scheduled count (ie. if a correlation count is scheduled for July 4 and Winkleman is bringing visitors to the island during the counting period, reschedule the correlation count for July 3). This will take a little advance planning. If schedules or protocols are modified in any way, record how and why in the comments section of the count data form.

Dates of correlation counts are:

MAY: 5, 8, 11, 14, 17, 20, 23, 25, 28

JUNE: 1, 4, 7, 10, 13, 16, 19, 22, 25, 28

JULY: 1, 4, 7, 10, 13, 16, 19, 22, 25, 28, 31

AUG: 3, 6, 9, 12, 15

Appendix B. Daily walrus counts for Round Island located in Bristol Bay, Alaska. The log ID is a concatenation of Round Island (RI) and the year, month and date of the count. For example, RI020514 is the count for Round Island on May 14, 2002. All counts by all observers were averaged to get the mean.

Log ID	Sum of Average of Land Counts
RI020514	2894.66666666667
RI020515	1359.66666666667
RI020516	974.
RI020517	490.166666666667
RI020518	137.333333333333
RI020519	483.833333333333
RI020520	269.666666666667
RI020521	1435.
RI020522	989.166666666667
RI020523	293.833333333333
RI020524	255.333333333333
RI020525	322.666666666667
RI020526	851.333333333333
RI020527	1401.33333333333
RI020528	1637.33333333333
RI020529	3370.5
RI020530	722.166666666667
RI020531	857.666666666667
RI020601	518.666666666667
RI020602	1064.33333333333
RI020603	443.666666666667
RI020604	1592.75

Log ID	Sum of Average of Land Counts
RI020605	2171.
RI020606	1906.666666666667
RI020607	1864.
RI020608	490.333333333333
RI020609	198.166666666667
RI020610	269.
RI020611	1584.
RI020612	2511.09523809524
RI020613	411.333333333333
RI020614	2295.33333333333
RI020615	1590.5
RI020616	883.833333333333
RI020617	424.416666666667
RI020618	205.333333333333
RI020619	639.666666666667
RI020620	1349.66666666667
RI020621	1525.
RI020622	2482.5
RI020623	2765.
RI020624	1847.
RI020625	1685.41666666667
RI020626	1327.
RI020627	439.
RI020628	709.666666666667
RI020629	1189.25

Log ID	Sum of Average of Land Counts
RI020630	631.666666666667
RI020701	846.833333333333
RI020702	1277.08333333333
RI020703	451.333333333333
RI020704	1047.66666666667
RI020705	1701.58333333333
RI020706	1766.
RI020707	1562.66666666667
RI020708	1668.11111111111
RI020709	1824.66666666667
RI020710	1239.33333333333
RI020711	680.405555555556
RI020712	386.333333333333
RI020713	111.111111111111
RI020714	507.
RI020715	494.333333333333
RI020716	1163.66666666667
RI020717	1458.68253968254
RI020718	1509.
RI020719	1061.11111111111
RI020720	686.444444444444
RI020721	658.222222222222
RI020722	693.866666666667
RI020723	1171.55555555556
RI020724	955.555555555556

Log ID	Sum of Average of Land Counts
RI020725	857.555555555556
RI020726	1509.90598290598
RI020727	1376.77777777778
RI020728	1136.61111111111
RI020729	843.
RI020730	732.666666666667
RI020731	778.5
RI020801	753.333333333333
RI020802	681.413333333333
RI020803	333.333333333333
RI020804	154.
RI020805	171.666666666667
RI020806	175.5
RI020807	348.333333333333
RI020808	623.
RI020809	702.666666666667
RI020810	552.416666666667
RI020811	419.

Appendix C. 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, unless walrus were obviously disturbed by clear stimulus. Behavior of walrus in the water was not recorded.

