

1989

1989 FIELD SEASON REPORT

ROUND ISLAND
WALRUS ISLANDS STATE GAME SANCTUARY

by

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1989 ROUND ISLAND REPORT

We began the 1989 Round Island season on 4 May by flying fixed-wing to Togiak from Dillingham and then helicoptering in 2 loads to the island with some of our gear. The boat followed us on 13 May when Ken Taylor brought it to us via the State Fish and Wildlife Protection Goose. We found the cabin in good shape and could see no signs of use of the island after camp was closed last season. There was less accumulated snow than in 1988 and location of trails, structures etc. was consequently simplified.

VISITATION

In calculating the amount of visitation the island receives, we counted both the day of arrival on the island and the day of the visitor's departure as visitor days. When a person visited the sanctuary more than once during the season, we did not count him or her as a new visitor but we continued to add visitor days to the total accordingly. We included United States Fish and Wildlife (USFWS) personnel in the visitor total because these people impact the island and its wildlife, although they are not permittees per se.

The early and brief herring season coupled with a series of gales gave us few visitors during May. However, the number of campers increased this year, 123 over last year's 91, and because of this we ended the season with 668 visitor days, compared with last year's 599 (See Appendix 1.). Approximately 20% of the campers were from outside the United States. The two Van Os tour groups accounted for 13% of our total number of island visitors and 18% of the campers.

In addition to the usual variety of visitors, we also had our share of media people. These included a team of Japanese photographers who were obtaining footage for a popular television wildlife series, a freelance group shooting footage (for a market which was not revealed to us but which was rumored to be the Ted Koppel show), and a KTUU news team from Anchorage which filmed a short series about the island and Don Winkelman. Several writers (including one with the Boston Globe working on an article for the spring travel issue) also visited the island, indicating that exposure of the island to the public will increase during the coming year.

Several negative incidents relating to permits occurred this year which we felt were remediable. Two Van Os tours were

booked back to back. As only 10 permits may be issued in advance, the first tour group received their 10 permits and then were able to pick up three more at a later date, apparently applying as individuals. One of these three was the tour leader. They also asked us to overlook the fact that the tour "cook" only had a permit good for one of the two weeks. In the second Van Os group, seven people were assigned permits in advance and two received permits at a later date AND for a different time period. The dates on these latter two permits were changed, although we do not know by whom. Unfortunately, these discrepancies came to light later, although it was immediately evident that the man who stayed for two weeks was not a cook. Also in retrospect, we realized that the two tour groups overlapped in the middle of one of their permit periods, which resulted in our exceeding our level of 15 campers per night several times.

Due to staff turnover in Dillingham there were one or two instances of more than 15 permits being assigned to campers for a given week. Also, in the past we have told campers that they may extend their stay if there is space available during the next period. However, we have no way at present of predicting which people with permits will actually arrive on the island.

We felt that communication between the Dillingham office and the island concerning visitors was very good this year. Although there were mix-ups with the permits we were usually forewarned about potential problems as well as potential problem visitors.

WILDLIFE AND RESEARCH

Walrus: To better standardize counts at Round Island for season-to-season comparisons as well as comparisons with Cape Peirce, we counted the beaches on the east side of the island each day ~~between~~ before noon. We did total island counts using the boat when weather and our other duties permitted and tried especially to use the boat when walrus numbers were high on the east side. The daily Main Beach counts were done from Observation Point, as they have been the last several years. The distance from the walrus being counted here may distort the count to some extent, but we felt if our counts were inaccurate that we were erring on the side of undercounting. On days when we took the boat around the island, we generally averaged our counts for the beaches and if there were a great discrepancy between our totals for a given beach, we would recount the beach.

Out of curiosity we counted walrus twice daily during two one-week periods, once at our standard morning time and once

on the afternoon's low tide to see whether there was a difference in number related to tide. It is possible that the weather during these two periods affected the walrus numbers at least as much as the tides.

Our daily counts have been summarized in Appendix 7. Note that the counts for all east side beaches are shown even on days when we also took the boat around the island. On these boat days, the west side beaches are tabulated and there are both a land- and boat-based count of the east side of the island as well as a boat count of the total island.

Our high count for walrus for the year was 7792, on 22 July. This is nearly twice as many as were counted on the high count in 1988. Also, use of the east side beaches seemed more consistent this year; walrus were using these beaches in May which they didn't in 1988 or 1987.

We did not find as many dead walrus on our arrival on the island as we did last year. We found one carcass on Main Beach which was evidently a landslide mortality. Late in the season a walrus was found wedged between rocks below the campground. It was not seen while alive, so whether it was disturbed into leaving or merely returning to the water on its own is unknown. Another mortality was found with a 7"-8" wound laterally on the neck. Other carcasses were too decomposed for us to determine their probable cause of death.

USFWS stationed a technician on the island for part of the summer to take acoustical measurements in order to assess potential noise-based disturbances. She arrived on the island after the end of the herring fishery and therefore was able to record very few fishery and mechanical noises. However, she obtained some good measurements of sound both in and out of the water. The technician was amenable to having other people listen to the deployed hydrophone when possible and this added a unique and informative dimension to the stay of some visitors.

We made several behavioral observations this season which are worth noting. In mid-June we noticed an increase in the number of younger walruses (<10 years of age) using the beaches compared to earlier in the season. Also, it seemed to Hessing that the number of these young animals was greater than that observed during the 1988 season.

Several interspecific interactions involving walruses were also observed. During May there were several times when one or more sea lions hauled out on Location 16 (Flat Rock), normally used exclusively by walrus. If walruses were present they reacted by blowing noisily and bobbing, and the sea lions sometimes would leave. We did not observe any

overt aggression but the sea lions did not use this site after early June.

We saw Orca whales in the area over the course of the season. They generally were more than a mile offshore, but one evening we saw a pod of four Orcas about 3/4 mile off Boat Cove and First Beach playing and/or pursuing a sea lion. The walruses in the area became extremely agitated. We saw a group of roughly 75 walruses swim toward the Orcas which by this time were moving east, about 1.5 miles from shore. The walruses were blowing noisily as they swam out. Three times the walruses turned suddenly and swam so rapidly back to shore that they actually pushed a wake before them.

None of the walruses which were radio-tagged during the last three years was observed this year. However, on 26 and 27 July "Pink Tusk" was observed hauled out on First Beach. He was marked by Taggart within the last ten years and was also observed last year. In August, Sheffield observed a three-tusked walrus on Second Prime beach. This walrus was only seen once.

Northern sea lions: We counted the sea lions at East Cape nearly each day (Appendix 8). We standardized our count location so that we stood atop the most southeastern point of land on the island. On the few occasions there were sea lions on the east side of this point we did not include them in our counts as the angle of incline makes it impossible to get an accurate count. For most of the summer the sea lions used Third Beach as a haul-out, unlike 1988 when they frequently hauled out on the rocky headlands just east of Third Beach.

No marked sea lions were seen this season. However, one sea lion with a net around its neck was seen on three different occasions. The net was digging into the animal's neck and the flesh was ulcerated and probably infected. As mentioned in the walrus narrative, a few times early in the season sea lions hauled out in areas used generally and nearly exclusively by walrus.

Cetaceans: The gray whale migration during May was more drawn out than what was observed in 1988. More whales were seen and more whale-whale and whale-sea lion interactions were noted. A cow and calf were seen in July, and in August a gray whale was seen off Main Beach.

On our first boat cruise around the island we found the carcass of a 35-40 foot female Minke whale on the southwest side of the island. Both baleen plates were separated from the whale. We took one back to Boat Cove where we kept it for visitors to see.

Orcas were seen from the island at least eight times this season. Several times we saw a pod of four--one male and at least two and possibly three females. At least some if not all of the other sightings were of this pod. We observed walrus reacting to the presence of Orcas, as mentioned in the walrus section of this report.

Birds: We observed kittiwakes and cormorants for productivity as was done last year and years previous. We monitored the northern cormorant plot established last year as well as the kittiwakes using this colony. We did not monitor the southern cormorant plot established in 1987 as this plot had only one nest on it, similar to last year. We also monitored two plots at Observation Point for kittiwake productivity. We did not monitor any of the plots as intensively as was done in 1988. The cormorants nested earlier than did the kittiwakes and had more nesting success, as shown in Appendix 6A. Although only one kittiwake had fledged by the time we left the island, we counted the remaining chicks as fledglings, as all were well-feathered and it appeared that fledging was imminent. Therefore, the productivity estimates for the Observation Point plots may be higher than what actually occurred. However, when compared to last year, the productivity rates were markedly lower.

Following generally the guidelines used by the USFWS in doing count plots for seabirds, we established two plots for counting murre and kittiwakes this year. We did not collect data on these plots regularly and we expect to modify the plots next year, but we felt it was worthwhile to attempt to sample the seabirds for gross changes in numbers.

As in other years, we kept a species arrival list which is shown in Appendix 6. Whether as a result of a stormy summer or for some other reason, we saw several species which, to our knowledge, had not been seen on the island before.

We found two ravens' nests which were both in bird colonies and readily viewed. The amount of observed predation on seabirds was much greater by ravens than by foxes or gulls. The ravens were on eggs when we arrived, and the hatching of these eggs was coincident with laying by kittiwakes and cormorants. The ravens were remarkably successful in bringing off their young, and by August we were observing groups of eight to fifteen ravens using the hillside behind the cabin.

