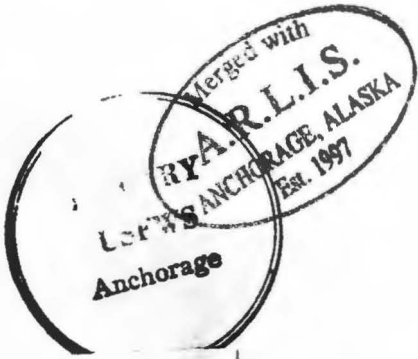


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1980 RAPTOR SURVEY:
THE BREEDING BALD EAGLE POPULATION
AMCHITKA ISLAND, ALASKA.

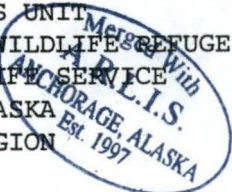


by Patricia J. Heglund and Barry Reiswig

Key Words: Bald eagles
Aleutian Islands
Breeding biology

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INTRODUCTION

In the past, information has been recorded on eagles of the Aleutian Islands by Muri (1959), Krog (1953), Kenyon (1961), and White, Emission and Williamson (1971). During the period of 1967 to 1973, the breeding biology of the bald eagle (Haliaeetus leucocephalus) of Amchitka Island was intensively studied by Sherrod, White and Williamson (1976) and White, Williamson and Emission (1977) under contract to the Atomic Energy Commission (AEC). The primary objectives of these investigations were to accumulate data on the adaptations of bird life on a subarctic tundra island and to provide data necessary for determining human impact on avifauna (White et al., 1977). From 1974 up to the 1980 summer field season, bald eagles had not been studied on Amchitka during which time the human population was reduced from 600 to 6 personnel.

The purpose for the 1980 raptor survey was to determine the number of breeding pairs and to collect nest productivity data. This paper details the extent of all observations and compares portions of data collected during field season 1980 with those collected during previous investigations. Recommendations for future field seasons are also included.

A special note of appreciation goes to YACC enrollees Kevin Brennan and Beth Woytowych for their efforts and observations during the 1980 raptor survey.

METHODS

Due to time constraints and a limited supply of equipment and personnel, all field work was completed in two phases. The objectives for Phase I were to locate and map active eagle nests, gather egg hatching data and collect information on food habits. Observations for Phase I were completed between 22 April and 13 May 1980 using 3 observers on foot. The total amount of time involved 34 days (190 hours).

The objectives for Phase II were to continue collecting information on food habits and record fledging success. Observations for Phase II were conducted between 9 June and 27 June 1980 by a team of two observers, again on foot. The total amount of time involved 9 days (90 hours). A team system was employed due to the strong aggression exhibited by adult eagles with fledging young.

EQUIPMENT

The equipment used by observers for the field season was as follows:

- 3 pairs of binoculars (7 x 35 Bushnell)
- 3 spotting scopes (25x, 35x Bushnell)
- 3 tall bamboo poles
- hard hats
- 3 field record books
- 3 sets of field maps in plastic bags
- first aid kit
- survival blankets (double as rain covers or packs)
- one two/person tent
- one single burner white gas stove
- assorted cooking equipment
- assorted dried meals (44 meals + emergency)
- two sleeping bags

PROCEDURE

During Phase I, observers usually worked individually. Each observer would hike a pre-determined length of coastline approximately 7 to 10 miles per day. Generally observers hiked on the tundra above beaches for better visibility. Observers keyed on the sight of an eagle as well as territorial defense behavior indicating the presence of a nest. All nests containing fresh material were counted. These were considered active nests as described by Sprunt et al (1973). Attempts were made to get as close to the nest as possible and collect information quickly, keeping human impact at a minimum.

Data was collected on: (1) presence or absence of one or more defending adults, (2) location of the nest, (3) distance from high tide, (5) activity (active or not active), (6) visibility of nest interior, (7) presence of new material, (8) presence of eggs or downies, (9) descriptions of food remains, and (10) site description.

In keeping with historical data, nest site types were classified as described by Sherrod et al (1976), with one exception. The types Ridge and Hillside were combined into Ridge. To make our data comparable to those of Sherrod et al (1976) we combined their columns labeled Ridge and Hillside and then recalculated the figures (See table 1). Nest site classifications are as follows:

- sea stack: pinnacles sticking out of the sea which were formed by oceanic erosion of a past peninsulet.
- ridge (ridges and hillsides): peninsulets which are still connected to the mainland or the side of a hill on the mainland around the coastline.
- connected stack: ridges that have been worn away leaving a stack

still joined to the mainland by a lower saddle-shaped arm.