Date	Approximate start time	Disturbance type	Closest approach to island	Elevation	Walrus response	Comments
5/13/02	2030	Staff transport via helicopter and boat.	Boat anchored about 100m offshore; helicopter lands on island.	0 m	Unknown.	Staff arrive via helicopter, and helicopter slings loads ashore from boat. No walrus in BC area, and walrus not observed elsewhere.
5/13/02	2230	Possible unauthorized visit by independent boat.	3.2-5 km	N/A	Unknown.	Boat may have been within the restricted area, but radio not working yet so unable to hail. Walrus not observed.
5/14/02	1000	Authorized visit by independent boat.	175 m	N/A	≥ 13 HR at FR.	Vessel lacked skiff, and crew unable to come ashore. Sit quietly at anchor for about four hours and then depart.
5/17/02	0130	Possible unauthorized visit by independent boat.	3.2-8 km	N/A	Unknown.	Boat may have been within the restricted area, but unable to judge distance in the dark. The boat was clearly audible. Walrus not observed.
5/22/02	1430	Possible unauthorized visit by airplane.	Unknown.	Probably >1650 m AGL	Unknown.	Airplane not seen but clearly audible. Walrus not observed.
5/24/02	0930	Unauthorized visit by airplane.	0 m	< 330 m AGL	>20 HR on MB1.	Airplane flies around island and then makes multiple passes along MB. Only walrus at tip of MB visible from cabin area, and additional disturbance possible on MB2-12. No walrus present on other

						beaches earlier in the day. USFWS-LE notified.
5/29/02	1413	Authorized visit by charter operator.	<150 m	N/A	≥18 HR, 2OR, and ≥5 DS from BC and FR.	Sea lion hauled out on FR also DS.
5/30/02	1655	Authorized research activity.	7 m	N/A	88 HR and 2 OR at S.	USGS researchers collect tissue samples from live walrus using crossbow and biopsy dart. Darted animals typically raised their heads briefly but then relaxed quickly.
5/31/02	1015	Authorized staff skiff operations and research activity.	15 m	N/A	>70 HR and DS from MB5.	Approaching skiff caused most of the disturbance. USGS researchers test crossbow tagging system on carcass. No walrus in BC area and minimal disturbance to animals on MB1-4.
6/1/02	1300	Authorized research activity.	10 m	N/A	7 HR, 1 OR, 1DS from S.	USGS researchers collect tissue samples from live walrus using crossbow and biopsy dart. Darted animals typically raised their heads briefly but then relaxed quickly. Video available through USFWS.
6/1/02	1500	Authorized research activity.	10 m	N/A	4 HR and 3DS from FB.	USGS researchers collect tissue samples from live walrus using crossbow and biopsy dart. Darted animals typically raised their heads briefly but then relaxed quickly.
6/2/02	1105	Authorized staff skiff operations and research activity.	3 m	N/A	86 HR, 1 OR, and 35 DS from MB4-5.	Walrus on FR not obviously disturbed by skiff operations, but 11 walrus DS from MB4 shortly after skiff beached. Intermittent DS over next six hours as USGS researchers collect tissue samples from live walrus using crossbow and biopsy dart. Another group of about 7 walrus DS after skiff leaves beach. Commercial jet also passed overhead during activity and may have contributed to disturbance.
6/3/02	1345	Authorized staff	10 m	N/A	9 HR, 3 OR, 4 DS at FR and	USGS researchers collect tissue samples