Foxes: The number of fox sightings was down this year and we suspect that the cold winter was at least partly responsible. We saw few voles or shrews compared to other years and it was only by mid-July that we were seeing dead voles in the trail, whereas in 1988 we saw many dead shrews

and voles. The cabin den was again in use, and a maximum of five kits was seen associated with this den. After having to chase two photographers away from the entrance to this den we decided that the most practical policy was to declare the den off-limits within roughly 100 m. We told visitors of the den's existence and invited them to view the den from behind the cabin.

The East Cape and South Bench dens were again unused. Hessing found the Sea Lion den (not located last year) which probably had not been used since 1987. The West Plate den was not checked. Both the North Ridge and Pinnacle dens were in use during June but kits were not seen at either den. However, little effort was put into observing these dens. Judging from the few sightings of foxes over the course of the summer, especially relative to last year, a rough estimate of foxes who overwintered from 1988 to 1989 is 7-10.

DISTURBANCES

Wildlife: In estimating the amounts of disturbances to wildlife on Round Island, several variables need to be kept in mind. The disturbances to walruses which are logged during the season and which are summed up in Appendix 7A are those which we observe and are therefore heavily biased towards the lesser disturbances resulting from the arrival and departure of visitors. To date we have not had an effective method of assessing the more critical but less observed disturbances which might be so severe as to keep walruses from hauling out. In an attempt to standardize the scale of disturbance as well as the means of reporting, we have elaborated on the past method of reporting numbers disturbed and the severity of disturbance. The latter variable has been assigned a numerical value and defined as follows:

- Level 1: Walruses raise heads or move bodies, seen as a wave or ripple within a group of walrus
- Level 2: Walruses move towards water, usually stopping on beach or in intertidal zone
- Level 3: Walruses move directly into water, usually do not mill, and do not rehaul again for at least several hours

We took these numerical values and multiplied them by the number of walrus disturbed. This results in an index value which helps put the severity of the disturbance in perspective with the number of walrus disturbed. For example, if 20 walrus suffer a level 2 disturbance, that would result in an index value of 60 (20x3). If 5 are disturbed at a low level (level 1), that is an index of 5 (5x1). We have divided these indices into ratings of severity as follows:

INDEX	SEVERITY
0-100	low
101-1000	moderate
1000+	severe

Appendix 7A indicates that most of the disturbances affect a small number of the walrus using the island. It is also evident that this year most of the largest disturbances were caused by aircraft.

Because the USFWS technician had sonabuys deployed during several of the Puffin's arrivals, Don Winkelman was able to listen to the quality and distance travelled of the noise created by the Puffin. This resulted in a greatly heightened sensitivity on Don's part with respect to the Puffin's effect on animals on the east side of the island. In general, his approaches were slower and he attempted to anchor as far out of the cove as was practical.

The largest disturbance that we observed this year was when a Cessna 207 flew over Main Beach in August. Observers, including a commercial pilot, estimated the plane's elevation at 2000 feet. However, Ken Taylor reported the plane's elevation as 4200 feet; he was in the plane at the time, monitoring altitude, distance from the island, and resulting disturbance. Although that is well over the restricted distance, eight hundred walrus were disturbed. The fact is that although we have restrictions on approaching Round Island, we have little data available at present that will tell us how effective these restrictions are.

The yellowfin sole fishery was not in evidence this season, as it caught its quota of fish prior to our arrival. Hessing noticed this year that the time spent in enforcement activities was markedly less than last year. In-air noise was reduced, the number of walrus using the island was higher than last year and migrating gray whales lingered longer off the island than last year. We cannot tell whether these occurrences are merely coincidental.

We had two incidents of fishing boats "cruising the island." Both boats were within 1/2 mile of shore and both came past quite rapidly, heading southeast after paralleling part of the east side of the island. We pursued both vessels, which were out of Togiak, and asked the cooperation of the people on board in observing the restrictions of the Sanctuary. We were unable to assess the effects of these boats on walruses.

At its spring meeting the State Board of Game passed an amendment to the regulations concerning Round Island. This increased the restricted distance around the island from two miles to three miles. During a summer meeting of the North Pacific Fisheries Management Council (NPFMC) a proposal was passed which would restrict fishing for groundfish to waters outside a 12-mile radius of Round Island and the Twins. This proposal sunsets on 31 December, 1991. While we feel strongly that the "burden of proof" is upon the fishing industry to demonstrate that their activities in the vicinity of the Walrus Islands Sanctuary are not interfering with the use of the Sanctuary by walruses, it was apparent during the spring 1989 meeting of the North Pacific Fisheries Management Council that it will be incumbent upon us to show that the fishery is harming walruses or affecting their use of Round Island in order to gain an extension or increase in area of the proposed closure after that date.

Disturbances by humans on the island continue to be infrequent. We inform visitors upon their arrival about walrus behavior so that visitors will refrain from "crowding" walruses. However, it is difficult to constantly supervise a large number of people if these people wander at will on the island. Closer supervision will be necessary to further reduce visitor disturbances.

Another aspect of disturbance and one that remains infrequently addressed is seabird disturbance. Don Winkelman usually makes several trips a year to Black Rock and fishing boats approach and land on Black Rock, the Twins and the Sanctuary's other islands. Disturbance of the birds results in direct loss of eggs and chicks as well as predation by other birds on the exposed eggs and young.

Habitat: The contrast of last year's near-drought and this year's extreme rainfall was particularly noticeable on the trails. Several areas immediately above haulouts were denuded of vegetation by steady visitor use. Despite our warnings of rotten overhangs, people pressed their luck and "hung it out." We explained to each camper that stakes signify a closed trail and that by staying on the trails and steppingstones, habitat damage will be limited. However, visitors forgot our injunctions and we were frequently surprised at the places people chose to walk.

We made two new campsites this year. Serious attempts at rehabilitating the two main sites will be made next year, but if our camper numbers stay high this may not be a practical solution. By late August the trail into the campground was knee-deep mud. Gravel from the undercuts in Boat Cove was hauled to some of these places and the topsoil, thoroughly saturated with water, was removed from the trail at the worst wallows.

Although the topic of trail maintenance is an annual one, we continue to feel that the best course to follow is to maintain the existing trails rather than retire them and create new ones. Turn-around time for worn ruts on the island is considerable. Given the choice of working overtime (non-remunerated) and electing not to do trailwork, we opted for the latter and the trails probably suffered to some extent from this choice. However, with all the hours of extra work put into preventative maintenance on the trails last year, the worst problem areas last year were the worst ones this year as well.

IVORY

We did not collect as much ivory this year, primarily because either walruses were using the beaches on which we observed mortalities or because completion of other duties interfered. A list of ivory brought off the island this year is in Appendix 4. We kept a skull and mandible for display on the front porch. We feel that most visitors are interested in walruses before ivory and even for ivory hunters this may demystify the allure of restricted beaches and "free ivory."

MAINTENANCE

1. Trail system: Rocks and gravel were hauled to contribute to the ongoing attempt to stabilize the trails on the island. Areas primarily worked on included the trail into the campground, the "Sheffield Marsh" (just north of the campground creek), and the trails near First and Second Beaches. We added a few stones near the cabin but of course more would be better. We set stones leading to the hose which campers use for water. This trail, however, receives heavy use and its proximity to the creek is speeding the area's degradation.

2. Cable and boat: We installed two permanent bolts to better fix the ropes leading out of Boat Cove. We used an equalizing system on the cable to distribute the weight of the cable more equitably between the two good bolts. In addition, we installed a set of four bolts set in synthetic

rock which will anchor a plate to which the cable will be attached using a shackle. This system was not used this summer but is now in place should the older bolts shear as has happened in the past.

As it was last year, the boat was sticky on the upper tubes. Prior to the season's start, Hessing learned from a boat dealer that the Zodiac fabric "Strongan" is plastic and therefore subject to extreme and rapid degradation by the sun. Using solvents, we cleaned the boat twice over the course of the summer and coated it with a protective substance. However, it seemed most effective to cover the boat from the sun. This was not always practical but with a larger tarp next year it will save wear and tear on the boat. A rare combination of good weather and no visitors at the end of the seasons allowed us to glue some protective stripping along the keel of the boat and to cover some holes as well. Since the bottom of the boat is full of many small holes, we patched the worst ones and hoped for the best. We also added stripping to near the transom of the boat where extreme wear is evident, and we recaulked the screws holding the aluminum protective stripping onto the bottom of the transom.

3. Garden: The garden was virtually ignored this year except as a source of transplant material. The fence was moved, halving the effective size of the garden.

4. Water system: We installed a faucet downhill of the tub to simplify maintenance. Both the campground and cabin water supplies were tested and found to be "unfit for human consumption" because of the amount of coliform bacteria present in the water.

5. Construction: The roof of the cabin was re-tarred this year, which may buy the roofing another one or two years. A leak between the clerestory and the roof of the back room was mended with tar. The skylight and its associated fasteners were caulked. We built two more cook platforms, one of which is basically a stand for a Coleman stove. The camper outhouse was moved over its new hole in May. We dug it slightly down and it is now well protected from wind; we didn't push it over when we left at the end of the year.