-islet: same as a sea stack but with the width of the top greater than the height to the top.

The southeastern two-thirds of the island, Sections B and C, were surveyed first (see Illustration 1). This enabled two of the observers to condition themselves for the mountainous northwest end and allowed for better traveling conditions influenced by the oncoming summer weather.

- The observers completed an 8 day backpacking trip circumambulating the northwest end. Each day was travelled in deference to the weather conditions unless ground conditions deteriorated to an unsafe standard. The expedition was completed in 7 days.

Illustration 1. 1980 Raptor Survey, Breeding bald eagle nest locations.

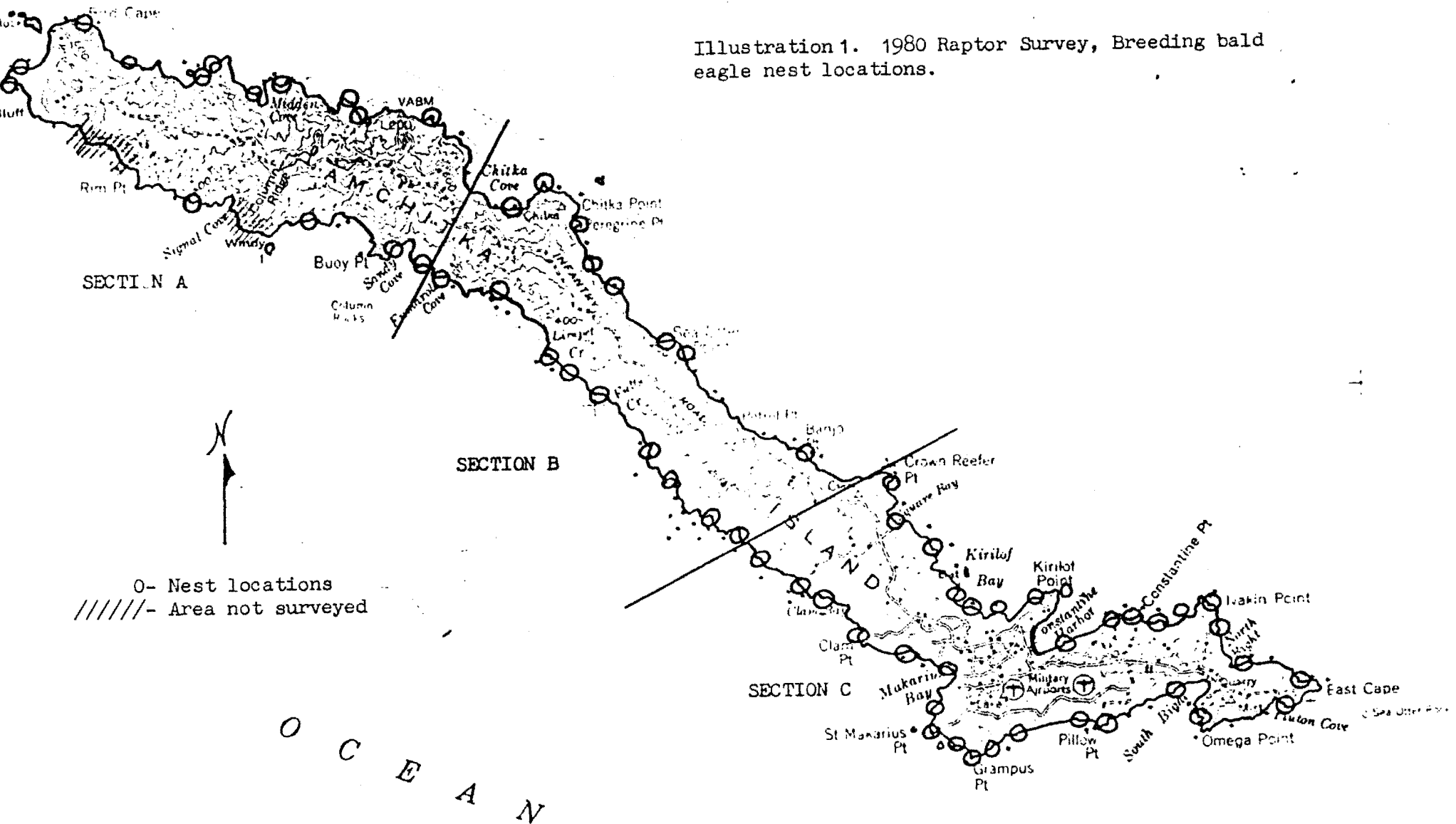


TABLE 1

Division of Bald Eagle Nests According
to Nest Sites for 1969-1972 and 1980

Year Description	Structure					Total
	Sea Stack	Ridge	Connected Stack	Islets	Manmade	
1969 Number of nests	17	17	12	5	0	57
Per cent of all nests	29.82	40.35	21.05	8.77	0	100.00
1970 Number of nests	20	17	10	4	0	56
Per cent of all nests	35.71	39.29	16.07	7.14	0	100.00
1971 Number of nests	28	12	16	4	0	68
Per cent of all nests	41.18	29.41	23.54	5.88	0	100.00
1972 Number of nests	31	12	13	7	1	71
Per cent of all nests	43.66	26.76	18.31	9.86	1.41	100.00
1980 Number of nests	23	22	14	7	0	66
Per cent of all nests	34.85	33.33	21.21	10.60	0	100.00
% Percent of all nests for five years	37.42	33.33	20.44	8.49	.20	100.00

All nests that had visible Phase I data on number of eggs or downies were targets for Phase II. Sections B and C were again completed first. To conserve gas a second camping trip was undertaken for the survey of the northwest end. Circumambulation, however, was not necessary as all nests were approached directly from the road.

WEATHER

Adverse weather conditions, mainly persistent high winds, frequent snow squalls, occasional storms, and dense fog were the major deterrents to observation throughout the field season. (see Table 2). Phase II was not completed due to dense fog which restricted visibility and to the transfer of efforts to a higher priority project.

RESULTS

We ended Phase I having mapped and recorded 66 active eagle nests (see Illustration 1). Table 3 was constructed to compare this number with those collected over a 7 year period by White et al (1977). Approximately 10 miles of coastline were not covered due to the extreme relief of the topography. Comparing 1980 nest locations with those from 1969 and 1972, it is felt that perhaps nests may have been missed (see Illustrations 2, 3, and 4). In addition, none of the large surrounding islets were surveyed where several nests may also have been missed (ie; Bat Island was suspected of having one pair). To support this it is interesting to note that if for 1972 data all nests located on the large surrounding islets were omitted from tabulation, the number of eagle nests on Amchitka was 64.

Two conclusions become evident when looking at the reports of previous investigators. First, the number of breeding pairs on Amchitka is food source dependent, and secondly, nest site location is also largely food source dependent. Support for these conclusions is as follows:

