

**AN INITIAL ATTEMPT AT LEAST AUKLET *AETHIA PUSILLA* PRODUCTIVITY
SAMPLING AT ST. GEORGE ISLAND, ALASKA IN 2007**



photo: N. Konyukhov

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Introduction

A large proportion of the world's population of least auklets (*Aethia pusilla*) breeds on the Alaska Maritime National Wildlife Refuge (AMNWR; SOWLS et al. 1978). Several fundamental demographic variables are difficult to obtain for auklets compared to most other seabird species monitored by the refuge because auklets usually nest in inaccessible rock crevices. Finding nest sites to monitor is particularly difficult on islands with arctic foxes, like the Pribilof Islands, because auklets tend to go deep into boulder piles to avoid fox predation.

St. George Island is one of nine annual ecological monitoring sites on AMNWR. Located in the Pribilof Island group in the southeastern Bering Sea, this island has been part of a seabird monitoring program by the refuge since 1985, and prior to that time by other researchers. The objective of the monitoring program on St. George is to detect changes in populations, reproductive performance, chronology, survival, and food habits of selected species for comparisons with similar efforts elsewhere on the refuge and in Alaska. Data collected are used to detect trends in marine bird populations; to provide a basis for directing management and research actions; and to assess the effects of management.

One of the data gaps has been reproductive success of least auklets in the Pribilofs, which is important because this species is the most abundant planktivore nesting there and no other obligate planktivores are monitored. A few nest sites were studied at St. George during an earlier study (Roby and Brink 1986) but no productivity monitoring program for auklets has been established. My objective in 2007 was to try to set up a productivity monitoring program at St. George. Comparable data are collected at Buldir, Kiska, and Kasatochi islands.

Methods

I stayed on St. George from 17 May to 7 August 2007 to establish productivity monitoring for least auklets. I spent dozens of hours searching for eggs that could be viewed from the surface of the talus nesting areas at Ulakaia Ridge and near the harbor in Zapadni Bay (Figure 1.). All visible occupied nest chambers were marked with flagging tape. If birds were present in them during two consecutive checks that nest site was marked with a numbered flag. At the end of field season all crevices were marked by painting spots and numbers on nearby rocks (Figure 2). Following discovery, occupied least auklet crevices were checked every 5th day (Williams et al. 2002).

A total of 51 artificial nest boxes were installed at St. George in 2003 in an attempt to create a situation for monitoring (Harding and Guldager 2003). A complete check of all nest boxes was made on 30 and 31 July 2007, at a time when chicks at the colony were large and no longer being constantly attended by parents.

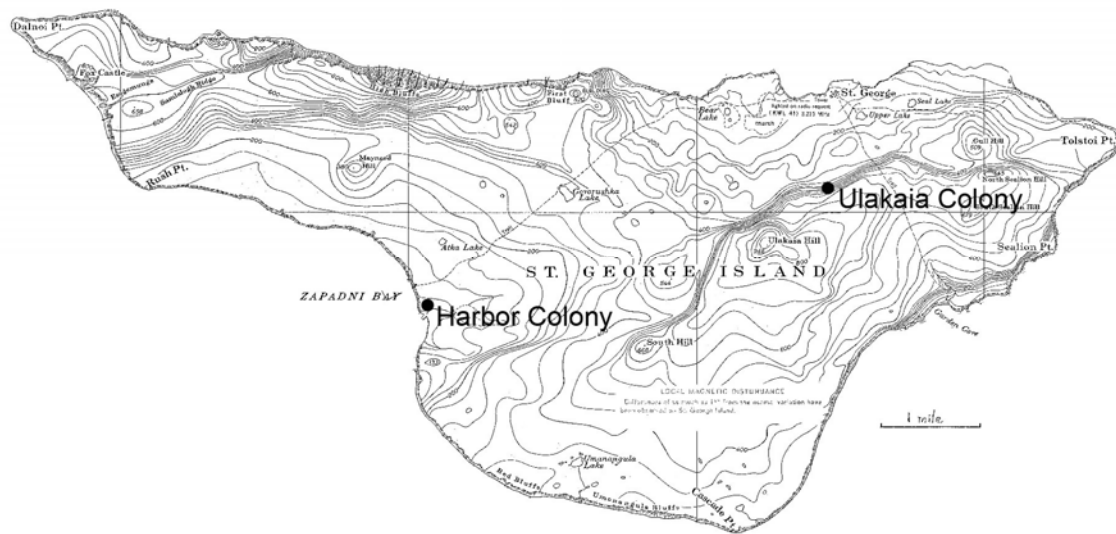


Figure 1. Position of least auklet colonies on St. George Island, Alaska.