6. We did not paint this year except for the hot tub platform. This was brushed and scraped and coated twice with floor hardener for lack of a better substance.

RECOMMENDATIONS

Visitors and access: We felt that we met the Puffin many times to the exclusion of our other duties. We calculated that Don came to the island two out of every three days. We are doubly concerned about this number of trips. Most

importantly, walruses frequently leave Flat Rock in Boat Cove during arrivals and departures of visitors. Although these aren't considered major disturbances, it behooves us to minimize them if possible. Secondly, meeting the Puffin requires a nebulous and often extensive time commitment from us, as described in the 1987 Final Report.

The two Van Os tours left us debating whether and how we might curtail abuse of the permit system. Ten years ago there would have been little problem but we expect to see use of Round Island grow as media coverage of it increases. We would do well to decide on a course of action now which hopefully will anticipate and take care of at least the largest problems.

Other instances of poorly regulated visitor use have to do more with poor communication than anything else. The following are some suggestions for changes we would like to consider and possibly implement before next season. By choosing carefully we can design a solution to our problems. The suggestions are not necessarily exclusive of each other and are as follows:

1. Decrease the number of campers to 8 (optimum boat load).
2. Decrease the permit period to 5 days (current average length of stay).
3. Grant Don a limited/exclusive use permit and restrict his trips to no more than three days per week.
4. Reduce the number of day visitors to 20.
5. If the number of overnight visitors remains at 15, clarify that it is 15 people PER WEEK. Any technical personnel not directly involved with administering the island should be included in the limit of 15.
6. Hold people to the time period shown in their permits, granting no extensions except in extenuating circumstances.
7. Tour groups granted permits must include the tour leader in the total number of permits requested. Tours should all have the company tour name on the permits. If we stay with a limit of 15 visitors per week, tour groups should be limited to 10 permittees.
8. Any irregularities in permit use may be grounds for revocation of the permit.
9. Only one person should be in charge of assigning permits. This will reduce duplication and confusion. We should keep a few blank permits on the island. This year we had several visitors, okayed through Dillingham, who arrived without permits and we have no records for these visitors.
10. Include a waiver on the permit if for no other reason than to forewarn people that visiting the island is not a walk in the park.
11. If possible, change radio schedule time to 0800-0900.

This is the time most people believe we stand by. There are a few times each season when Don comes out near 0930 and this would make our end of the schedule less hectic.

Disturbances: We believe we are doing a good job of minimizing disturbances on the island. However, there are a few more activities which might further decrease disturbance levels. People getting day permits should be reminded about the three mile limit. As has been done annually for the past several years, we should notify the herring and salmon fleets about regulations pertinent to the Sanctuary and inform them once again of the change in the restricted area from 2 to 3 miles. There are still a few boats which claim to know only about the 1/2 mile limit of years past. Finally, we need to continue to refine our calculations of extent of disturbance. It might be useful to collect behavioral observations in concert with acoustical data next season. Most of the disturbances we observe are related to visitor arrival and departure in Boat Cove, with other observations being collected opportunistically. We should also decide whether it would be useful to do "disturbance watches" where we sample walrus behavior at different locations on a schedule.

Wildlife: We will continue to observe the three bird plots for productivity. Although we sampled our two count plots sporadically, we plan to continue to have at least two count plots to monitor. We will also continue to trade walrus numbers and other information with USFWS at Cape Peirce.

As will be evident from the Appendices, this year the count data have been transferred into LOTUS and DBASE files. We hope that this will make data from Round Island more available and more accurate as well as more easily updated.

Ivory: It is now going on three years since we first attempted to establish a trust fund for Round Island into which we could place the proceeds from the ivory sales. To date, the ivory remains unsold. Round Island personnel will continue to keep the beaches as clean of ivory as possible, but if the ivory is only going to sit in storage, perhaps we should consider disposing of the ivory well offshore as a more efficient though less lucrative alternative.

Management plan: No further action has been taken on the management plan. However, this is a very timely juncture for updating and modifying the current plan. As competition for fish and oil continue to be factors in Bristol Bay, we may need an "officially approved" document to which to refer as well as which may provide us in-house support.

APPENDIX 1. 1989 VISITOR USE OF ROUND ISLAND

Date	Party size	Cum. vis.	Days stay	Vis. days	Cum. days	Via	From
MAY							
16	1	1	1	1	1	FWP hel.	D'ham
19	3	4	1	3	4	Pagan	Anch.
22	1	5	1	1	5	PS-1	Homer
22	4	9	1	4	9	NORPAC	AK, WN NV, FL
JUNE							
4	1	10	3	3	12	Puffin	D'ham
4	2	12	4	8	20	"	BELG.
5	1	13	11	11	31	"	USFWS
6	2	15	5	10	41	"	WGerm
7	1	16	7	7	48	"	WGerm
10	2	18	4	8	56	"	D'ham
10	1	19	2	2	58	"	D'ham
10	1	20	4	4	62	"	D'ham
10	2	22	2	4	66	"	D'ham
13	1	23	2	2	68	"	USFWS
17	2	25	2	4	72	"	D'ham
18	8	33	5	40	112	"	D'ham
22	1	34	4	4	116	"	Anch. D'ham
22	2	36	7	14	130	"	CA
25	3	39	5	15	145	"	Seward, Unal.
26	3	42	5	15	160	"	Anch.
27	2	44	2	4	164	"	CA
27	1	45	1	1	165	"	Seward
29	2	47	4	8	173	"	Anch.
30	4	51	1	4	177	"	Unal. lodge
JULY							
2	2	53	6	12	189	"	Anch. NJ
2	2	55	6	12	201	"	TX
3	13	68	6	78	279	"	VanOs
3	1	69	9	9	288	"	VanOs
8	2	71	3	6	294	"	D'ham LA
8	2	73	5	10	304	"	CO
8	8	81	4	32	336	"	VanOs
9	2	83	1	2	338	"	Gird- wood
9	1	84	4	4	342	"	Anch.
10	2	86	5	10	352	"	Anch. KTUU
14	2	88	7	14	366	"	Anch.
14	2	90	7	14	380	"	Anch.
14	1	91	5	5	385	"	NC
15	1	92	6	6	391	Puffin	OR

DATE	Party size	Cum. vis.	Days stay	Vis. days	Cum. days	Via	From
18	1	Ret.	3	3	394	Puffin	USFWS
18	2	94	3	6	400	"	Anch.
18	4	98	3	12	412	"	NY
20	1	99	6	6	418	"	SWITZ.
22	1	100	6	6	424	"	MN
22	1	101	6	6	430	Puffin	Adak
22	4	105	1	4	434	Bandit	WN
23	1	Ret.	5	5	439	Puffin	D'ham
23	1	106	5	5	444	Puffin	Juneau
23	2	108	5	10	454	Puffin	Anch.
27	8	116	1	8	462	Orion	Aleg.
28	4	120	8	32	494	Puffin	AZ
31	1	121	5	5	499	"	Shemya
31	4	125	11	55	543	"	JAPAN
AUG.							
4	1	126	2	2	545	"	WGERM
4	2	128	3	6	551	"	AUSTRIA
4	3	131	4	12	563	"	D'ham
5	2	133	3	6	569	"	TX
5	1	134	3	3	572	"	D'ham
5	1	135	5	5	577	"	Bethel
5	4	139	5	20	597	"	DEL.
7	2	141	1	2	599	"	WN
10	1	142	8	8	607	"	NY
10	1	143	3	3	610	"	SWITZ.
12	1	144	6	6	616	"	MASS
12	2	146	6	12	628	"	FRANCE
13	2	148	3	6	634	"	FLA
13	2	150	4	8	642	"	D'ham
13	2	152	3	6	648	Puffin	Fbx.
13	2	154	1	2	650	Bris.Jet	MA
14	1	155	4	4	654	Puffin	D'ham
14	6	161	1	6	660	Puffin	Tog. Fish.
16	2	163	1	2	662	Escul.	WN
24	6	169	1	6	668	Puffin	SWITZ CAL.

Total day visitors= 46
Total campers =123

169

APPENDIX 3. 1989 BOAT CONTACT MADE

5/9	Freedom (Bethel)
5/9	Fulpac I (Peter Pan)
5/9	Lady Alaska
5/16	JESC (Korean)
5/16	Aleutian Son
6/1	Sprig 2 (tender)
6/4	Lois Anderson
6/4	Arctic Tern *
6/4	Kavik (tug)
6/26	Sculpin
7/3	AK boat #56758
8/6	Arctic Maru
8/22	Koyo Maru

Lucy Belle II - cruised E. side

* Denotes boat slow to comply with our requests and/or exhibiting suspicious behavior.

