

KODIAK-Biological Reconnaissance
burris (Pictures)

US FISH & WILDLIFE SERVICE--ALASKA
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ALASKA WILDLIFE STOCKING, KODIAK
ISLAND, BIOLOGICAL RECONNAISSANCE
REPORT.

BY

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**BIOLOGICAL RECONNAISSANCE REPORT
FEDERAL AID IN WILDLIFE RESTORATION**

US FISH & WILDLIFE SERVICE--ALASKA



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STATE: Alaska

PROJECT NO.: W-11-D

TITLE: Alaska Wildlife Stocking

TITLE: Kodiak Island Sheep Transplant

TITLE: Biological Reconnaissance

Report

Proposed Habitat

1. Habitat type: Island Kodiak Archipelago.
2. Approximate area in square miles: 82.6.
3. Approximate boundaries: Mountains and plateau between the Uganik River and the river draining into Spiridon Bay (See enclosed map, Area 4). This is the area the nucleus herd is expected to occupy. Subsequent populations will disperse to adjacent areas.
4. Effective habitat: 80%.

Physical Characteristics

1. Topography: North end is mountainous with steep slopes of 40 to 50 percent and elevation from 1,500 to 5,317. The central portion is a plateau like area with maximum elevations of 2,500 to 3,000 feet. Slopes along the top portion above 1,500 feet are about 10 to 12 percent. The topography is very irregular with many small lakes and knolls. The topography of the southern end is similar to the central portion, except the extreme south end increases in elevation to 4,280 feet with steep slopes and glaciers in the higher elevations.
2. Elevation: 1,500-4,280 feet.

Vegetative Characteristics

1. Alpine vegetation persists above 1,500 feet, and is composed of grass (bluejoint, hairgrass, and sedge), forbs (miscellaneous annuals, fireweed, horsetails, fern geranium, sweet-anise and burnet), and shrubs (mountain alder, rose, salmonberry and willow).

The percentage composition varies with the exposure and drainage. The soil survey series, 1956, No. 17, lists grasses, 15%, forbs, 74%, and shrubs, 11%.

2. Shrubs: Shrub cover below 1,500 feet is predominantly alder.

3. Barrens: Percent of barrens is not known, but the steep slopes of the north and south ends must be primarily exposed rock.

4. A survey of the snow-free areas was attempted on March 23. However, the observer was unable to gain access to the area. An alternate area was selected near Terror Bay. The area was similar in topography and elevation. Photographs No. 19, 20, and 21, Pages 17 and 18, illustrate the similarity of the two areas.

Samples of the forage were collected, and close-up photographs were taken. Examination of the forage samples indicated that the majority of the plants were acceptable to sheep. The survey indicated that the quantity of forage, not quality, would probably be the most important factor affecting the outcome of the transplant.

Climatic Characteristics

1. Average temperature and precipitation: Table one.

2. Snow conditions: Late winter is the critical period for game throughout Alaska. It was anticipated that the critical period for sheep on Kodiak would also be in late winter when snow accumulation would be greatest.

A reconnaissance flight of the island was made in October to select sites which would appear to satisfy the topographical requirements of dall sheep, i.e., sufficient precipitous areas to provide escape cover and suitable flats and sedge meadow areas for loafing and feeding. The sites considered satisfactory were indicated on a map and revisited in late March when it was assumed that snow accumulation would be near maximum. As can be seen in the accompanying photographs, most of the areas were eliminated from consideration because of the obvious heavy snow accumulation on all but the severest of slopes.

Area No. 4 was observed to contain more snow-free areas in which the sheep could forage during periods of heavy snowfall. Actual determinations of the amount of exposed area were not attempted because comparable information from optimum sheep range was not available. The photographs of area 4 on pages 14, 15, and 16, demonstrate the amount of exposed area.