		skiff operations and research activity.			MB.	from live walrus using crossbow and biopsy dart. Darted animals typically raised their heads briefly but then relaxed quickly. Walrus <i>in water</i> also darted from skiff.
6/3/02	1545	Authorized visit by independent boat.	100 m	N/A	29 HR and 1 OR at FR.	Boat anchors at about 200 m, but skiff to within about 100 m.
6/4/02	1200	Authorized research activity.	2 m	N/A	35 HR, 5 OR, 10 DS from FB.	USGS researchers collect tissue samples from live walrus using crossbow and biopsy dart. Darted animals typically raised their heads briefly but then relaxed quickly.
6/5/02	1220	Authorized staff skiff operations and research activity.	10 m	N/A	1 HR/DS from S.	USGS researchers collect tissue samples from live walrus <i>in the water</i> using crossbow and biopsy dart.
6/5/02	1600	Authorized staff skiff operations and research activity.	10 m	N/A	No obvious response.	USGS researchers collect tissue samples from live walrus <i>in the water</i> using crossbow and biopsy dart.
6/6/02	1200	Authorized staff skiff operations and research activity.	2 m	N/A	6 HR, 4 OR, 2 DS at FR and MB.	USGS researchers collect tissue samples from live walrus using crossbow and biopsy dart. Narrative seems to indicate more disturbance than summary. Walrus <i>in water</i> also darted from skiff.
6/10/02	2028	Airplane outside restricted airspace.	0 m	>1650 m	150 HR and 8DS from MB1.	Airplane clearly audible. Virtually all walrus on MB1 HR and several minutes later 8 DS.
6/14/02	1343	Staff counting from CG OBP.	15 m	N/A	1 DS from waterline at CG.	
6/16/02	1415	Unauthorized visit by two airplanes.	<1 km	165 m	≥350 HR and 85-125 DS from MB1-2.	Two planes fly from cabin along MB and one does two to three loops along beach. USFWS-LE notified.
6/20/02	Unknown	Authorized staff skiff operations.	Unknown	N/A	20 HR/DS from MB.	Took skiff to MB to collect ivory from carcass >150 m from herd. Stopped after group began to disperse, though activity did not necessarily cause.
6/22/02	1423	Staff counting from	15 m	N/A	3 HR and 1DS from CG.	

		CG OBP.				
6/22/02	1609	Unknown.	Unknown	Unknown	400 HR, 50 OR, and 50 DS from MB3-5.	No obvious cause. Staff observed from about 1 km away, and no boats or planes visible.
6/24/02	Unknown	Authorized staff skiff operations.	100 m	N/A	5-10 HR at FR.	Took skiff to collect ivory from MB. Walrus on MB and WM not obviously disturbed. Walrus on FR appeared mildly disturbed as skiff left BC but not by return.
6/25/02	1600	Authorized staff skiff operations.	100 m	N/A	<20 HR and 5DS from FR and CG.	Took skiff to WM to count walrus. Walrus at FR HR as skiff leaves BC; no obvious disturbance at MB or WM; small group of walrus DS from FR and CG as skiff returns to BC.
6/30/02	1330	Authorized visit by charter operator.	200 m	N/A	27 HR and 1DS from FR and BC.	Intermittent HR as boat arrives and unloads; 1 DS as boat leaves BC.
7/2/02	0800	Authorized visit by charter operator.	N/A	N/A	Unknown.	No walrus in BC area; walrus not observed elsewhere.
7/4/02	1700	Authorized visit by charter operator.	>100 m	N/A	3 HR at FR.	Boat anchored at BC for about five hours and departure not monitored.
7/5/02	1030	Authorized visit by charter operator.	>100 m	N/A	No obvious disturbance.	Walrus present at FR, but not obviously disturbed.
7/6/02	Unknown	Authorized staff skiff operations and visit by charter operator.	Unknown	N/A	5 HR and 4DS at FR and SB.	Took skiff around island to count walrus; met charter boat at BC. Boat pulling anchor as skiff reached BC and combined activity apparently caused three of the DS.
7/7/02	1108	Staff counting at CG OBP.	15 m	N/A	1 HR/DS at CG.	Staff backed off as walrus started to move, but animal continued to DS.
7/7/02	1330	Authorized visit by charter operator.	>100 m	N/A	No obvious disturbance.	Not clear from notes whether walrus present in BC area and not monitored elsewhere, but notes report "no response at BC and CG".
7/11/02	1230	Authorized visit by charter operator.	>100 m	N/A	3 HR/DS from BC and FR.	DS during boat activity and as gear carried up cliff.
7/11/02	1415	Unauthorized visit by airplane.	0 m	200-265 m	>84 HR and >80 DS from MB, FR, and FB.	Airplane flew from cabin to MB and then doubled back along MB toward sea lion haulout. Several thousand murre also