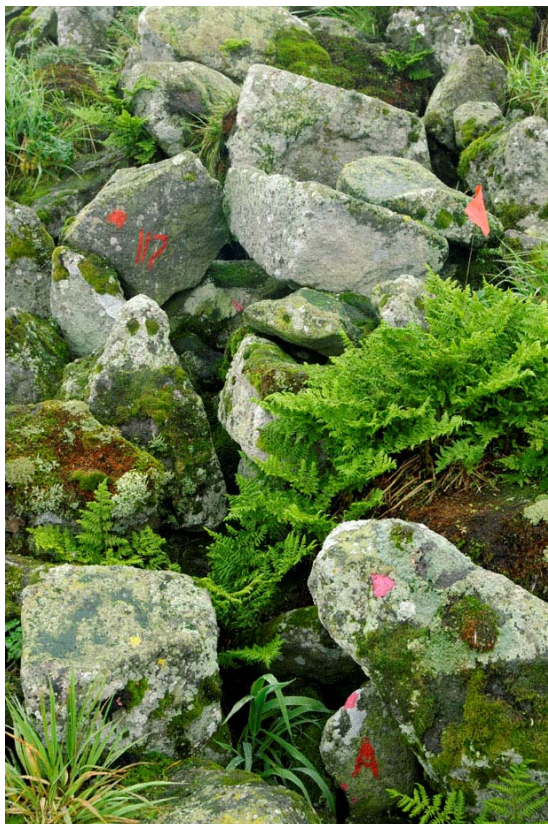


Figure 2. Marking of least auklet nest positions at the colony. St. George Island, Alaska.

Results

After inspecting the harbor area in late May, I determined that it was not likely to provide suitable monitoring opportunities because: 1) the breakwater was constructed with huge boulders which were covered with gravel that filled up the spaces between boulders near the surface, forcing auklets to nest very deep and out of view of observers; and 2) winter storms tend to move the boulders around and there is periodic repair to the breakwater, so it would be impossible to track individual sites among years.

In contrast, the Ulakaia colony had a more “stable” structure including some areas where crevices were shallow enough for observers to view eggs and chicks with flashlights. In total, I found and observed 129 crevices at the Ulakaia colony, of which 52 were suitable (or possibly suitable) to monitor least auklet productivity (see Appendix 1). Several of the nest sites that were unsuitable for season-long monitoring may still be of use for determining nesting chronology. Since 2007 was such a late year for auklet nesting on Ulakaia Ridge, and since observers left the island before most of the chicks had fledged, it was not possible to estimate least auklet productivity for this year. Locations of nests are illustrated in Appendix 2.

Phenology and Chick Survival

In 2007, the first adults were seen carrying food to chicks 6-10 days earlier at the harbor colony than at Ulakaia (i.e., on 2 July about 5-7% of the adults were carrying food at the harbor, but the first food-carrying adult was not seen until 8 July at Ulakaia Ridge). This difference very likely resulted from late melting snow at Ulakaia which delayed access to nest sites there (Figure 3). About 35-40% of the Ulakaia colony area was covered with snow on 18 May, and even in areas where snow did not completely cover the surface, the majority of crevices were filled with snow and ice. The last patch of snow disappeared from the surface of the colony on 17 June. The mean hatch date for least auklets at Ulakaia Ridge in 2007 was 18 July ($n = 17$, $SD = 4.19$). Most auklets had fledged chicks and departed the harbor colony by 4 August, but many adults were still present on that date at Ulakaia Ridge.

The majority of chicks at monitored nest sites at Ulakaia Ridge (Appendix 1) were still too young to be considered fledged on my final visit to the colony. Nevertheless, it was apparent that chick survival was high because none of the chicks I followed died during the observation period.

Predation

In notable contrast to other recent years, in 2007 I did not observe breeding dens of arctic foxes (*Alopex lagopus pribilofensis*) at the Ulakaia colony. In fact, I believe only one fox was present at the colony. Late in the breeding season this animal was seen at the colony every time I visited there, and was observed eating both adult birds and chicks.

A male and a female or subadult snowy owl (*Nyctea scandiaca*) were present on St. George during the whole breeding season of 2007. They fed on both brown lemmings (*Lemmus [trimucronatus] nigripes*) and least auklets. Successful auklet captures were repeatedly observed at the colony.



Figure 3. Least auklet colony at Ulakaia ridge, St. George Island, Alaska on 18 May 2007.

Nest boxes

I tried to check all the boxes on 30 and 31 August, but I was unable to locate two of the structures (#40 and #45). At least six boxes were used by auklets in 2007. Boxes #5 and #6 contained eggs which failed to hatch (I removed the cold eggs at the end of the season). Chicks were found in four boxes (#11, #13, #31, and #38). I marked the locations of boxes containing chicks with dots of paint on nearby stones.