TABLE 2

Table of Climatological Observations
1980

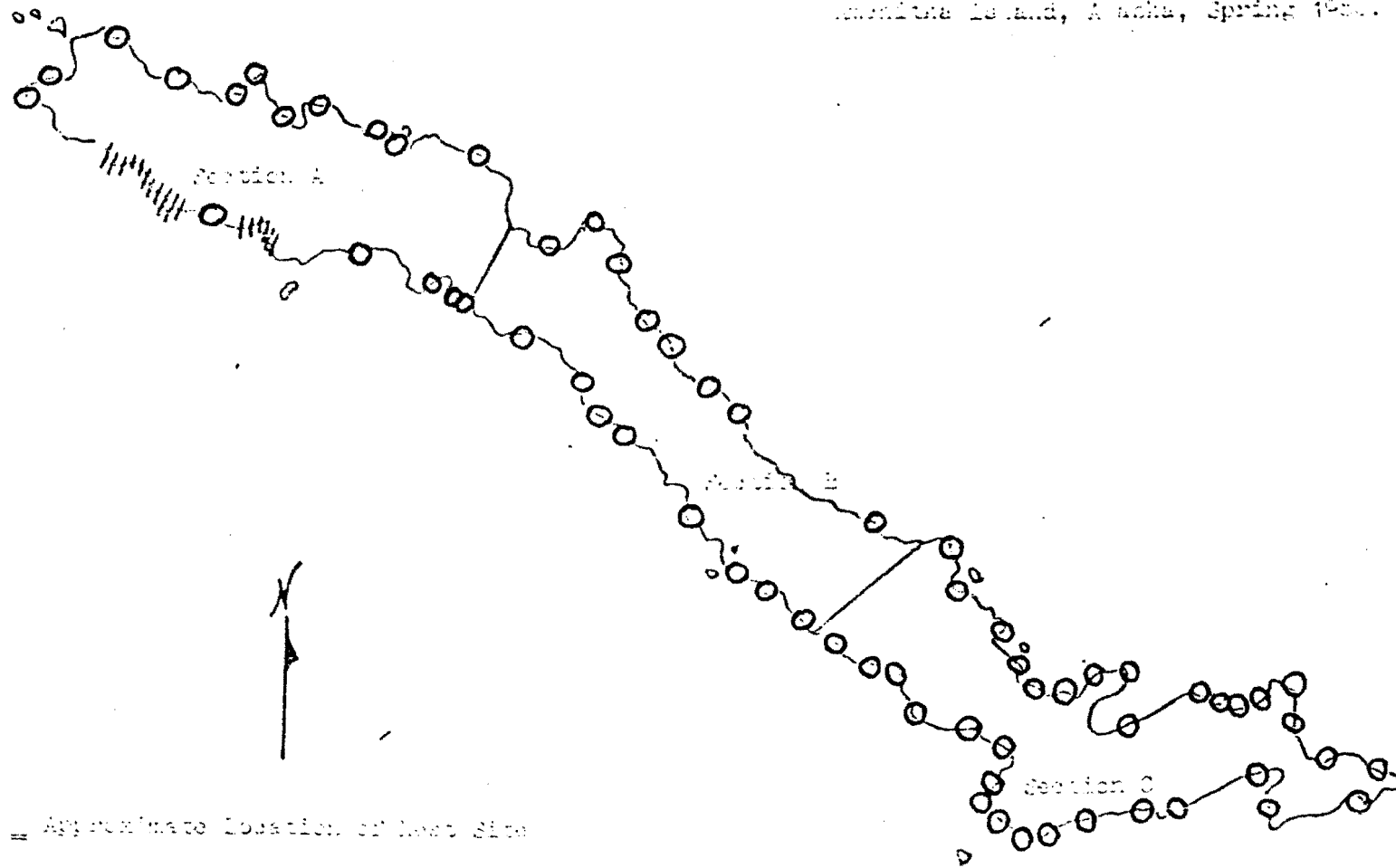
DATE	TEMPERATURE (°F)		WIND SPEED (knots)	FOG	CONDITIONS
	Max	--- Min			
4-22-80	38	30	30 - 50		Snow, visibility 1 mile
4-23-80	38	29	25		Snow squalls
4-24-80	37	29	35 - 45		Snowstorm in afternoon, vis. 1/2 mi
4-25-80	37	30	40 - 50	x	Snowstorm, visibility 1/5 mile
4-26-80	39	28	20		Overcast, precip., visibility 16 mi
4-27-80	41	26	--		Intermittent snow squalls
4-28-80	39	26	25 - 30		Breaking overcast, visibility 55 mi
4-29-80	40	26	20		Breaking overcast, snow squalls
4-30-80	41	27	15		Breaking overcast, visibility 60 mi
5-1-80	40	29	10 - 20		Scattered clouds
5-2-80	40	29	19	x	Heavy overcast
5-3-80	42	31	40	x	Snowstorm
5-4-80	40	32	35	x	Rainstorm
5-5-80	40	28	30 - 35		Scattered clouds
5-6-80	43	33	32 - 40		Overcast, visibility 3 miles
5-7-80	43	33	32		Scattered clouds
5-8-80	44	33	25 - 35		Rain, visibility 15 miles
5-9-80	42	33	30 - 40		Broken overcast
5-10-80	42	33	25 - 30		Overcast, rain
5-11-80	39	33	40 - 45		Overcast