APPENDIX 4. 1989 IVORY COLLECTED FROM ROUND ISLAND

<u>USFWS seal</u>	<u>LENGTH (cm)</u>	<u>WIDTH (cm)</u>
-------------------	--------------------	-------------------

TUSKS

D263	75.4	23.8
D264	82.0	26.7
D265	68.1	27.0
D266	72.0	21.1
D267	54.8	20.4
D268	48.0	21.5
D269	72.6	20.0
D270	38.0	18.5
D271	28.0	13.8
D272	71.0	21.1
D273	65.8	19.5
D274	66.8	20.0
D275	64.2	22.3
D276	51.9	22.3
D277	56.3	22.2
D278	73.3	23.0
D279	78.2	22.7
D280	64.8	19.2

NOSEPLATE

D281A	62.0	22.2
D281B	61.0	22.1

APPENDIX 5. INVENTORY

LEFT ON ROUND ISLAND, 1989

Baking bucket

1 1/2#w.wheat flour
5# white flour
5# half & half flour
3# cornmeal

Box 3

sm.box laundry detergent
18 rolls t.p.
6 rolls paper towel

Box 1

2# pancake mix
6# quick oats
2# bran
4# raw almonds
24 oz.Saffola oil
1 1/2# honey bear
1 box lemon zinger tea
2# brown sugar
open tin instant buttermilk
1# raisins
2# date pieces
8 qts + small box dried milk

Box 4

3 rolls handiwrap
2 rolls alum. foil
2 rolls waxed paper
1 box (30) gallon ziplock
1 box (50) quart ziplock
3 boxes (100 ea.)sandwich zip.
40 + 80 babywipes

Box 2

5# spaghetti
1 1/2 lasagna noodles
3 1/2# couscous
5 pkg Ramen
3 soup mixes + 1 Erbswurst
2# jam(straw.& rasp)
50 envelopes hot cocoa
2 bottles syrup
2 tins brown bread
asst.beans including
3# garbanzo, 1# black,
1 1/2# aduki, 1# pinto-
many more in bean tin

FUEL

Icehouse

3 1/2 5-gal cans premix, (including 1 on bottom from 1988 and 2 partly full)

1 full propane

Gasbox

1 full propane

1 1/2 5-gal tins Blazo

4 5-gal tins stove oil--gas box

Additional

propane on cabin partly full, as is propane on tub barrel for stove is 2/3 full

APPENDIX 5A

IN WAREHOUSE WARM STORAGE

Bucket A

1 sm.jar dill pickles
1 pt.mayonnaise
15 (6 1/2 oz)tuna fish
1 (12 1/2 oz)tuna fish
1 small jar chopped garlic
3 1/2 oz caviar
3 cans tomato soup
2 cans clam chowder

Box A

6 cans pears
2 cans pineapple
4 cans black olives
3 cans gr. beans
2 cans kernel corn
1 sm.HOT enchilada sauce
4 V-8 juices, small

Bucket B

9 lg. cans tomato paste
1 can stewed tomatoes
3 boxes crackers (stale?)
1 lg. jar light Miracle whip

WISH LIST

tent(\$200-300)
armored 7x35 binoculars(\$200-300)
spare battery for handheld VHF
new NE window (rt.hand, facing cabin)
in-line water filter (\$90-150)
paint for all structures including hot tub decking (\$60-100)
3-burner propane stove for tub
new mattresses (\$70-80 ea.)
1 pr.spare oars (\$50)
new antenna for 4560-SSB

We need to also consider a replacement for the Zodiac within the next two years (1990 or 1991). It should make it through the next season. Also, we should think about recovering the roof of the cabin, as the asphalt is worn in some places--metal roofing would be great, but asphalt would be acceptable.

APPENDIX 6. 1989 ROUND ISLAND BIRD LIST

5/4/89	black-legged kittiwake
	pelagic cormorant
	common murre
	white-crowned sparrow
	green-winged teal
	harlequin
5/5/89	pigeon guillemot
	common raven
	glaucous gull
5/7/89	tree sparrow
	song sparrow
	snow bunting
	water pipit
	short-eared owl
	bald eagle
	parakeet auklet
	common snipe
5/8/89	common eider
	rough-legged hawk
5/10/89	redpoll
	rock ptarmigan
	wandering tattler
5/11/89	Lapland longspur
	tufted puffin
5/12/89	horned puffin
	savannah sparrow
5/13/89	hermit thrush
	pintail
5/24/89	tree swallow
5/28/89	least auklet
5/30/89	yellow-rumped warbler
6/6/89	crested auklet
6/11/89	cliff swallow
6/13/89	double-crested cormorant
7/7/89	thick-billed murre
7/10/89	mallard
7/17/89	western sandpiper
7/30/89	rock sandpiper
7/31/89	marbled murrelet
8/9/89	northern fulmar

APPENDIX 6A. 1989 ROUND ISLAND BIRD PRODUCTIVITY

	CORM	KITTIWAKES		
	cm	OP#1	OP#2	cm
Date of first egg	<5/6	6/14	6/10	6/22
Date of first hatch	6/7	7/15	7/10	unknown
Date of first fledging	7/27	no data	no data	--
Nest attempts	20	50	49	22
Nests with eggs	18	20	35	4
Mean clutch size	3.6	1.0	1.1	1.0
Hatch success	0.48	0.60	0.40	0
Chicks fledged	24	2	7	0
Fledge success	0.77	0.17	0.44	0
Reproductive success	1.30	0.10	0.20	0
Productivity	1.20	0.04	0.14	0

Clutch size = #eggs/nest with eggs

Hatch success = eggs hatched per eggs laid

~~Fledge success = chicks fledged per eggs hatched~~

Reproductive success = chicks fledged per nest with eggs

Productivity = chicks fledged per nest attempt

1989 ROUND ISLAND SEABIRD POPULATION COUNTS

		BlKi	CoMu	
Observation Pt.	6/16	199	310	
	6/28	217	323	
	7/10	190	351	
Tower	6/1	--	--	photo only
	6/16	353	942	
	6/28	361	1253	
	7/16	281	4360	
	8/4	122	1991	

BlKi=Black-legged kittiwake

CoMu=Common murre

APPENDIX 7A. 1989 ROUND ISLAND WALRUS DISTURBANCES

DATE	BEACH	TYPE	#DIST./TOTAL	LEVEL	INDEX
5/08/89	MAIN	PLANE-FL	100/100	3	300
5/15/89	MAIN	UNKNOWN	15/150	5	75
5/22/89	BOAT COVE	PUFFIN	27/27	3	81
6/05/89	BOAT COVE	PUFFIN	21/21	5	105
6/06/89	FIRST	PEOPLE	1/1	3	3
6/12/89	BOAT COVE	PUFFIN	5/6	3	15
6/15/89	BOAT COVE	PUFFIN	5/99	1	5
6/17/89	BOAT COVE	PUFFIN	8/27	3	24
6/20/89*	E.MAIN	PLANE-FL	100/2000	5	500
6/20/89*	E.MAIN	PLANE-FL	1900/2000	1	1900
6/30/89	BOAT COVE	PUFFIN	20/28	3	60
7/02/89	BOAT COVE	PUFFIN	6/6	5	30
7/03/89	BOAT COVE	BOAT-LA	10/10	3	30
7/07/89	BOAT COVE	PUFFIN	13/14	5	65
7/11/89	BOAT COVE	PUFFIN	20/30	3	60
7/11/89	W.MAIN	UNKNOWN	100/100	3	300
7/12/89	BOAT COVE	PUFFIN	3/18	5	15
7/12/89	FIRST	PEOPLE	12/85	3	36
7/14/89	BOAT COVE	PUFFIN	20/20	5	100
7/18/89	BOAT COVE	PUFFIN	30/30	3	90
7/20/89	BOAT COVE	PUFFIN	30/100	3	90
7/22/89	BOAT COVE	PUFFIN	300/600	5	1500
7/23/89	BOAT COVE	PUFFIN	75/150	3	225
7/25/89	BOAT COVE	PLANE-FL	35/66	5	175
7/31/89	BOAT COVE	PUFFIN	4/14	5	20
8/04/89	BOAT COVE	PUFFIN	35/60	3	105
8/07/89	BOAT COVE	PUFFIN	12/14	3	36
8/12/89	BOAT COVE	PUFFIN	8/25	3	24
8/15/89	MAIN	PLANE-FL	800/1500	5	4000
8/16/89	BOAT COVE	BOAT-LA	21/21	5	105

* Both disturbances on 6/20/89 took place at same time and location; however, walruses involved were disturbed to differing degrees.

Plane-Fl= plane flying.

Boat-La=any boat except Puffin or Zodiac landing.