						displaced. USFWS-LE notified.
7/11/02	1630	Unauthorized visit by two airplanes.	0 m	< 330 m	≥ 200 HR and ≥ 50 DS from MB1.	First plane circled island and made two passes along MB; second plane flies from cabin area to MB once. USFWS-LE notified.
7/11/02	Unknown	Authorized visit by charter operator.	Unknown	N/A	No obvious response.	Walrus on FR not obviously disturbed as boat powers up and leaves BC, but not monitored as boat arrived.
7/11/02	1852	Trail maintenance.	50 m	N/A	≥ 14 HR and 14 DS from FP.	Walrus apparently disturbed by noise of wooden stakes being hammered into ground along trail. Seem very skittish since airplane incidents.
7/12/02	0930	Authorized visit by charter operator.	150 m	N/A	4 DS from FR.	Captain reports 3 DS as boat drops anchor and 4 th DS as skiff returns to boat. Boat anchored until about 1800. Unknown disturbance during departure.
7/13/02	1915	Authorized staff skiff operations.	>100 m	N/A	4 HR, 1 OR, and 1 DS at BC and FR. Walrus at MB and WM not obviously disturbed though a few raised their heads as skiff passed.	Took skiff to WM to count.
7/14/02	2025	Authorized visit by charter operator.	150 m	N/A	3 HR and 3 DS from FR.	All on FR DS.
7/15/02	1130	Authorized visit by charter operator.	100 m	N/A	5HR and 1 DS from FR.	Walrus that DS had just hauled out.
7/15/02	1705	Authorized staff skiff operations.	200 m	N/A	No obvious disturbance.	No walrus in BC area; walrus at other beaches not obviously disturbed.
7/16/02	1050	Authorized visit by charter operator.	300 m	N/A	> 80 HR, 1 OR, and 3 DS from FR and CG.	All on CG DS. Boat not monitored during four-hour interval between arrival and departure.
7/16/02	1230	Trail maintenance.	>200 m	N/A	No obvious disturbance.	Using gas-powered weed cutter to trim trails. Walrus at FB and FR not obviously disturbed.
7/16/02	1610	Authorized visit by charter operator.	300 m	N/A	26 HR and 2 DS from FR.	Boat not monitored during four-hour interval between arrival and departure.
7/20/02	1745	Authorized visit by	Unknown	N/A	Unknown.	No walrus in BC area; walrus elsewhere

		charter operator.				not observed. Group of walrus gather in water 200 m from boat. Very low tide, so fortunate no walrus on top of FR.
7/24/02	1128	Authorized visit by charter operator.	150 m	N/A	25 HR at FR and BC.	Boat anchors 300 m out, but skiff approaches closer to walrus.
7/25/02	1250	Authorized visit by charter operator.	250 m	N/A	40 HR and 2 DS from FR.	
7/28/02	1136	Authorized visit by charter operator.	250 m	N/A	12 HR at FR.	
7/29/02	1410	Unauthorized visit by airplane.	<1 km	330-660 m	≥ 100 HF and ≥ 50 DS at MB and FR.	Plane made one quick pass along MB, but may have also flown over the island earlier in the day.
7/30/02	0833	Authorized visit by charter operator.	>100 m	N/A	≤ 35 HR and 1 DS at FR and BC.	
7/30/02	1324	Authorized staff skiff operations.	<100 m	N/A	15 HR, 1 OR, and 2 DS from FR and BC. No obvious disturbance at MB.	Took skiff to MB to collect ivory; beached >200 m from MB walrus.
7/31/02	1045	Authorized visit by charter operator.	250 m	N/A	No obvious disturbance.	
8/2/02	1625	Unauthorized visit by two airplanes.	100 m	3 m	400 HR and DS from MB.	Two planes fly over the tip of the island and circle MB; one drops to only about 3 m above the water as if preparing to land. USFWS-LE notified.
8/3/02	0735	Authorized visit by charter operator.	Unknown	N/A	Unknown.	No walrus in BC area; walrus not observed elsewhere.
8/3/02	1330	Authorized visit by charter operator.	Unknown	N/A	Unknown.	No walrus in BC area; walrus not observed elsewhere.
8/4/02	1445	Authorized visit by charter operator.	Unknown	N/A	Unknown.	No walrus in BC area; walrus not observed elsewhere.
8/5/02	1200	Authorized staff skiff operations.	>200 m	N/A	Not obviously disturbed.	Took skiff to MB to collect ivory. No walrus in BC area; walrus on MB not obviously disturbed.
8/6/02	1530	Authorized staff skiff operations.	200 m	N/A	2 HR on MB.	Took skiff to MB to investigate injured walrus (approached on foot to within 15 m).
8/7/02	0905	Authorized visit by	Unknown	N/A	Unknown.	No walrus in BC area; walrus not observed