5-12-80	43	33	19		Broken overcast, visibility 30 mi
5-13-80	44	34	21		Broken overcast, visibility 50 mi
6-9-80	45	38	8	x	Broken overcast
6-10-80	44	38	16	x	Overcast, visibility 1/8 mile
6-11-80	45	36	26		Overcast, visibility 60 miles
6-12-80	46	36	20		Scattered clouds
6-13-80	47	40	40	x	Overcast, rain, visibility 1/8 mi
6-14-80	45	39	30	x	Overcast, rain, visibility 1/8 mi
6-15-80	45	35	20		Overcast, visibility 15 miles
6-16-80	43	39	22	x	Overcast, visibility 2 1/2 miles
6-17-80	45	40	18	x	Overcast, visibility 1/4 mile
6-18-80	47	36	30	x	Overcast, visibility 1/8 mile
6-19-80	48	41	35	x	Overcast, rain, visibility 5/16 mi
6-20-80	48	39	15	x	Overcast, visibility 1/8 mile
6-21-80	45	38	20	x	Overcast, visibility 1/8 mile
6-22-80	45	37	10	x	Overcast, visibility 1/8 mile
6-23-80	46	37	10		Overcast, visibility 10 miles
6-24-80	46	38	17 - 19	x	Overcast, visibility 1 mile
6-25-80	46	37	22 - 28	x	Overcast, visibility 1/8 mile
6-26-80	45	36	21	x	Overcast, dense fog
6-27-80	47	42	20	x	Overcast, dense fog