1989 ROUND ISLAND
DAILY WALKER COUNTS

DATE	N. 41IN SOUTH	N. MAIN	MAIN BEACH	N. BOAT COVE	BOAT COVE	FIRST	FIRST PRIME	SECOND	SECOND PRIME	E. SIDE TOTAL	BOAT (EAST)	BOAT (ISLAND)
MAY 5	N/C	N/C	2000	0	0	115	0	0	0	N/C	N/C	N/C
	N/C	N/C	1174	2	41	65	0	118	0	1400	N/C	N/C
	N/C	N/C	108	0	0	0	0	0	0	108	N/C	N/C
	N/C	N/C	280	0	0	0	0	0	0	280	N/C	N/C
	N/C	N/C	102	0	0	0	0	0	0	102	N/C	N/C
10	N/C	N/C	200	0	0	0	0	0	0	200	N/C	N/C
	N/C	N/C	57	0	0	0	0	0	0	57	N/C	N/C
	N/C	N/C	190	0	0	0	0	0	0	190	N/C	N/C
	N/C	N/C	589	0	0	0	0	0	0	589	N/C	N/C
	N/C	N/C	885	0	2	0	0	0	0	887	N/C	N/C
15	N/C	N/C	914	0	3	0	0	0	0	917	N/C	N/C
	N/C	N/C	375	0	0	0	0	0	0	375	N/C	N/C
	N/C	N/C	166	0	0	0	0	0	0	166	N/C	N/C
	N/C	N/C	245	0	0	0	0	0	0	245	N/C	N/C
	N/C	N/C	195	0	0	0	0	0	0	195	N/C	N/C
20	N/C	N/C	392	0	0	0	0	0	0	392	N/C	N/C
	N/C	N/C	870	0	0	0	0	0	0	870	N/C	N/C
	N/C	N/C	756	0	54	80	0	0	0	890	N/C	N/C
	300	800	1324	0	104	96	0	50	0	1574	1574	2674
	N/C	N/C	845	0	0	75	0	110	0	1030	N/C	N/C
25	829	800	920	0	4	103	4	175	0	1206	2558	4187
	N/C	N/C	1710	0	6	74	0	95	0	1885	N/C	N/C
	N/C	N/C	693	0	4	5	0	15	0	717	N/C	N/C
	N/C	N/C	25	0	0	0	0	0	0	25	N/C	N/C
	N/C	N/C	182	0	0	0	0	0	0	182	N/C	N/C
JUNE	N/C	N/C	800	0	1	0	0	0	0	801	N/C	N/C
	N/C	N/C	400	0	0	0	0	0	0	400	N/C	N/C
	1127	1100	1050	0	6	0	0	0	0	1056	1308	3535
	N/C	N/C	1175	0	22	0	0	2	1	1200	N/C	N/C
	N/C	N/C	565	0	0	0	0	0	0	565	N/C	N/C
5	N/C	N/C	72	0	0	0	0	0	0	72	N/C	N/C
	N/C	N/C	434	0	7	0	0	0	0	441	N/C	N/C
	N/C	N/C	598	0	4	0	0	0	0	602	N/C	N/C
	547	619	590	0	3	2	0	0	0	595	2182	3348
	1000	676	675	0	24	0	0	0	0	699	1893	3479
10	N/C	N/C	300	0	0	0	0	0	0	300	N/C	N/C
	N/C	N/C	42	0	0	0	0	0	0	42	N/C	N/C
	N/C	400	0	0	0	0	0	0	0	400	N/C	N/C
	1415	845	200	0	2	0	0	0	0	202	1241	3501
	N/C	N/C	850	5	5	0	3	0	0	863	N/C	N/C
15	N/C	N/C	650	0	9	1	0	0	0	660	N/C	N/C
	1391	1005	2000	0	16	0	0	0	0	2016	2546	4942
	N/C	N/C	2327	30	99	94	6	0	7	2563	N/C	N/C
	N/C	N/C	1046	13	22	100	0	48	0	1229	N/C	N/C
	N/C	N/C	1170	9	27	98	0	98	3	1405	N/C	N/C
20	N/C	N/C	881	0	0	88	0	103	0	1072	N/C	N/C
	N/C	N/C	765	0	12	86	0	83	0	946	N/C	N/C
	N/C	N/C	78	0	0	0	0	0	0	78	N/C	N/C
	N/C	N/C	1	0	1	0	0	0	0	2	N/C	N/C
	N/C	N/C	20	0	0	0	0	0	0	20	N/C	N/C

1989 ROUND ISLAND
DAILY WALRUS COUNTS

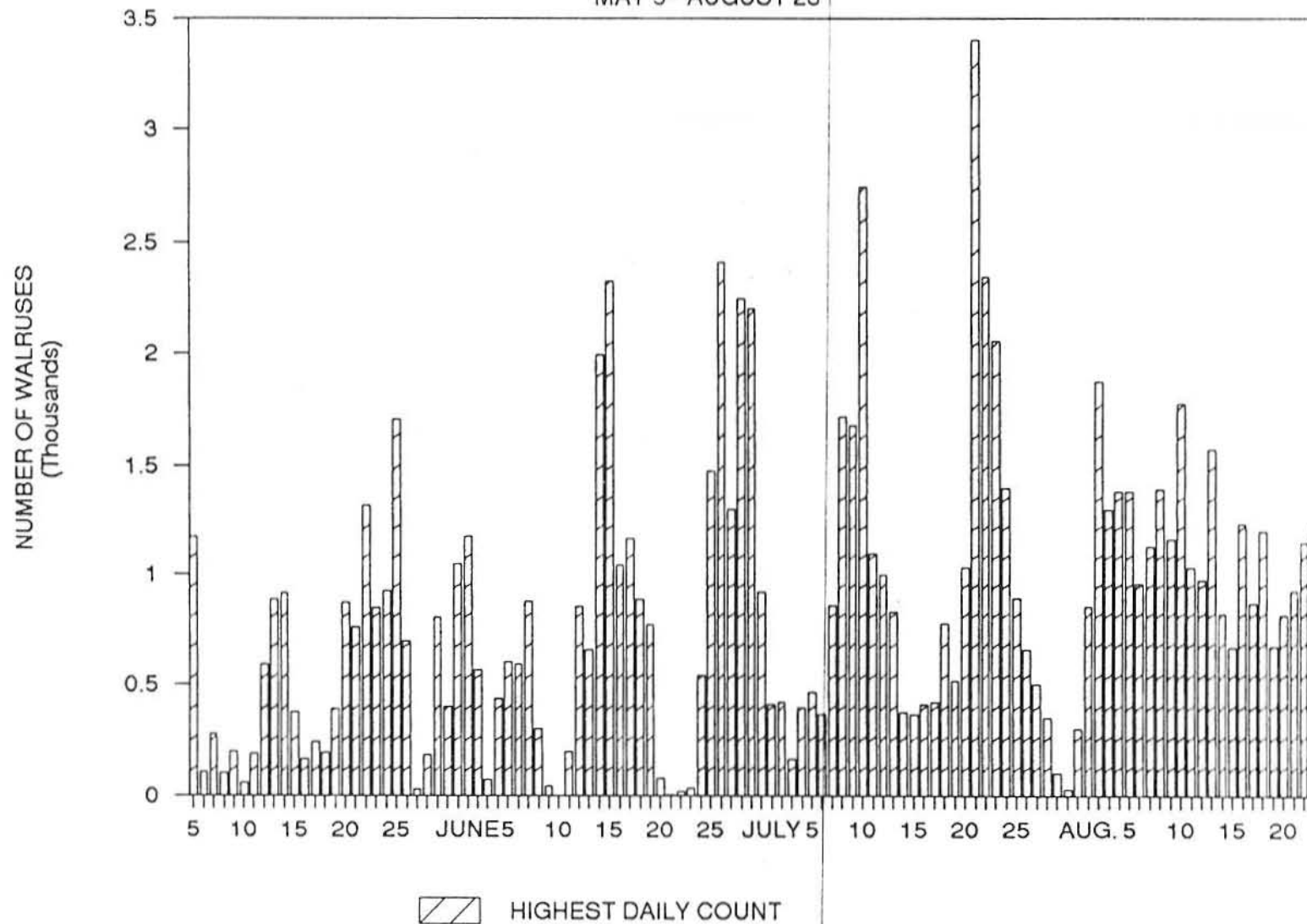
DATE	W. MAIN SOUTH	N. MAIN	MAIN BEACH	N. BOAT DOVE	BOAT DOVE	FIRST PRIME	SECOND PRIME	SECOND PRIME	E. SIDE TOTAL	BOAT (EAST)	BOAT (ISLAND)
JULY	N/C	N/C	33	1	5	0	0	0	39	N/C	N/C
	N/C	N/C	540	4	53	45	0	45	687	N/C	N/C
	25	N/C	1480	0	78	191	0	431	2180	N/C	N/C
	N/C	N/C	2410	8	43	274	98	365	3253	N/C	N/C
	N/C	N/C	1310	12	23	325	172	388	2299	N/C	N/C
	N/C	N/C	2252	0	56	305	122	463	3398	N/C	N/C
	338	947	2204	5	87	173	73	261	2879	2996	4281
	N/C	N/C	916	0	78	123	35	240	1392	N/C	N/C
	N/C	N/C	410	0	5	68	0	99	582	N/C	N/C
	N/C	N/C	420	0	6	53	2	52	533	N/C	N/C
5	N/C	N/C	166	0	15	0	0	0	181	N/C	N/C
	N/C	N/C	396	0	22	0	7	0	425	N/C	N/C
	N/C	N/C	464	104	49	145	0	12	774	N/C	N/C
	N/C	N/C	365	111	36	102	0	8	622	N/C	N/C
	N/C	N/C	856	122	77	170	77	175	1477	N/C	N/C
	N/C	N/C	1725	180	180	207	145	220	2677	N/C	N/C
	480	895	1685	113	123	229	115	550	3016	4846	6221
	10	N/C	2745	140	304	277	193	485	4360	N/C	N/C
	N/C	N/C	1102	122	39	270	126	297	2151	N/C	N/C
	N/C	N/C	1000	0	21	130	8	195	1364	N/C	N/C
15	N/C	N/C	825	0	24	129	0	103	1081	N/C	N/C
	N/C	N/C	375	7	23	5	0	62	472	N/C	N/C
	N/C	N/C	365	7	40	45	10	190	659	N/C	N/C
	N/C	N/C	410	0	7	120	0	190	727	N/C	N/C
	N/C	N/C	420	0	28	125	0	230	806	N/C	N/C
	N/C	N/C	770	0	0	137	8	215	1130	N/C	N/C
	N/C	N/C	515	0	34	145	0	195	891	N/C	N/C
	20	N/C	1037	25	109	235	110	337	1868	N/C	N/C
	N/C	N/C	3402	165	374	384	220	530	5360	N/C	N/C
	957	1130	2346	200	659	395	210	670	4880	5805	7792
25	N/C	N/C	2060	163	310	283	125	310	3501	N/C	N/C
	N/C	N/C	1407	30	121	165	60	276	2261	N/C	N/C
	0	115	888	27	122	170	34	270	1651	1388	1503
	N/C	N/C	650	0	23	110	42	187	1028	N/C	N/C
	N/C	N/C	500	0	15	101	56	105	809	N/C	N/C
	N/C	N/C	357	0	7	72	0	107	582	N/C	N/C
	N/C	N/C	100	0	4	25	0	36	166	N/C	N/C
	N/C	N/C	30	0	17	52	0	24	123	N/C	N/C
	N/C	N/C	305	5	20	174	0	93	597	N/C	N/C
	AUG.	N/C	847	40	240	280	98	287	1792	N/C	N/C
5	N/C	N/C	1884	204	339	313	206	444	3464	N/C	N/C
	N/C	N/C	1312	74	186	253	149	330	2454	N/C	N/C
	N/C	N/C	1392	40	135	220	142	347	2527	N/C	N/C
	N/C	N/C	1393	5	3	172	90	253	2105	N/C	N/C
	N/C	N/C	955	0	17	160	75	276	1648	N/C	N/C
	N/C	N/C	1135	0	14	141	70	225	1635	N/C	N/C
	N/C	N/C	1404	4	15	120	36	153	1732	N/C	N/C
	0	375	1167	6	23	40	0	100	1336	1951	2326
	10	N/C	1784	0	27	219	41	161	2239	N/C	N/C
	N/C	N/C	1036	0	74	162	0	173	1451	N/C	N/C