The weather data for the winter months preceding the snow observations made on March 23 was compared with the average and the extreme conditions recorded at the Ugashik Bay approximately five miles from the North end of area No. 4 in order to determine what snow

Table 1

AVERAGE TEMPERATURE AND PRECIPITATION FOR
UGANIK BAY, KODIAK ISLAND

Temperature			Precipitation		
Month	Average	No. of years on which data is based	Average	Maximum	No. of years on which data is based
Jan.	30.0	13	4.21	11.22	12
Feb.	30.6	13	3.18	9.06	13
Mar.	31.3	13	2.62	6.45	13
Apr.	37.0	12	3.49	8.25	12
May	44.5	8	2.97	5.27	9
June	52.3	10	1.76	5.24	10
July	55.6	9	2.12	4.84	11
Aug.	56.6	5	2.06	*4.29	7
Sept.	48.5	10	3.79	6.93	8
Oct.	39.8	12	6.75	14.06	12
Nov.	32.5	12	5.68	14.95	12
Dec.	29.3	11	5.93	14.10	11

*Ten days' data were missing from this month.

conditions could be expected on the release site provided a relationship exists between the weather conditions at both locations. In order to compare the data and provide application to the release site, several allowances must be made; however, without accurate weather information from the release site, the validity of the allowances may be questioned. It would not seem reasonable to compare the snowfall at sea level to the snowfall at elevations exceeding 2,000 feet. A more direct relationship would probably exist between the precipitation rates than the relationship between the snow and sleet fall. Observations made on October 16, 1963, indicated that snow had begun to accumulate at elevations above 2,000 feet. Therefore, for the purpose of this report, it was assumed that all precipitation falling on the proposed release area after October 1 would remain on the site as accumulated snow until thawing in the spring. An examination of the average maximum, average minimum, and average temperatures for October contained in Table 1 would indicate that very likely in some years little snow accumulation would occur during the first portion of October. However, any error introduced by this would be offset by the probability much of the April precipitation would be snow because of low temperatures.

A long-term climatological study of the immediate area would be necessary to determine the maximum snow accumulation, and to evaluate the possible effects the accumulation may have on sheep. In lieu of this, the snow conditions for the 1963-64 season were observed and photographed, and the Uganik Bay precipitation from October through March was then compared with all of the Uganik Bay weather data to compare the observed snow fall. The premise was made that if the precipitation recorded from October 1, 1963, to March 31, 1964, was near maximum, then the snow accumulation on the release site would also be near maximum. Conversely, if the precipitation was comparable with the minimum precipitation, then considerably more snow could be expected during years of maximum precipitation.

The comparisons in Table 2 of the total precipitation indicate that the precipitation was greater than the average expected for that period, and was the third highest year recorded. The maximum precipitation recorded was in the period 1959 and 1960 when the total precipitation was 34.42 inches, 15.31 inches greater than the precipitation recorded for the same comparable period in 1963 and 1964. If the relationship is proportional, as previously presumed, then the observed snow cover represents only 72 percent of the maximum recorded snowfall.

The average temperatures were examined from October 1, 1963, through March 31, 1964, and compared with the averages from the Uganik

Table 2

COMPARISON OF UGAWIK BAY PRECIPITATION

<u>Period</u>	<u>Total inches of precipitation</u>
October 1, 1952 to March 31, 1953	30.38
October 1, 1953 to March 31, 1954	16.19
October 1, 1954 to March 31, 1955	23.92
October 1, 1955 to March 31, 1956	13.43
October 1, 1956 to March 31, 1957	14.92
October 1, 1957 to March 31, 1958	23.20 ¹
October 1, 1958 to March 31, 1959	22.04 ¹
October 1, 1959 to March 31, 1960	<u>54.42</u> Maximum recorded
October 1, 1960 to March 31, 1961	42.23
October 1, 1961 to March 31, 1962	20.60
October 1, 1962 to March 31, 1963	35.78
October 1, 1963 to March 31, 1964	<u>39.11</u> Period observed

- 1 One month precipitation is missing. If maximum amount recorded for the period 1952 to 1963 is inserted, the adjusted total remains less than the maximum recorded from October 1, 1959, through March 31, 1960.

Bay weather station to determine if unseasonably warm or cold temperatures had possibly caused an unusual accumulation of snow. The comparison of the average daily maximum temperature, average daily minimum temperature, and the average mean temperatures in Table 3 indicate that November was noticeably colder, December was noticeably warmer, and the average temperatures for the period were very close to the long range average.