Notes

A good indicator of approaching egg laying is copulations of birds at the sea. Another sign of beginning of the nesting season is the nearly complete departure of birds from the colony after there has been an initial period of several days of activity. During the period of copulation birds usually fly to the sea in pairs but not in flocks.

Obtaining hatch dates directly is difficult because adult birds often sit tightly, obscuring the egg or small chick so, at the end of June observations of birds carrying food in gular pouches is a good indication that hatching has begun. Such observations should be conducted from 10-12 a.m. or 9-11 p.m. After the first detections of bird with food, more effort should be made to try to view contents of nest sites.

Observers need to remain at the colony until the majority of chicks have either fledged or reached an age where fledging is likely to occur (see Williams et al. 2002).

Searches for nest sites to monitor should only be carried out early in the season. The search for new nest sites should be suspended no later than about mid-incubation.

Acknowledgments

Art Sows has been the main force holding together the many projects on the Pribilof Islands and steering them into the future. I would also like to acknowledge the great company of Ram Papish, Karin and Rachel Holser, and Andrew Keller while staying on St. George Island. Vernon Byrd, Don Dragoo and Heather Renner edited the report.

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Appendix 1. Productivity of least auklets at the Ulakaia colony, St. George Island, Alaska in 2007.

Julian		Date																										
		166	168	170	171	174	175	176	179	180	181	180	186	189	190	191	194	196	198	199	200	201	206	211	216	Status	Age \geq	hatch date
quality	Nest #	15-Jun	17-Jun	19-Jun	20-Jun	23-Jun	24-Jun	25-Jun	28-Jun	29-Jun	30-Jun	1-Jul	5-Jul	8-Jul	9-Jul	10-Jul	13-Jul	15-Jul	17-Jul	18-Jul	19-Jul	20-Jul	25-Jul	30-Jul	04-Aug			
1	62								BU	BU		BU				N	BU					BU	BU	C	C	C	4	201
1	91														BU	BU	BE					BU	BU	BC	BC	C	4	
1	101																BU	BU				BU	BU	BU	C	C	4	
1	39					BU		BU		BU		BU				BE	BU					BU	C	C	C	C	9	
1	52						BU	BU		BU		BU				BU	BU					BU	BC	BC	C	C	9	
1	95															BU	BU					BU	BC	C	C	C	9	
1	104																BU	BU				BU	C	BC	C	C	9	
1	108																			BU		BU	C	BC	C	C	9	
1	112																		BU			BU	N	C	C	C	9	
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1	19	BU			BU			BU		BU		BU				BU	BU					C	C	C	C	C	14	
1	22	BU			BU			BU		BU		BU				BU	BU					BC	C	C	C	C	14	
1	23	BU			BU			BU		BU		N				C	C					BC	C	C	C	C	14	
1	26		BU		BU			BU		N		BU				BU	BU					BC	BC	C	C	C	14	
1	31				BU			BU		BU		BU				BU	BU					C	C	C	C	C	14	
1	36				BU			BU		N		BU				BU	BU					C	BC	N	C	C	14	
1	50					BU	BU			BU		BU				BU	BU					BC	BC	C	C	C	14	
1	58									BU	BU	BU				BU	BU					BC	BC	C	C	C	14	
1	61									BU	BU	BU				BU	BE					EP	BC	C	C	C	14	
1	66								BU		BU	BU				BU	BU					BC	BC	C	C	C	14	
1	84													BU		BU	BU					C	C	C	C	C	14	
1	87										BU					BE	BU					BC	C	C	C	C	14	
1	90														BE	BU	BU					BC	C	C	C	C	14	
1	34			BU				BU		BU		BU				BU	BC					BC	BC	BC	C	C	19	
1	44					BU		BU		BU		BU				BU	BC					C	C	C	C	C	19	
1	45					BE		BU		BU		BU				BU	BU					BC	BU	C	C	C	19	
1	54						BU	BU		BU		BU				BU	BC					C	BC	C	C	C	19	