		charter operator.				elsewhere.
8/7/02	0955	Staff counting at FB OBP.	40 m	N/A	10 HR and 9 DS from FB.	
8/8/02	1202	Authorized visit by charter operator.	400 m	N/A	Unknown.	Two walrus present on FR but not monitored.
8/11/02	0848	Authorized visit by charter operator.	200 m	N/A	40 HR and 1OR at FR.	Inconnu anchored for several hours but departure not monitored.
8/12/02	1935	Authorized visit by charter operator.	>100 m	N/A	Unknown.	≥4 walrus on FR but not monitored,

Appendix D. Reports from the Bristol Bay Native Association's interns, April Alexei and Tim Dyasuk, from their experiences on Round Island in 2002.

Round Island Internship Report

By: April Alexie

July 2002-August 2002

When I first heard about the Bristol Bay Summer Youth Stewardship Program Round Island Internship (BBSYSP Round Island Internship) program, I was stunned. I couldn't believe it. I didn't know they worked on Round Island, and that they counted walrus there. I got the information about the internship program when Bristol Bay Native Association (BBNA) went and visited the students at UAA (University of Alaska Anchorage) to see how the students that they funded were doing in school.

When Flossy Andersen called and asked if I was still interested in the Round Island internship, I said yes, and she sent me an application to fill out. The next thing I knew I was going to have an interview with Rose Fisher and Helen Chythlook. The next day Rose Fisher called and said I had been chosen for the Round Island Internship program, and that I had to fly over to Dillingham to get CPR training before I go to Round Island. The CPR class took place at the EMS trailer on June 21, 2002.

On July 6, 2002, I went to Dillingham, and on July 7, 2002, Tim Dyasuk (the other intern) and I made our way to Round Island. On that very same day we counted the sea birds with Mary Cody. On July 8, 2002, was the first time Tim and I counted the walrus. I don't know about Tim, but I caught on fast on counting the walrus. Mary said that

when other people count for the first time their counts are low. So, we were doing pretty well for our first day. Even though it would rain or shine we were out counting, but when it was too windy we wouldn't go on the long hike to West Main Beach. We counted sea birds, and their nests, every other day and checked if they had eggs and/or chicks. We counted the sea lions every three days, also.

When I first reached the island I wasn't expecting any cliff edges, and any other wildlife besides walrus and sea birds there. At first I was scared about the foxes, but I got used to them. The voles I couldn't stand them. I wasn't expecting the island to be mossy, and grassy.

To count the walrus we would get the time, date, log ID, location, the max and min temperatures, wind speed, wind direction, cloud cover, precipitation, tide-high, low, falling, or rising, and the barometer AM and barometer PM. We would have to get the barometer PM at 8:00 PM every day, and the temperature every day at 2:00 PM. The times we count would vary from 9:00 AM, 12:30 PM, 2:00 PM and 7:00 PM. The days would be different on how we would be able to count that day. Like for instants, one day would be a photo day, then a grid day, then a satellite day, and an optional day. The 12:30 counts would be satellite days if the weather were okay.