1989 ROUND ISLAND
DAILY WALRUS COUNTS

DATE	W. MAIN SOUTH	W. MAIN	MAIN BEACH	W. BOAT COVE	BOAT COVE	FIRST FIRST	FIRST PRIME	SECOND SECOND	SECOND PRIME	E. SIDE TOTAL	BOAT (EAST)	BOAT (ISLAND)
	N/C	N/C	975	0	49	129	0	98	0	1251	N/C	N/C
	N/C	N/C	1579	0	19	179	6	190	10	1983	N/C	N/C
	N/C	N/C	812	0	11	99	0	160	2	1084	N/C	N/C
15	N/C	N/C	660	0	9	186	0	9	5	869	N/C	N/C
	N/C	N/C	1240	30	21	165	0	6	0	1462	N/C	N/C
	N/C	N/C	861	51	11	174	3	8	0	1108	N/C	N/C
	N/C	N/C	1206	56	28	174	0	18	2	1484	N/C	N/C
	N/C	N/C	669	5	28	235	0	170	12	1120	N/C	N/C
20	N/C	N/C	810	0	22	107	0	135	6	1080	N/C	N/C
	N/C	N/C	921	0	44	148	3	215	1	1332	N/C	N/C
	N/C	N/C	1155	0	14	115	0	166	0	1450	N/C	N/C
	N/C	N/C	1227	9	13	125	0	200	0	1574	N/C	N/C
	N/C	N/C	1246	39	68	111	0	139	0	1603	N/C	N/C
25	N/C	N/C	1234	23	39	130	0	225	1	1652	N/C	N/C