1	59				BU	BU	BU	BU	N		N	N	N	C	C	19	
1	67				BU	BU	BU	BU	C		BC	BC	C	C	C	19	
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1	64				E	BU	BU	E	BC		BC	N	N	C	C	24	193
1	68				BU	BU	N	BC	BU		BC	C	C	C	C	24	
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1	113								BU		BU	BU	BU	C	C	24	
1	116									BU		BU	C	C	C		
1	117									C		C	C	C	C		
1	117A									BU			C	C	C		
1	106							BU	BU		BC	BC	BC	N	C?		
2	75		BU			BU	BU	BU	BU		BU	BU	BC	C	C	4	
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2	43		BU		BU		BU	BU	BU		BU	BC	BC	C	C	9	
2	46		BU		BU		BU	BU	BU		BU	C	C	C	C	9	
2	56			BU	BE		BU	BU	BE	BE	BE	BC	BC	C	C	9	203
2	71				BU		BU	BU	BU		BU	C	C	C	C	9	
2	107A								BU		BU	BC	C	C	C	9	
2	115									BE	BE	BC	BC	C	C	9	203
2	15	BU		BU		BU	BU	BU	BU		BC	BU	C	C	C	14	
2	16	BU		BU		BU	BE	BE	BU	BE	BC	BC	BC	C	C	14	199
2	37					BU	BU	BU	BU		C	N	C	C	C	14	
2	48			BU	BU		BU	BU	BU		BC	C	C	C	C	14	
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3	24	BU		BU		BU	BU	BU	BU		BU	N	N	N	BU		
3	12A	BU		BU		N	N	N	N		N	N	N	N	B?		
3	13	BU		BU		N	N	N	N		N	N	N	N	B?		
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3	49				BU	BU		BU	BU		BU		BU	BU	C	14
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3	73					BE		BU	E		E		BEP	C	C	196
3	97									BU	BU		BC	BC	BU	19
3	25		BE	BE		BE		BU	BU		BU		C	C	N	24
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3	69					BU		BU	BU		BU		BU	BU	BU	
3	113A													C	N	
3	118													C	C	
3	88								BE		BE		BU	BE	C	203
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3	29			BU		BU		BU	BE		E		BU	C	C	
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3	3	BU		BU		BU		BU	BU		BU		BC	BU	BC	
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3	5	BU		BU		BU		BU	BU		BU		BU	BU	BC	
3	11	BU		BU		BU		BU	BU		BU		BU	BU	N	
3	28			BU		BU		BU	BU		BU		BC	C	N	
3	30			BU		BU		BU	E		E		BU	C	N	

3	32	BE	BU		BU		BU	BU		BU	BU		BU	C	N	N	C?	
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3	47				BU	BU		BU		BU	BE		BC	N	N	N	C?	199
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3	114												C	C	C	N	C?	
3	4	E		E		E		E	E		E	E	E	E	E	E	E	
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3	45A								BU		BE	BU	BU	BU	N	N	E?	
3	54A							BU	BU		BE	BU	BU	N	N	N	E?	
3	5A											C	BU	BU	C	N	N	
3	27	BE		BU		BU		BU	E		BC	BU	BC	C	C	N	N	189

B = Adult bird occupying the site with no egg or chick present; E = Egg present, with no adult; EP = Pipping egg; C = Chick present, with no adult; BC = Adult bird with a chick; N = Empty nest site.

Quality codes: Green (1) = Good for observation (can always see contents1); Yellow (2) = Usually can see chick but sometimes only part of chick; Not marked (3) = Possibly good only for incubation because chick could move out of view. May be useful for phenology.

Appendix 2. Locations of least auklet nest sites at the Ulakaia colony, St. George Island in 2007.



Figure 2-1. Locations of least auklet nests at Ulakaia colony, St. George Island, Alaska (#1).