Because the temperatures were not unusual, the snow conditions observed on the release site are probably representative of the precipitation rate, i.e., no excessive melting or excessive snow depth due to lack of melting. An attempt was made to evaluate the physical properties of the snow as they existed on the release site. It proved impractical to gain access to the proposed release site, and an alternate site with similar exposure, elevation, and topographic features was visited. It was anticipated that similar snow and vegetative conditions would exist on the alternate site.

The alternate site is indicated on Map No. 1 in order to demonstrate the proximity to the proposed release site. The photographs on Pages 14-18 show the similarity between the alternate site and the proposed release site. The snow cover on the alternate site was dense and granular. A crust persisted over almost the entire area. The crust was sufficient to support the weight of the observer. Only on the leeward side of abrupt rock outcroppings or stands of brush was the crust insufficient to support the observer's weight. Photographs No. 22, 23, and 24, pages 18 and 19, show the crusting condition of the snow around the exposed knolls.

Animal Abundance and General Conditions

1. Resident species.

Game Birds--rock and willow ptarmigan.

Game Mammals--black-tailed deer, brown bear, snowshoe hare, mountain goat, and reindeer (reindeer, mountain goat, and deer do not occur on the area indicated on the map)

Predatory mammals--Possibly brown bear.

Predatory birds--none.

Domestic species--none.

2. Habitat changes--none.

TEMPERATURE COMPARISON

AVERAGE DAILY MAXIMUMAVERAGE DAILY MINIMUMAVERAGE MONTHLY MEAN

	Sample period*	Station Average	Deviation from station average		Sample period	Station Average	Deviation From station average		Sample period	Station Average	Deviation from station average
Oct.	47.4	47.2	+0.2		32.7	33.0	-0.3		40.1	39.8	+0.3
Nov.	35.1	39.9	-4.8		19.5	27.9	-8.4		27.3	32.5	-5.2
Dec.	40.6	34.3	+6.3		30.7	22.8	+7.9		35.7	29.3	+6.4
Jan.	35.7	35.0	-0.1		25.3	24.6	+0.7		30.5	30.0	+0.5
Feb.	37.5	37.2	+0.4		23.7	24.0	-0.3		30.4	30.6	-0.2
Mar.	36.4	38.5	-0.1		23.2	24.3	-1.1		30.1	31.3	-0.2

3. Relative hunting pressure.

Game Birds--none.

Game Mammals--light.

4. Foreseeable trends in land utilization: some recreational hunting.

5. Accessibility: The release site can be reached by boat from the south arm or east arm of Uganik Bay. There are several small lakes in the vicinity of the release site which would provide suitable landing spots for two-place float planes. The accessibility of the individual animal would be difficult in this terrain, as it is in any of the terrain occupied by dall sheep.

Wildlife Species Affected

The introduction of dall sheep on Kodiak should cause as little conflict as possible. No ungulates exist on the area where the sheep will be released. Goats occur on the southwest side of the island, and deer occur on the same side of the island where the sheep will be released, but exist three bays to the north. If the sheep, goat, and deer populations were to expand, it is very unlikely to result in conflict or competition between the species even if the three species occurred on the same area.

Grizzly and brown bear are common throughout the range of the dall sheep. The brown bear on Kodiak are not expected to affect the establishment of sheep populations.

Proposed Area Management

The area the sheep are expected to occupy will be almost entirely within the Kodiak National Wildlife Refuge. A cooperative agreement between the Bureau of Sport Fisheries and Wildlife Refuge Branch and the Alaska Department of Fish and Game provides for the orderly harvest of any annual surplus and legal access to the refuge for the purpose of harvesting the animals.

Regulations to provide for the maximum utilization for recreational and other purposes will be promulgated in accordance with Federal Aid Regulation 163.4 as soon as there is a harvestable surplus.

Evaluation of Release Sites

A reconnaissance flight of Kodiak Island was made on October 16, 1963. Seven areas which appeared to have the greatest potential

for sheep range were identified and recorded on a map of the island. No consideration was made of how sheep could be placed in these areas or if sheep could be harvested from the areas if a transplant were successful. A second reconnaissance flight was planned for the late winter period when the snow accumulation on the island would be the greatest. It had been anticipated that the precipitation or the resulting snow conditions on Kodiak would be the limiting factor to establishing a sheep population. The purpose of the flight was to determine which of the 7 areas contained suitable snow-free areas in which a sheep population could winter.