Satellite days are when the office in Anchorage would take pictures of the island with the satellite. Mary would also take pictures with the digital camera that Fish & Wildlife got for her to use on the island to take pictures of the beaches on the days that were a photo count and also on the satellite days. On the days of the photo counts, we would go back to the cabin and down load the pictures on the lab top and get the pictures set up to do the counts.

We worked on the grid also. Mary, Tim and I were trying to figure out how to use the grid to count the walrus. One day we left for the count early and tried out the grid but the grid was too heavy for the tripod. They had the grid sitting on the tripod and the wind kept blowing the grid down. We had fun trying to figure out how to use the grid to do the count.

When we counted the walrus we would get the all the beaches written down, the method of how we counted which was with the schedule time, the observer, the Beaufort Sea State, the beach condition, the beach used, and the visibility-if you can see the walrus clearly or not. At every beach we counted the walrus three times and have three different ending and starting times. We also counted the walrus that were in the water 10 meters from land. If

there were no walrus on a beach then we would count the beach once, even if there were walrus in the water.

After we were done counting, we would enter our data in the lab top we used. We would also enter the sea bird data. Entering the data in the computer was set up like how we wrote down the data collected counting the walrus.

When we got done with the count early in the day and we had nothing else to do we do chores around the cabin. Like for example painting the out houses and the cabin, burn trash, do the dishes; check if the siphon was working in the well, and what ever Mary or Steve needed help on.

I chose Biology because in high school when I took the class I became interested in how every living thing exists. I wanted to go toward the medical field when I first enrolled at UAA, but BBNA gave me an opportunity to experience working with animals instead of humans. I don't know what to with my future now because of my experience on Round Island.

While on the island, three film crews visited the island, and filmed us doing our job. The first one was the National Geographic people, and they were out there for a couple of days. Next was the French film crew. They actually had us acting out. They said that if they had more time they would have filmed us while doing our job,

but they needed it in like a couple of days because they had to go somewhere else too. I had fun with those guys. The last was the Channel 2 News. John Tracy interviewed all of us, Steve, Mary, Tim and me. The other film crews didn't interview Tim or me, only Steve and Mary. Tim and I meet Steven Rice a couple of days later because he went on his week long break off the island. Steve works with Fish & Game.

My experience on Round Island was great. I enjoyed it. It made me think again about going towards the medical field. I wasn't expecting to act. I didn't read anything on being filmed, and it wasn't in the job description. I would certainly encourage other young adults to visit/work on the island. It is a beautiful place.

2002 Round Island Internship Report

By Timothy A. Dyasuk, BBSYSP intern

Dillingham, Alaska

August 16, 2002

I first heard about this program through my mom, Eunice Dyasuk she is working at Fish and Game, and asked if I would be interested in applying for an internship on Round Island. Before this internship I have never really heard or seen much about Round Island and was very interested about this internship. I was very glad to hear that after I filled out the application and did the interview, that I had gotten the job.

A couple of week later I started work for B.B.N.A, with First Aid Training. The first aid training was done in Dillingham with a number of other BBNA workers; there is where I met the other person that also was accepted for the internship, April Alexie.

After I was certified in first aid, I had to get ready for the island. I look and gathered nearly all the things on the list and now I wished I had gotten a few things that were not on the list like about six more pairs of socks and a better pair of rain gear. The time was coming up fast and I still had to fill out the permit application to be allowed on the island. I didn't sleep much the night before we left to Round Island and forgot many of the things that were on the list, thankfully my mom, Eunice is the person the round island staff contacts everyday to update the fish and game on how they are doing and if they are in

need of anything. This is also how I first got to know some of the staff on Round Island before I got there. Marry and Steven both have had lunch with my mom and called the house over the weekend for some requests.