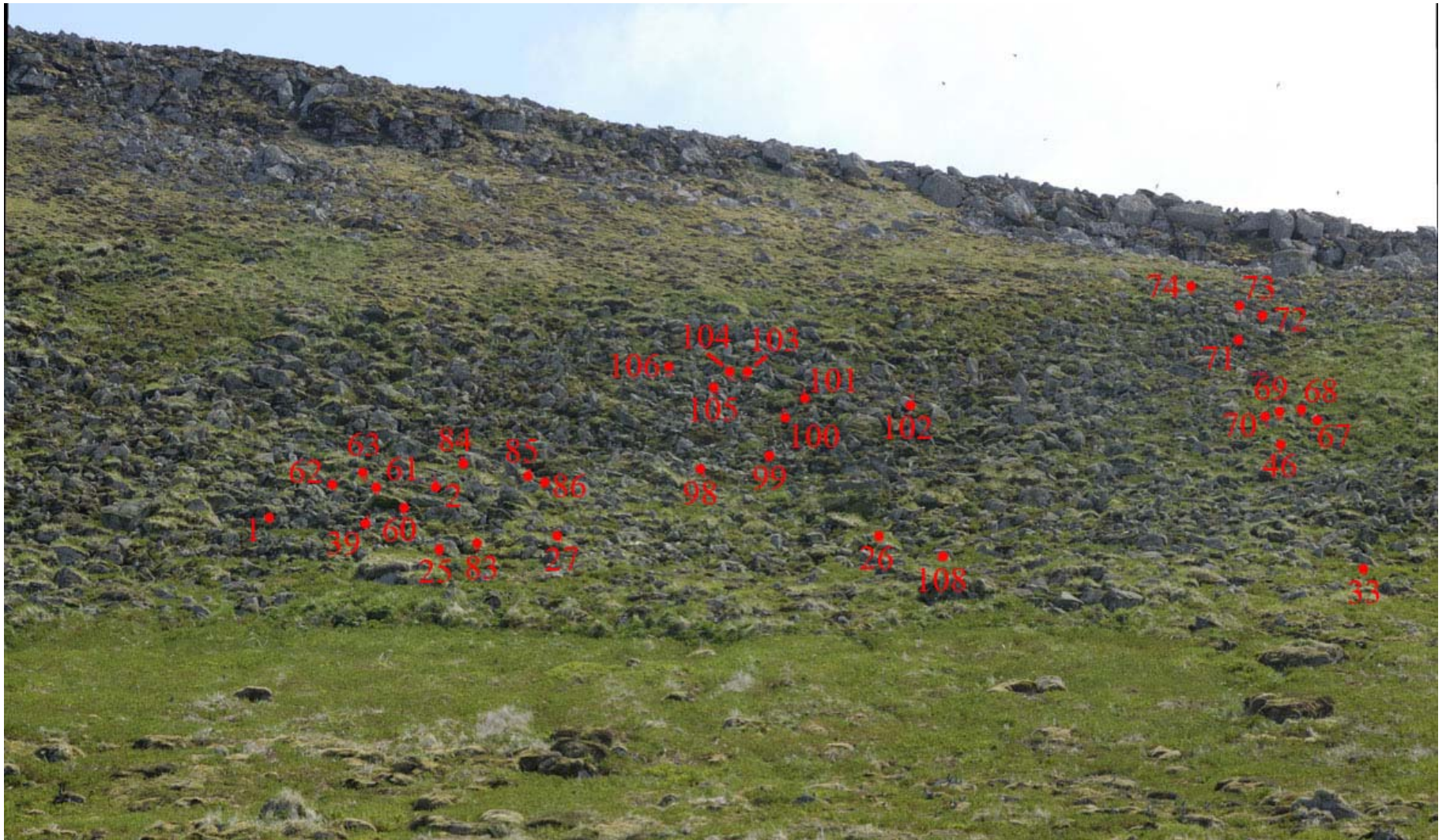


Figure 2-2. Locations of least auklet nests at Ulakaia colony, St. George Island, Alaska (#2).