TABLE 3

Nesting Attempts For The Bald Eagles
1968 - 1972, 1974 and 1980

YEAR	NUMBER OF NESTS
1968	40
1969	57
1970	56
1971	68
1972	71
1974	64
1980	66

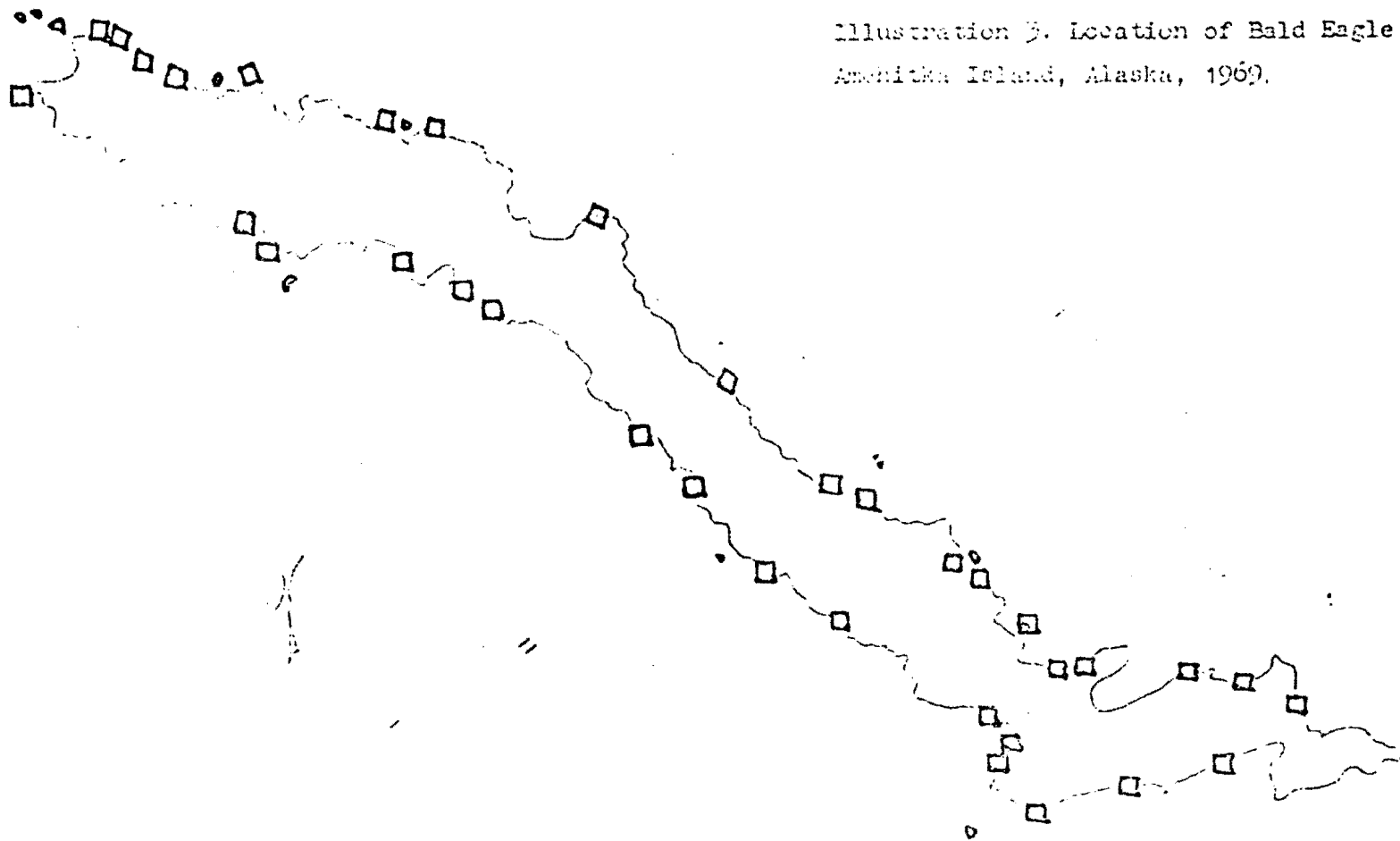
A. A. Curtis, Jr., Section of Bull Earth to the
Mendota Island, A. A. A. A., Spring 1901.