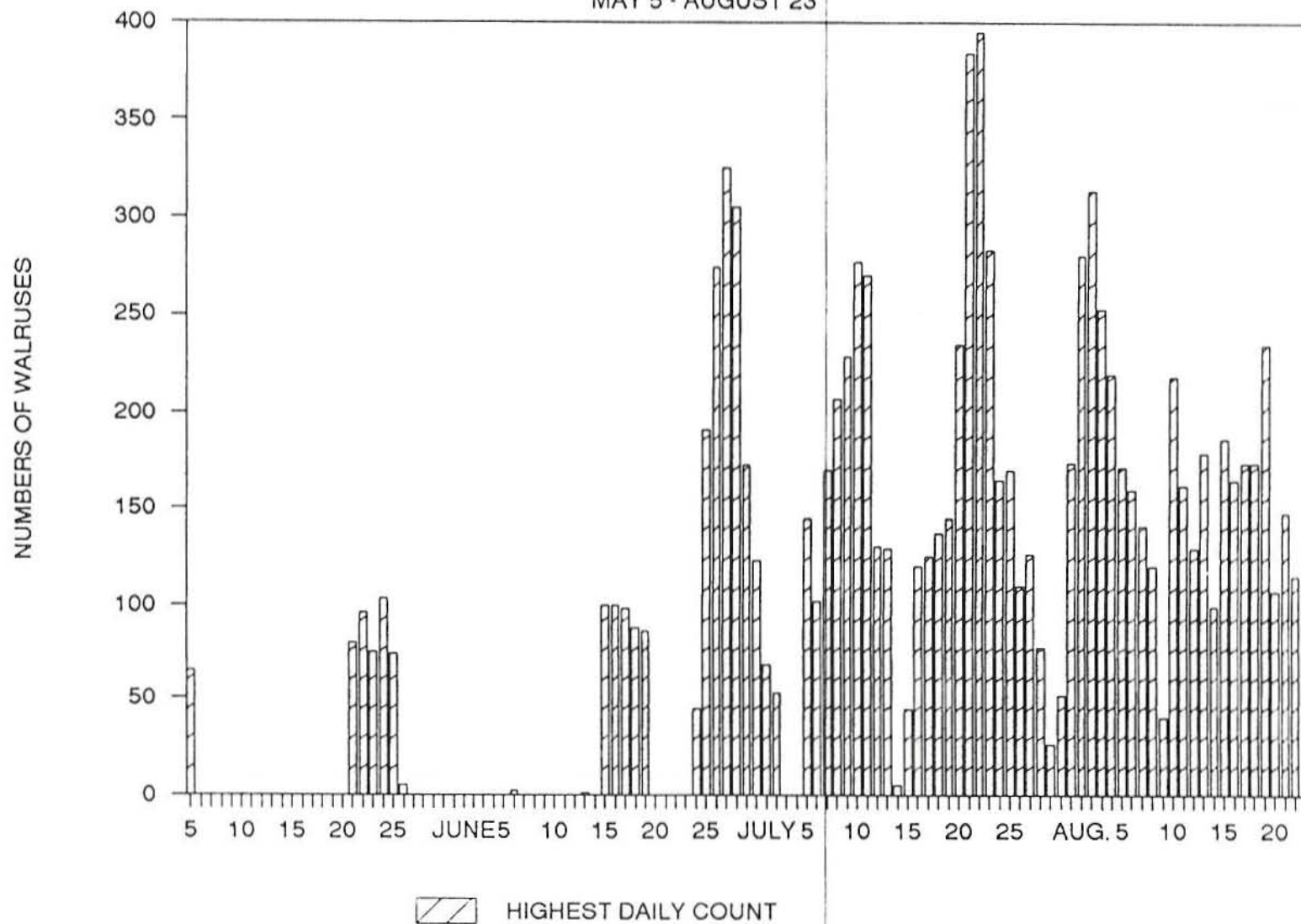
1989 ROUND ISLAND - MAIN BEACH COUNTS

MAY 5 - AUGUST 23



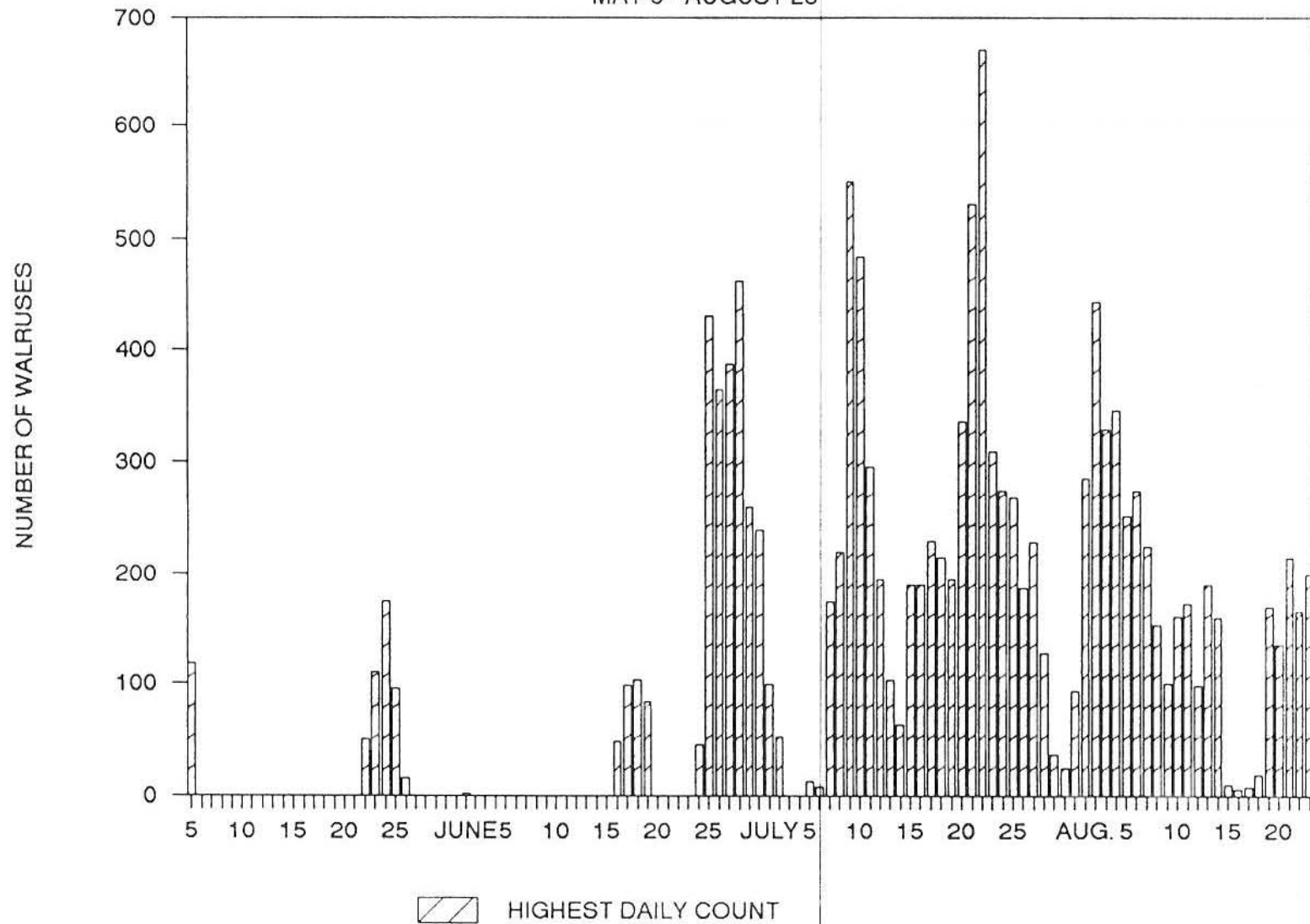
1989 ROUND ISLAND - FIRST BEACH COUNTS

MAY 5 - AUGUST 23



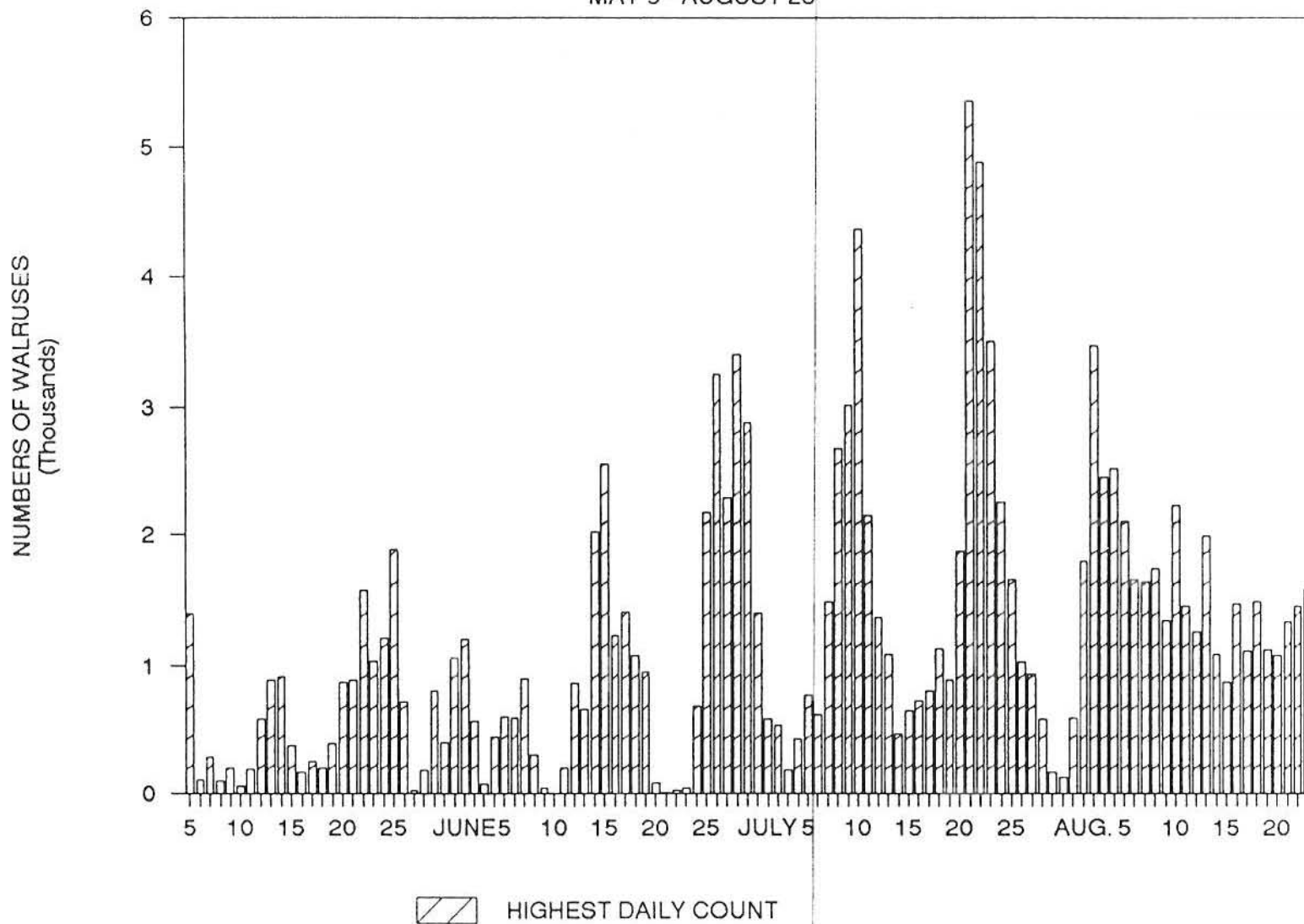
1989 ROUND ISLAND - SECOND BEACH COUNTS

MAY 5 - AUGUST 23



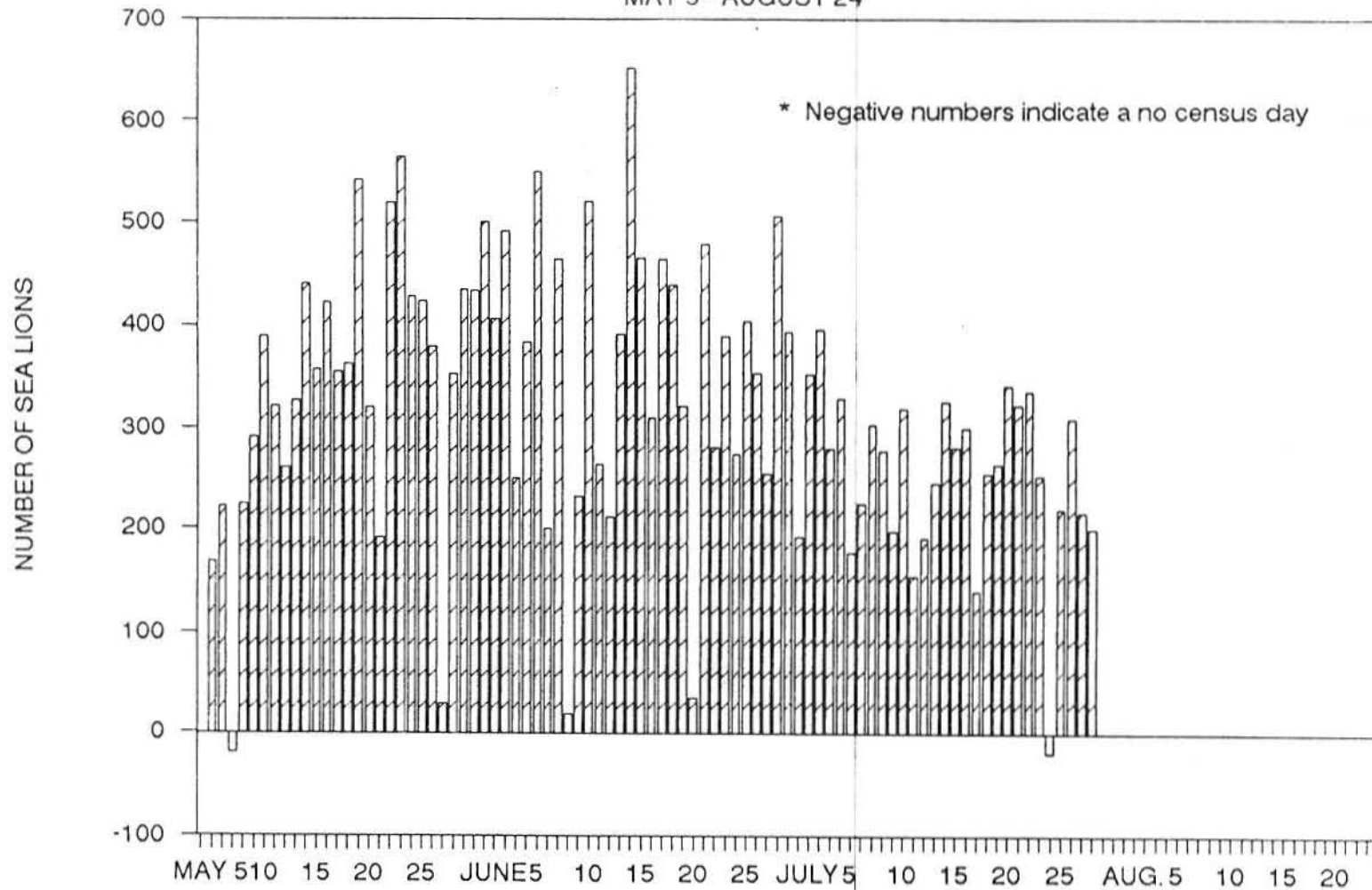
1989 ROUND ISLAND - EAST SIDE TOTAL

MAY 5 - AUGUST 23