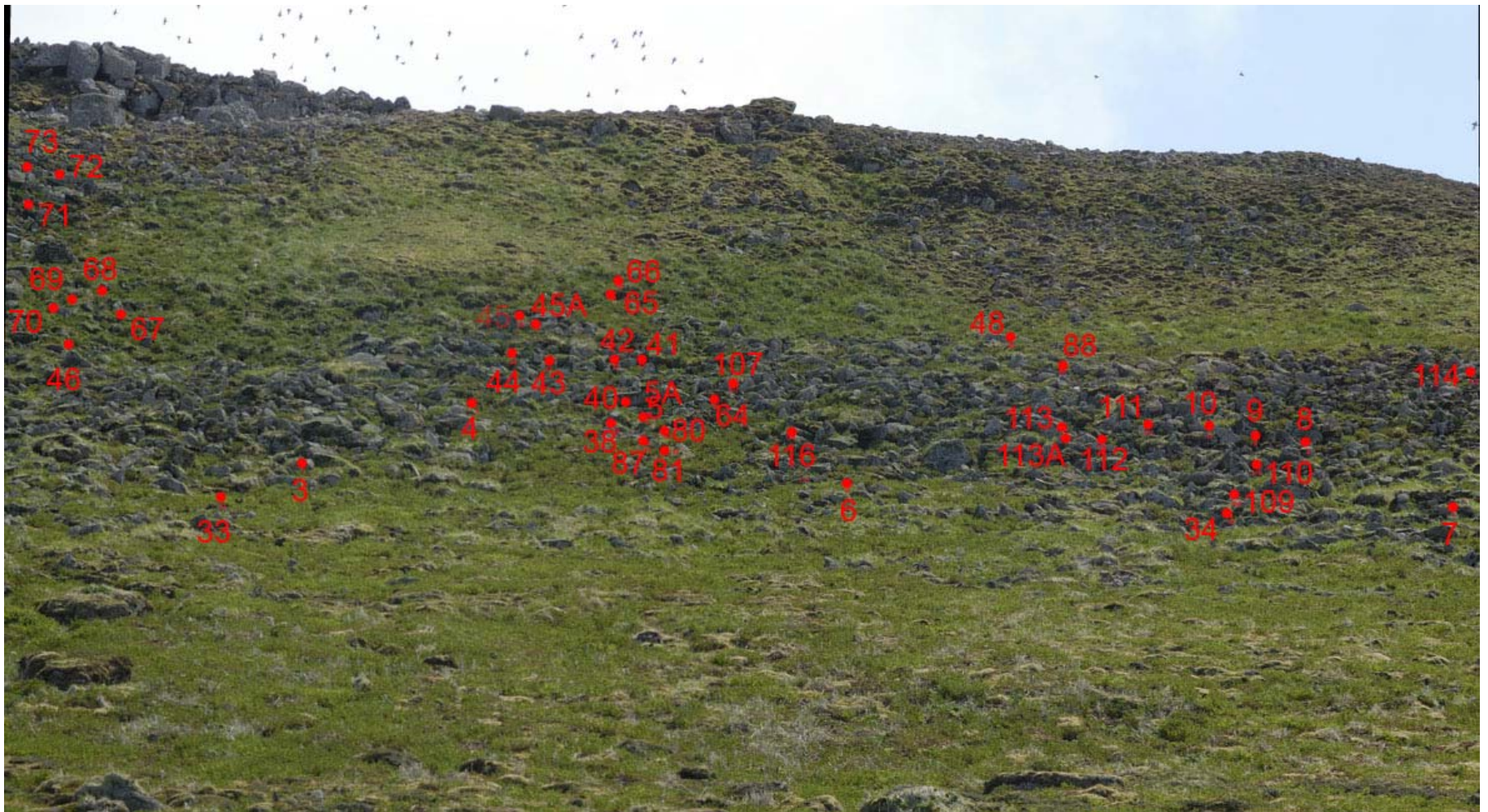


Figure 2-3. Locations of least auklet nests at Ulakaia colony, St. George Island, Alaska (#3).



Figure 2-4. Locations of least auklet nests at Ulakaia colony, St. George Island, Alaska (#4).



Figure 2-5. Locations of least auklet nests at Ulakaia colony, St. George Island, Alaska (#5).



Figure 2-6. Locations of least auklet nests at Ulakaia colony, St. George Island, Alaska (#6).



Figure 2-7. Locations of least auklet nests at Ulakaia colony, St. George Island, Alaska (#7).