○ = Approximate Location of Lost Site

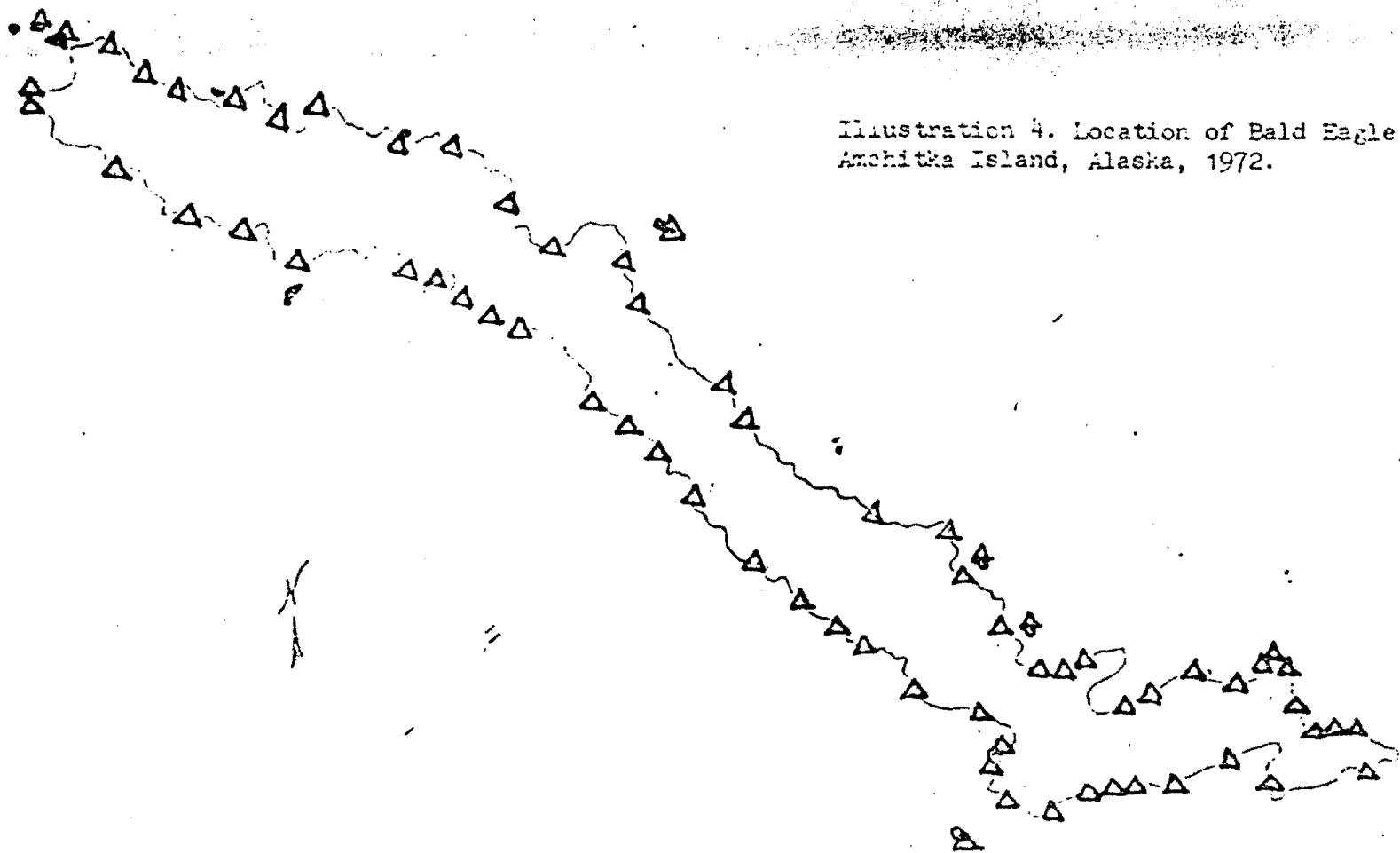
▨ = Areas Not Surveyed

Illustration 3. Location of Bald Eagle Nests
Amnitchka Island, Alaska, 1969.



○ = Approximate Location of Nest Site.

Illustration 4. Location of Bald Eagle Nests
Amchitka Island, Alaska, 1972.



○ = Approximate Location of Nest site.

White et al (1977) and Sherrod et al (1976) found the highest concentration of nests in the southeastern section. They attributed this concentration to the presence of the garbage dump which provided an easy and alternate food source to the natural prey population. White et al (1977) felt nest sites may have been selected in response to the proximity of a locally abundant food source, ie; the garbage dump. It was noted that the use of the dump by adult eagles was limited, while immatures relied heavily on its use. The results of the studies indicated that more immatures were surviving to adulthood, and therefore, were entering the breeding population. It was believed that there was an actual increase in the number of younger eagles attempting to breed between 1970 and 1974. For each year, 1972 and 1974, an immature eagle in the brown-eye stripe phase, (Sherrod et al, 1976) nesting attempt was recorded. Only the 1974 attempt produced young.