1989 ROUND ISLAND - SEA LION COUNTS

MAY 5 - AUGUST 24



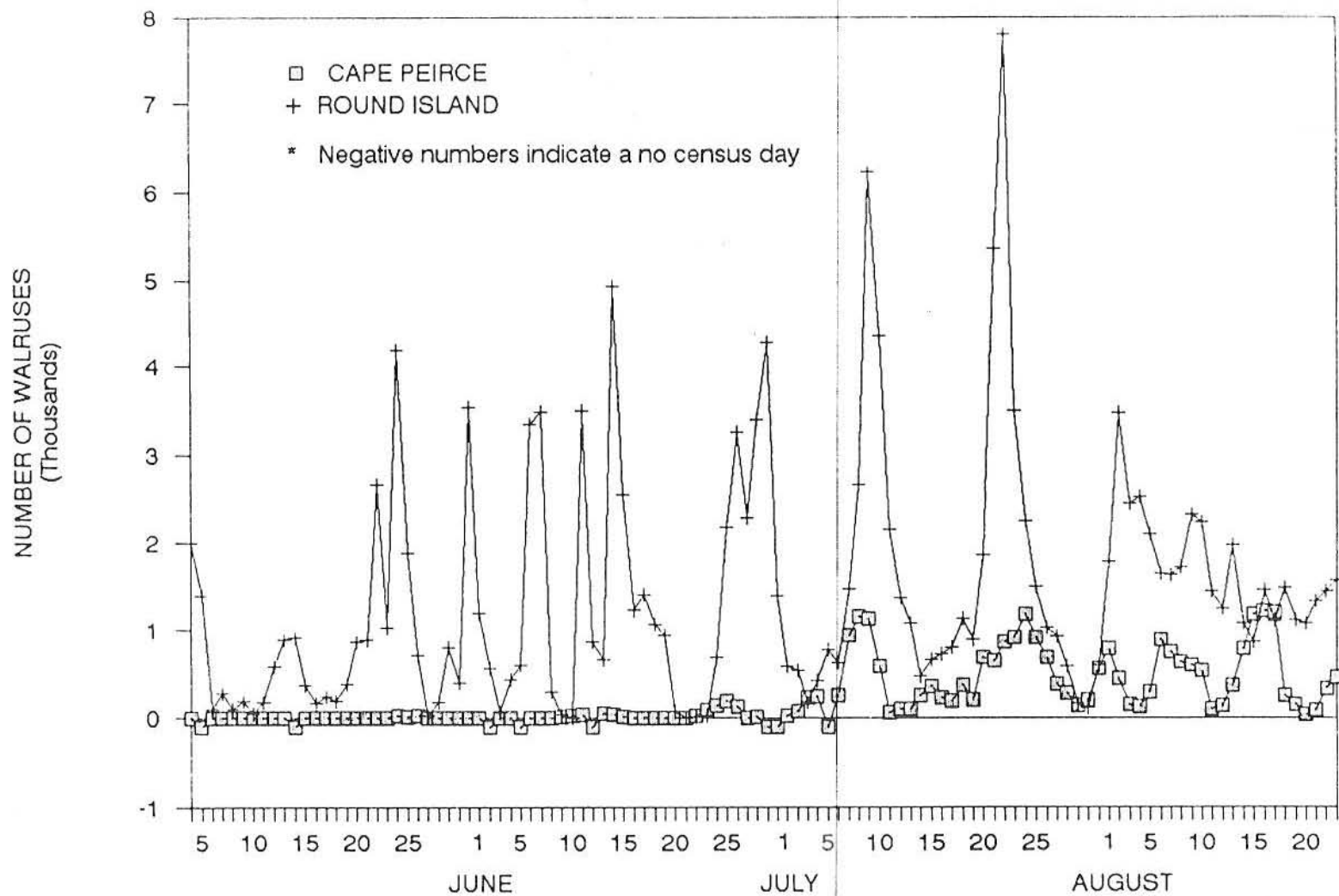


Figure 1. Chronology of pacific walrus (*Odobenus rosmarus*) numbers at both Cape Peirce and Round Island, Bristol Bay, Alaska, 1989.

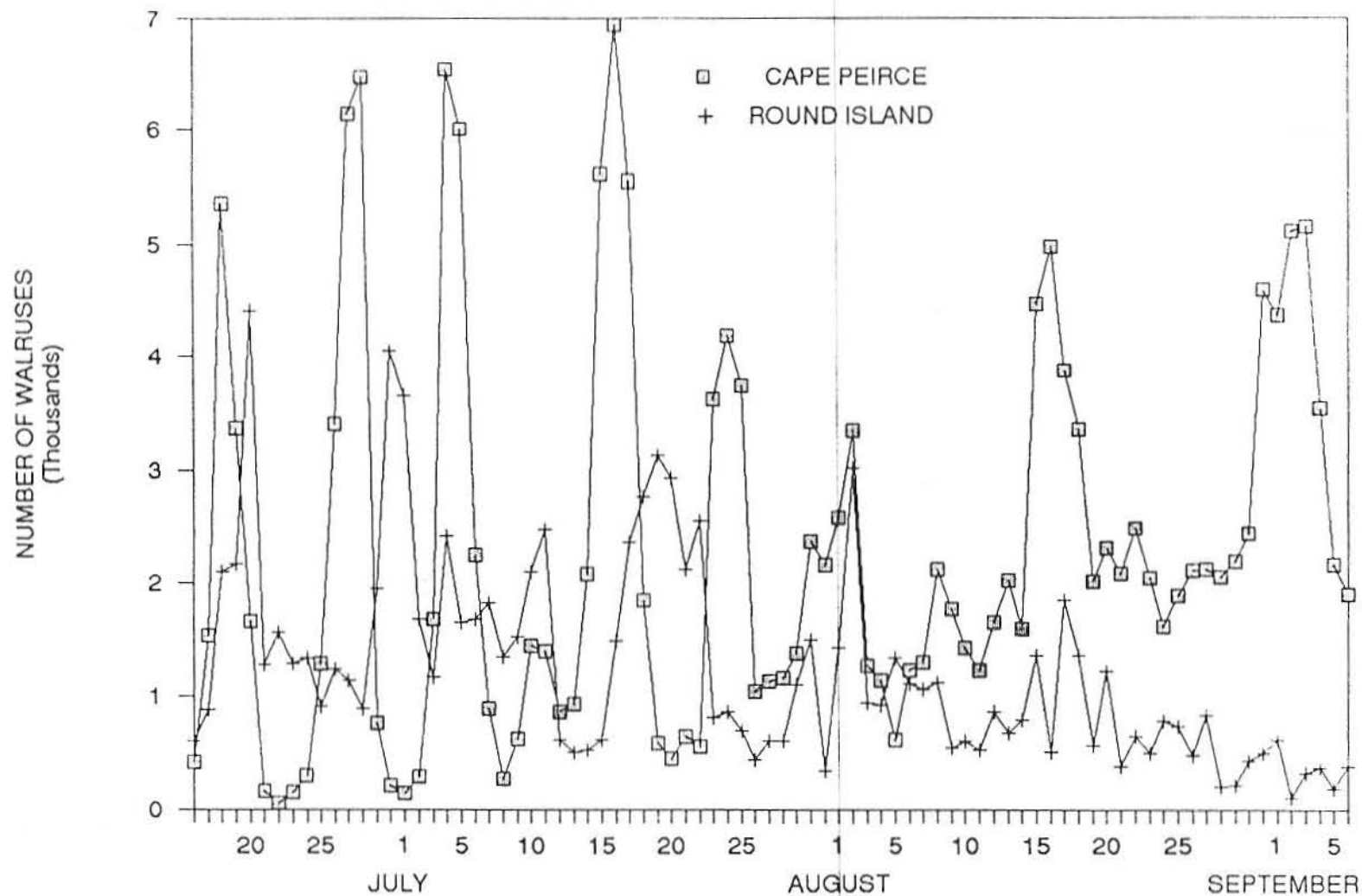


Figure 2. Chronology of Pacific walrus (*Odobenus rosmarus*) numbers at both Cape Peirce and Round Island, Bristol Bay, Alaska, 1988.