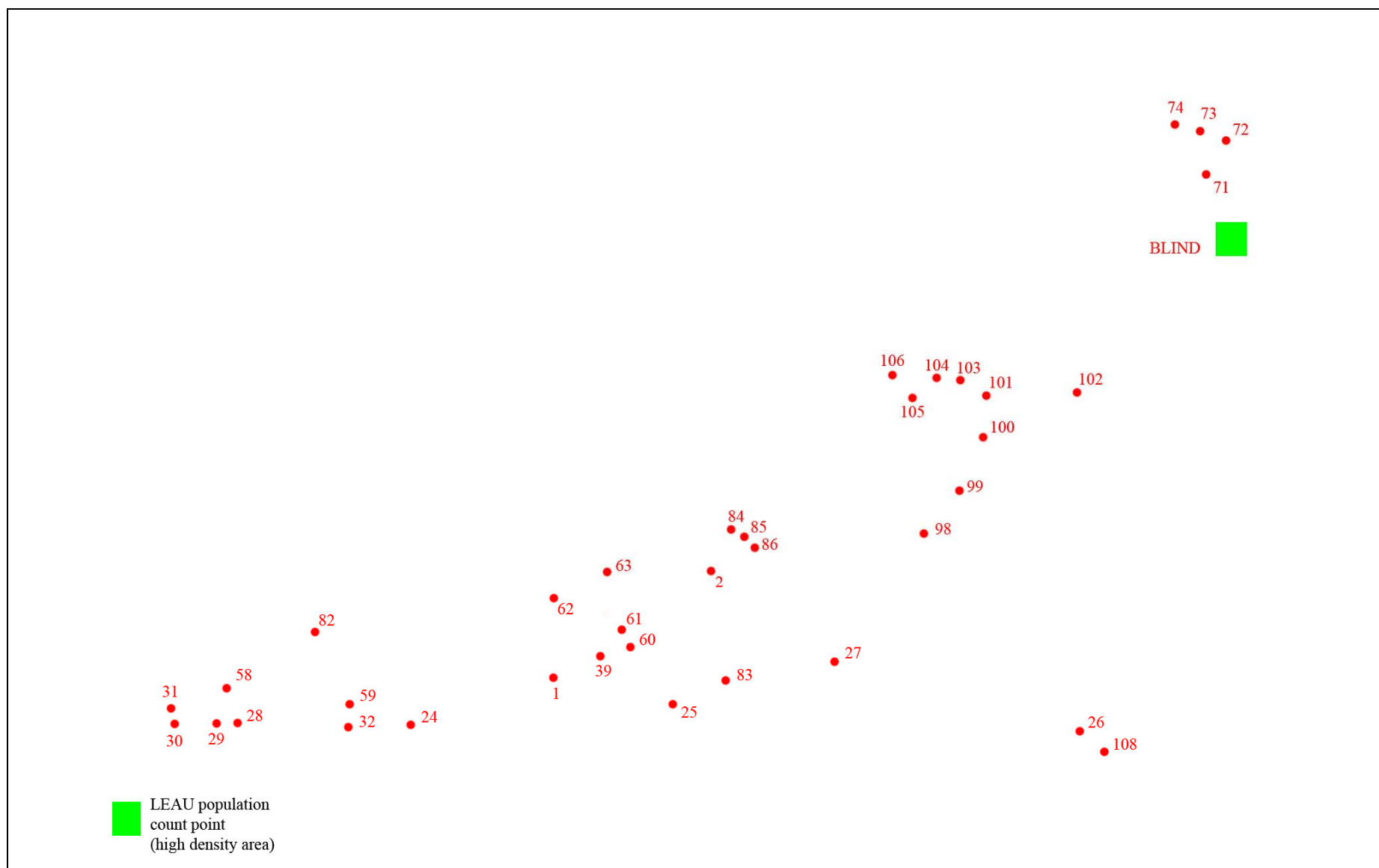


Figure 2-8. Schematic position of least auklet nests at Ulakaia colony, St. George Island, Alaska (#1).

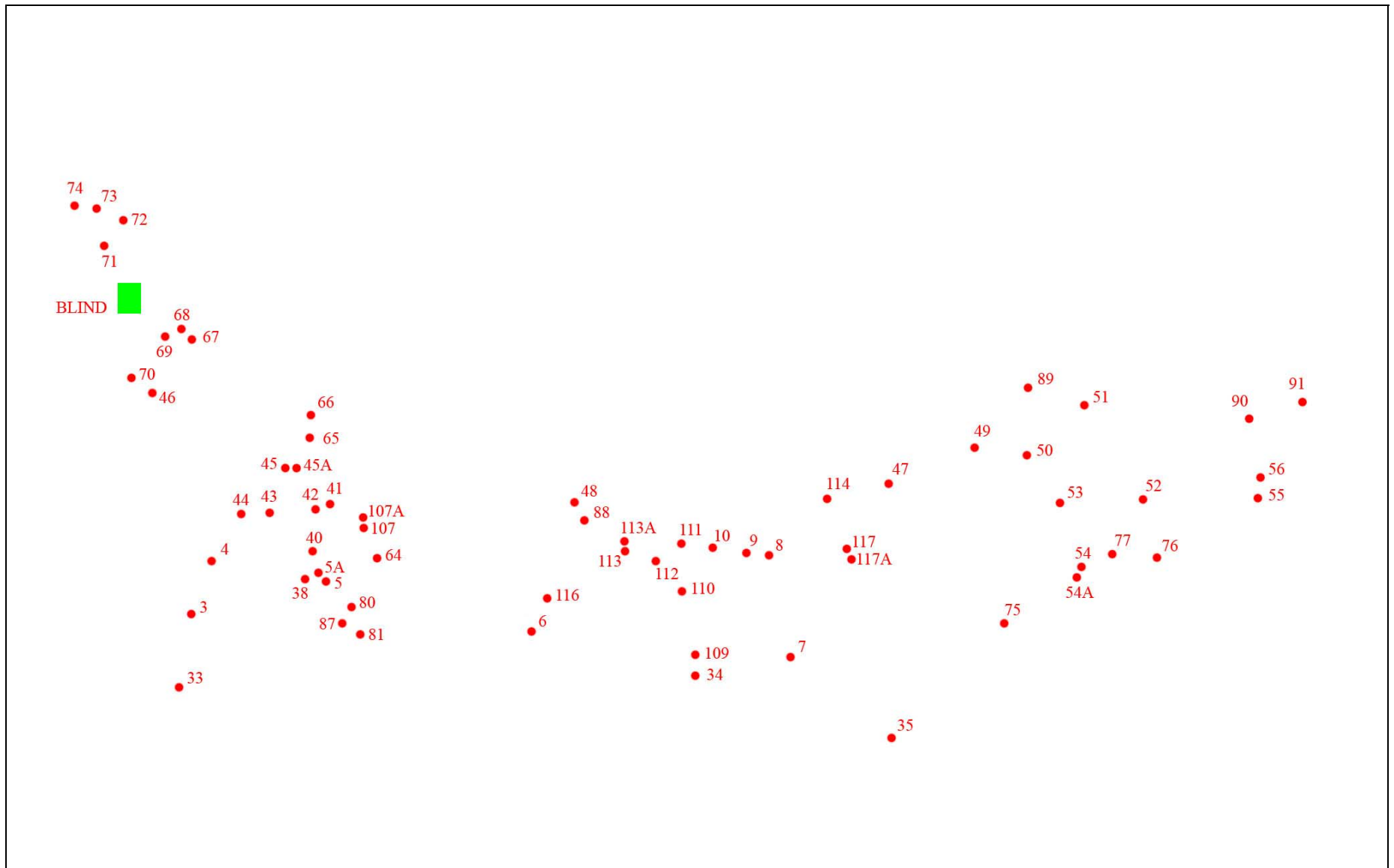


Figure 2-9. Schematic position of least auklet nests at Ulakaia colony, St. George Island, Alaska (#2).