It is interesting to note that 3 pairs, each involving one immature of the brown-eye stripe phase were recorded as nesting attempts for 1980. One nest contained one egg, another contained two eggs, and the third contained an unknown number of eggs. The former two nests did not produce young, and the status of the third nest is unknown.

Based on data collected in 1980, it appears that factors other than the dump may influence eagle nest distribution and number of breeding pairs on Amchitka. As shown in Table 4, nests are located in essentially the same areas as in 1972. However, between 1973 and 1980 the human population dropped from 600 to 6 personnel; and consequently, little garbage was available for eagles. Most refuse was burned immediately and eagles were not observed using the dump site.

TABLE 4

Year	Section A (NW)		Section B		Section C (SE)		Total # Nests
	# Nests	% Nests	# Nests	% Nests	# Nests	% Nests	
1972	19	26%	15	22%	37	53%	71
1980	16	23%	16	23%	34	53%	66

It is possible that 60-70 nests may be the saturation point for available nest sites, and food supply may not be the sole limiting factor for the number of eagles in the breeding population. The presence of the dump might have allowed immatures to become more numerous and enter the breeding population at an earlier age, when dump food was available. But then, how do we account for the 3 immature eagles involved in nesting attempts during the 1980 field season 7 years after the dump was closed? For some reason, other than the dump, immatures are surviving and entering the breeding population.

Sherrod *et al.* (1976) recorded three adults in attendance at each of two nests in 1971 and 1972 and at each of three nests in 1974. We recorded three nests with three adults for 1980. One of these nests was returned to during Phase II and was found to have been abandoned. Upon checking the nest interior, two dead eaglets, one fledgling and one downy were found. An unhatched egg was collected. The nest had originally contained 4 eggs but there was no sign of a second eaglet or unhatched egg.

Table 1 shows that sea stacks are historically the preferred nest site. For 1980, we noted an increase in the number of nests located on tundra ridges while the number of nest located on sea stacks decreased. Average nest height was 39.4 feet and average margin from high tide was 11.5 feet. The average distance between eagle nests was calculated assuming 117 miles of coastline around the island. The results are detailed in table 5.

TABLE 5
Average Distance Between Nests

<u>Year</u>	<u>Distance</u>	
	Miles	Kilometers
1969	2.11	3.39
1970	2.14	3.44
1971	1.76	2.83
1972	1.69	2.72
1980	1.77	2.83

PRODUCTION DATA

Table 6 outlines nest productivity for 1980 field season. Of the 66 nests located, 44 visibly contained either eggs or young. The 22 nests that did not have visible interiors therefore have no nesting data recorded. Twenty-six of the active nests were revisited. Of the 26 nests revisited, 18 fledged one to three young, 8 nests were abandoned. The average number of young fledged was 1.04 per nest. Since only a small percentage of nests were revisited we could only obtain an average number of downies per nest containing young and an average number of young fledged per nest fledging young (see Table 7). All values reported are probably higher than actually existed since mortality would occur in some of the earlier observed nests.

Aggression of adults toward observers increased as the chicks grew older, hence the reason for working in teams of two during Phase II. One pair of eagles nesting near Clevenger Beach refined their attack methods throughout the season. Sherrod et al (1976) felt that pairs frequently visited, habituated to the disturbance and shortened their attack time. With the Clevenger Beach pair this was not noted. Although the area was visited biweekly for a beach mammal survey, the adults did not relax their attack until the young had fledged.

FOOD HABITS

Food habit data was recorded during both phases. Little food was spotted during Phase II. This coincides with Sherrod et al (1976) findings that later in the season when the young were larger in size and required more food they rarely found food in nests.

Sherrod et al., (1976) found eggs of other species in the nests of avian predators. He felt the predator had killed and eaten a female about to lay, leaving the egg. During the 1980 field season we observed a glaucous-winged gull (Larus glaucesens) egg in a nest with a fledgling eagle. The egg contained a developed chick. A food list was compiled during the 1980 field season (Table 8).

CONCLUSIONS

From the data presented it appears that the breeding eagle population of Amchitka Island has maintained itself at or near the levels recorded by Sherrod et al. (1976).

The number of personnel on island fell from 600 to 6 between 1973 and 1980. During that time the refuge dump was utilized on a reduced scale and most refuse was burned immediately.