Prior to the advent of the late winter reconnaissance, Alaska Department of Fish and Game biologist, Harry Merriam, had occasion to visit the areas of Center Mountain and the Chiniak Peninsula. His observations indicated that suitable forage conditions existed for sheep in the Alpine and subalpine portions of these areas. As a result of these observations, three other areas were included on the winter reconnaissance survey. Area No. 8 between Kiliuda Bay and Ugak Bay, Area No. 9 between Ugak Bay and Chiniak Bay, and Area No. 10 Sharatin Mountain, Pyramid Mountain, and the Devil's Ponds which are adjacent to the town of Kodiak and Kodiak Naval Air Station. The ten areas were observed on March 23, and the results and conclusions are as follows:

Area 1: This area located between Kizhuyak Bay and Sharatin Bay was eliminated from consideration due to excessive snow accumulation. Photographs No. 1 and 2, Page 11.

Area 2: Area No. 2 was eliminated from consideration because of the limited amount of area and the heavy accumulation of snow. Photographs No. 3 and 4, indicate that Area No. 2 contains more snow-free area than Area No. 1, although a continuous snow cover persisted on all but the steepest slopes.

Area 3: An almost continuous snowcover was present on Area 3, (Photographs 5 and 6, page 12).

Area 4: Area No. 4 contained the most extensive exposed areas which appeared to contain sheep forage. Photographs No. 7 through 16, Pages 12 through 16 illustrate the amount of snow-free area and diversity of the topography.

Area 5: The south end of Area No. 5 was very similar to the central portion of Area No. 4. However, the area was eliminated from consideration because it is isolated from the other mountainous areas of Kodiak. Sheep populations could not disperse to other suitable areas, also amount of snow-free area was less than Area 4. (Photographs 27-30, Page 21).

Area 6: This area was very similar to Area No. 4, but was smaller and contained less snow-free area. (Photographs 31-33, Page 22.)

Area 7: Area No. 7 was more precipitous than the other areas. The steepest slopes were snow-free, but not expected to support suitable sheep forage. Snow-free areas of favorable topography were limited. (Photographs 34-37, Pages 23 and 24).

Area 8: Area No. 8 had an almost continuous snowcover. (Photographs 38 and 39, Page 25).

Area 9: Chiniak Peninsula was considerably different than the other areas examined as can be seen in the photographs on Pages 26 and 27. The areas below 1,000 feet were essentially snow free. The snow depth increased toward the higher elevations, but some exposed areas persisted. It has been suggested that Dall sheep in the absence of predators may deviate from their normal behavior and descend to lower elevations in order to seek forage in snow-free areas. If this assumption were correct, then an area such as the Chiniak Peninsula would be capable of supporting sheep on a year-around basis. The area was eliminated as a potential release site because the high deer population migrates downward in winter, and the same area supports the main portion of the Kodiak cattle industry. With both deer and cattle presently utilizing winter ranges, it is unlikely that dall sheep could be supported on the same range.

Area 10: The mountainous area adjacent to the town of Kodiak contains some snow-free areas, but the area is too small.

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1. North side of
Area 1.