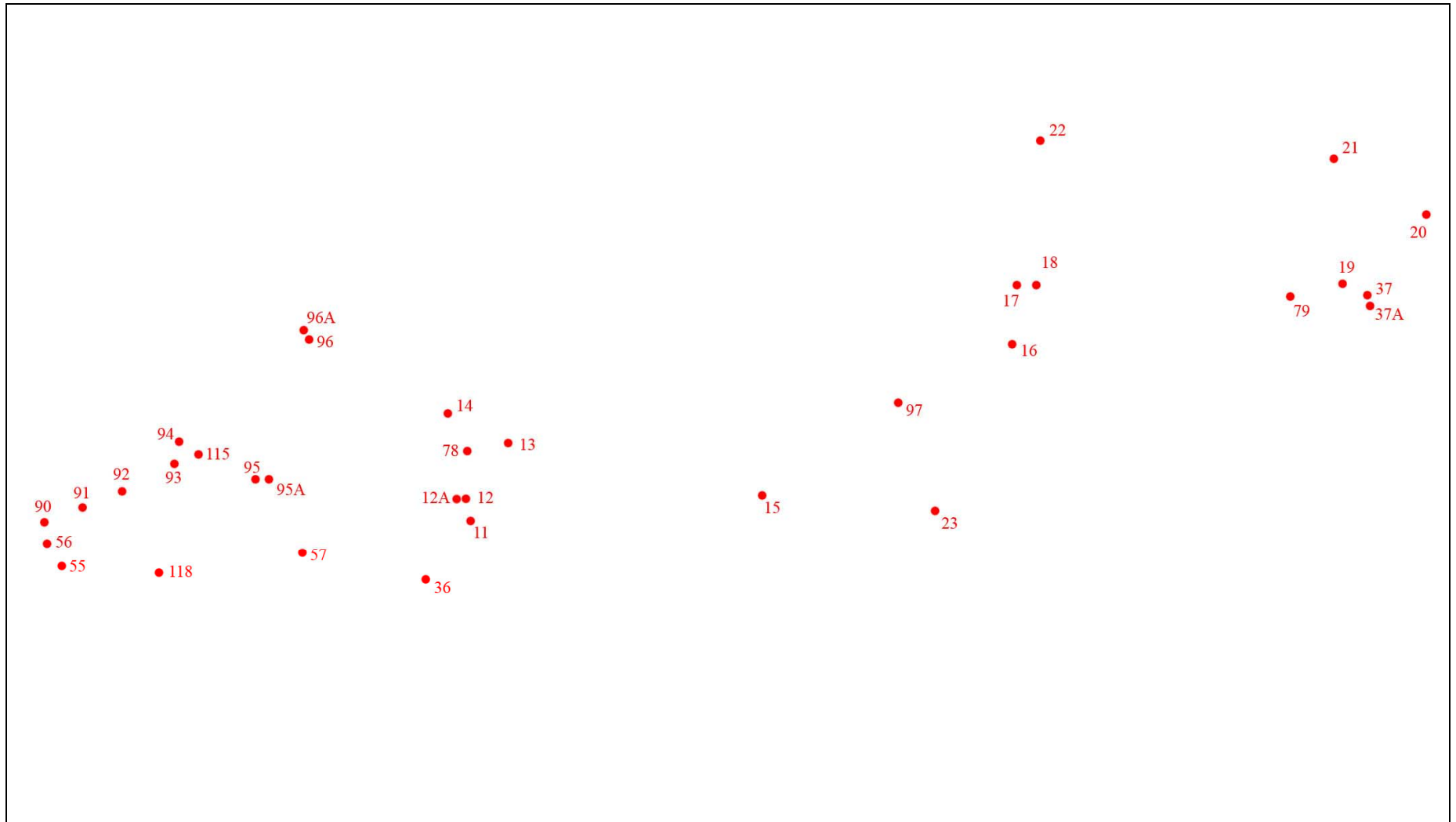


Figure 2-10. Schematic position of least auklet nests at Ulakaia colony, St. George Island, Alaska (#3).