TABLE 6

Bald Eagle Egg Production and Hatching
Success for 1980

Description	No. of Eggs or Young in Nest				Total out of 44 Nests
	One	Two	Three	Four	
Number of nests/eggs	8	7	2	1	18
Number of nests/young	12	13	1	0	26
Number of nests fledging young	10	8	0	0	18
% of nests with 1-4 eggs					27.0%
% of nests with 1-3 downies					39.0%

TABLE 7

Average Number of Young for 1969-1972, 1974 and 1980

Description	1969	1970	1971	1972	1974	1980
Number of young known in nest per nesting attempt	.94	1.27	1.22	1.10	1.15	?
Number of young known in nest per nest containing young*	1.54	1.78	1.73	1.53	1.72	1.58
Number of young fledged per nesting attempt	?	?	?	.86	?	?
Number of young fledged per nest fledging young*	?	?	?	1.42	?	1.48

* Not all nest interiors were visible, therefore our values can be expected to be high

TABLE 8

PREY ITEMS RECORDED IN
BALD EAGLE NESTS

<u>Mammals</u>	<u>Number of Occurences</u>
Norway rat (<u>Rattus norwegicus</u>)	9
Sea otter - pups (<u>Enhydra lutris</u>)	10
Sea otter - adults	1
<u>Birds</u>	
Canada goose (<u>Branta canadensis leucopareia</u>)	2
Green-winged teal (<u>Anas crecca</u>)	2
Common eider (<u>somateria mollissima</u>)	1
Unknown ducks	2
Glaucous-winged gull (<u>Larus glaucescens</u>)	4
<u>Fish</u>	
Unknown fish	12
<u>Misc.</u>	
Glaucous-winged gull egg	1
Orange rope	1
Sandal	2

Previous investigators believed the refuse dump to be a major factor in determining the number of breeding pairs and the distribution of nest sites on Anchitka. Data recorded for the 1980 field season shows that this may not be the case. The distribution of nest sites in 1980 closely resembles that of 1972, with 53% of the nests being located in the south-east. A total of 66 active nests were located and mapped for the island. Three pairs, composed of 1 immature and 1 adult were recorded for nesting attempts.

The majority of nests were located on either sea stacks or on ridges. This shows an increase in the use of ridges as nest sites. The average distance between nests sites appears to be relatively stable at 1.77 nest/mile.

Productivity data was difficult to obtain. This was largely due to our census method. Nests located on sea stacks or islets often had interiors that were not visible or accessible to an observer on foot. However, keeping the small sample size in mind, it appears that nest productivity for 1980 is comparable to that of previous years.

Food habit data are also somewhat sketchy. Nevertheless, information was obtained on the types of food used by eagles early in the breeding season.

Overall, the information collected during the 1980 field season shows the breeding bald eagle population to be stable. It is felt that the refuse dump described by Sherrod et al (1976) and White et al (1977) had little if any impact on the number of breeding eagles or on the distribution of nest sites. If the presence of the dump had allowed immatures to survive past some critical point after which they became successful hunters, we may still be seeing those birds in the breeding population. However, it is more likely that the number and distribution of breeding pairs of bald eagles on Anchitka Island is a result of the topography as it influences the number of potential nest sites. Future investigations should continue monitoring the breeding population to obtain additional trend information.

RECOMMENDATIONS

1. Complete both phases during a one week time frame. Six people could accomplish this.
2. Complete Phase I by the end of April.
3. Complete Phase II by the end of June.
4. Begin both phases at the northwest end to minimize the late spring fog influence. Check Fox Runway for weather conditions prior to departure.

5. Unless the interiors of all nests, can be viewed, statistical analysis and comparison with White's data will be difficult. Perhaps we can draw up our own trend analysis for work we can handle.

- Kenyon, K.W. 1961. Birds of Amchitka Island, Alaska. The Auk. 78 (3): 316-317.
- Krog, J. 1953. Notes on the birds of Amchitka Island, Alaska, The Condor. 55 (6): 299-304
- Murie, O.J. 1959. Fauna of the Aleutian Islands and Alaska Peninsula. U.S. Fish and Wildlife Service. North Am. Fauna No. 61. 364pp.
- Sherrod, S.K., C.M. White and F.S.L. Williamson. 1976. Biology of the bald eagle on Amchitka Island, Alaska. Living Bird. 15: 143-182.
- White, C.M., W.B. Emison and F.S.L. Williamson. 1971. Dynamics of raptor populations on Amchitka Island, Alaska. Bio Science. 21 (12): 623-627.
- White, C.M., F.S.L. Williamson and W.B. Emison, 1977. Avifaunal Investigations. In The Environment of Amchitka Island, Alaska. Ed. M.L. Merriitt and R.G. Fuller. Publ. Technical Information Center Energy Research and Development Administration. pp.227-260.

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