The plane was on time and the day before I had to pick up the food for April and I, and hurried to get the rest of the things that were on the list. I had asked my dad, Jon Dyasuk, for a tent but he had forgotten so I was in a rush to find one, and the one that I had found I had forgotten to stop by at his house to pick it up so it had to be sent on the next plane. When the plane landed on Nunavachak Bay, Terry Johnson met us and drove us to Round Island. The boat ride was about two hours and that day if I remember right it was pretty rough and a few people on the boat got a little seasick. It was about mid-day when we had finally arrived on Round Island and when we did, we were met by Marry Cody who was in their zodiac to pick us up.

After getting all the stuff to the island and unpacking we walked the island a little and turned in for the night, the next day we would start our counts. I woke up about 08:00 (the count are done using military time) and called my mom for the daily call in and asked for some stuff that I had forgotten, that day we started the count about 13:30 and saw a baby walrus witch was rare because Marry said that walrus stay with the mothers till they are about 2 to 3 years old and all the mother walrus are all near the ice caps up north and so that would either mean that the yearling would have to be separated for his or her mother or that the mother was there on the island. We did not see the mother that day

nor if I remember right the whole time that I was there, but we did happen to see another yearling who was I think a bit older but still too young to be on its own. The next day a film crew from National Geographic came out to do a Round Island special, I thought that was pretty cool. The crew didn't stay long and when they did leave another film crew from France came over and did a show on the satellite program on Round Island.

The satellite program is a satellite count of the island, I think this is pretty new and very hard to do because all Alaska's weather, and from the little that I do know of the program it has to be pretty clear for the satellite to even get a clear picture of the island. When they do get a good shot of the island though, you can almost count the walrus down to the one by one's, Steve is always telling us that he is going to moon the satellite on one of the picture days, I have yet to see him try hehe.

The French film crew only stayed on the island for about five days and in those five we had a blast with them, after a while we all were making jokes and doing different pranks on one another, like Steve and his pilot bread and little snails in Luke's bag, we all have fun with them and were sad to see them leave. Luke said he would send Marry a copy of the video and from what I had heard from Luke the show might be seen on the Discovery Channel in about a year or so.

Before Luke and Terry left we had seen about three different planes fly by the island. Law enforcement or L.E issues is a very serious thing on the island.

The fly-over's and beach disturbances can scare off hundreds of walrus and disturb thousands of bird colonies. The walrus have peripheral vision but strong muscles around the eyes; to see binocular but in their mad rush to get off the beach a lot are trampled. Bones and tusks are broken, eyes are damaged or lost and some die from the trauma of the stampede.

Another reason why the disturbances are taken so seriously is that the walrus will not come back if bothered too much. They spend weeks in the ocean feeding and when they come to the haul out it is for a much-needed rest and warming. If their rest is cut short they are under a lot of stress that causes health problems.

This year has had the most incidents of disturbances than in the past. I am not able to give details because there are on going investigations, but there have been disturbances by planes, boats and visitors to the island.

I have seen the effect on some of these disturbances first hand and know what the walrus can go through; it might be a neat thing to do a fly by of the island but most of the pilot don't even know how much damage they are doing to the environment and think that a quick look won't hurt much, but it does.

The rest of the time I was there went by so fast and when we were about to leave April and I asked Marry if we could stay longer. After going down the chain of command and getting ever one's ok we stayed an extra week and started on some of the other ways to count walrus. There are about three different ways to count the walrus on the Island. They are by the staff, satellite

and by digital photo. Some of the people work with Round Island are trying to come up with a way to count the walrus using a grid count; that is where you break the haul out space and count what is in the different boxes and do some kind of mathematics and it is suppose to give you the number of walrus on the haul out.

I am so glad that you all pick me for this BBNA internship, and don't even know where to begin on thanking you all. I have learned so much in the short time that I spent on Round Island, like the importance of not just preserving walrus haul outs but also the animals all over, like the different bird colonies and the foxes that crossed over the ice to get to the island, and so much more.