2. Elbow Mountain,
Area 1.



3. Area 2 south of
Kizhuyak Bay.



4. Area 2, south side.



5. North side of Area 3.



6. Northeast end of Area 3.



7. Northeast side of Area 4.



8. Center portion of Area 4.



9. North end of
Area 4.



10. Southwest portion
of Area 4.



11. South end of Area 4
adjoining Uganik
River.

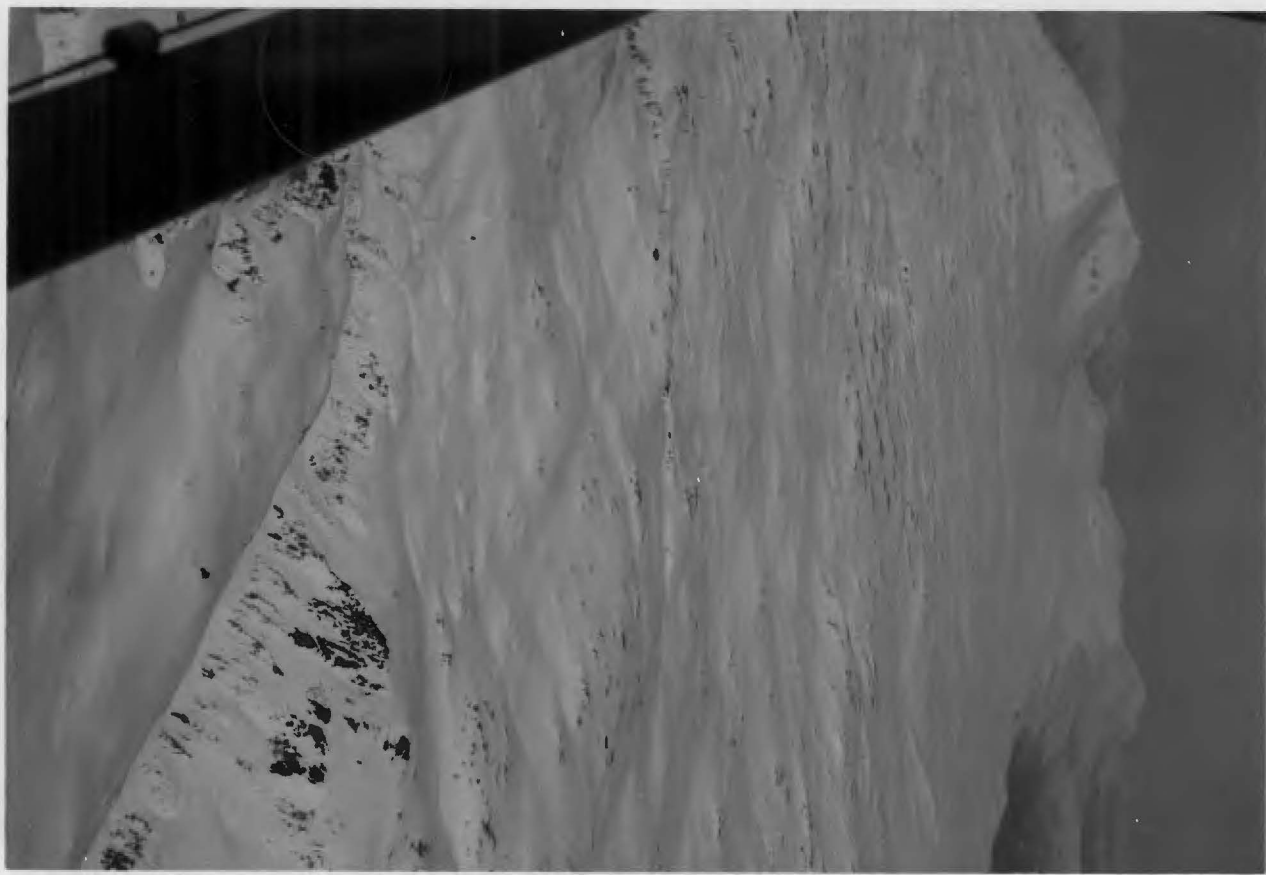


12. Center portion, Area 4
(background).



13. Southwest side
of Area 4.

14. Southwest side of
Area 4.



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15. Central portion, Area 4.

16. Close-up of Central portion, Area 4.



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17. Close-up of Central portion, Area 4.

18. Close-up of Central portion, Area 4.



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19. Alternate sample area.

20. Alternate sample area.



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21. Ground view, alternate sample area.

22. Forage sample site in alternate sample area.



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23. Crowberry lichen complex showing crystalline quality of the snow.

24. Calamagrostis community on alternate sample area.



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25. Exposed knoll, alternate sample area.

26. Plant communities on exposed knoll alternate sample area



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27. West side of Area 5.



28. South end of Area 5.



29. South end of Area 5
overlooking Telrod Cove.



30. Exposed knolls south end
of Area 5.



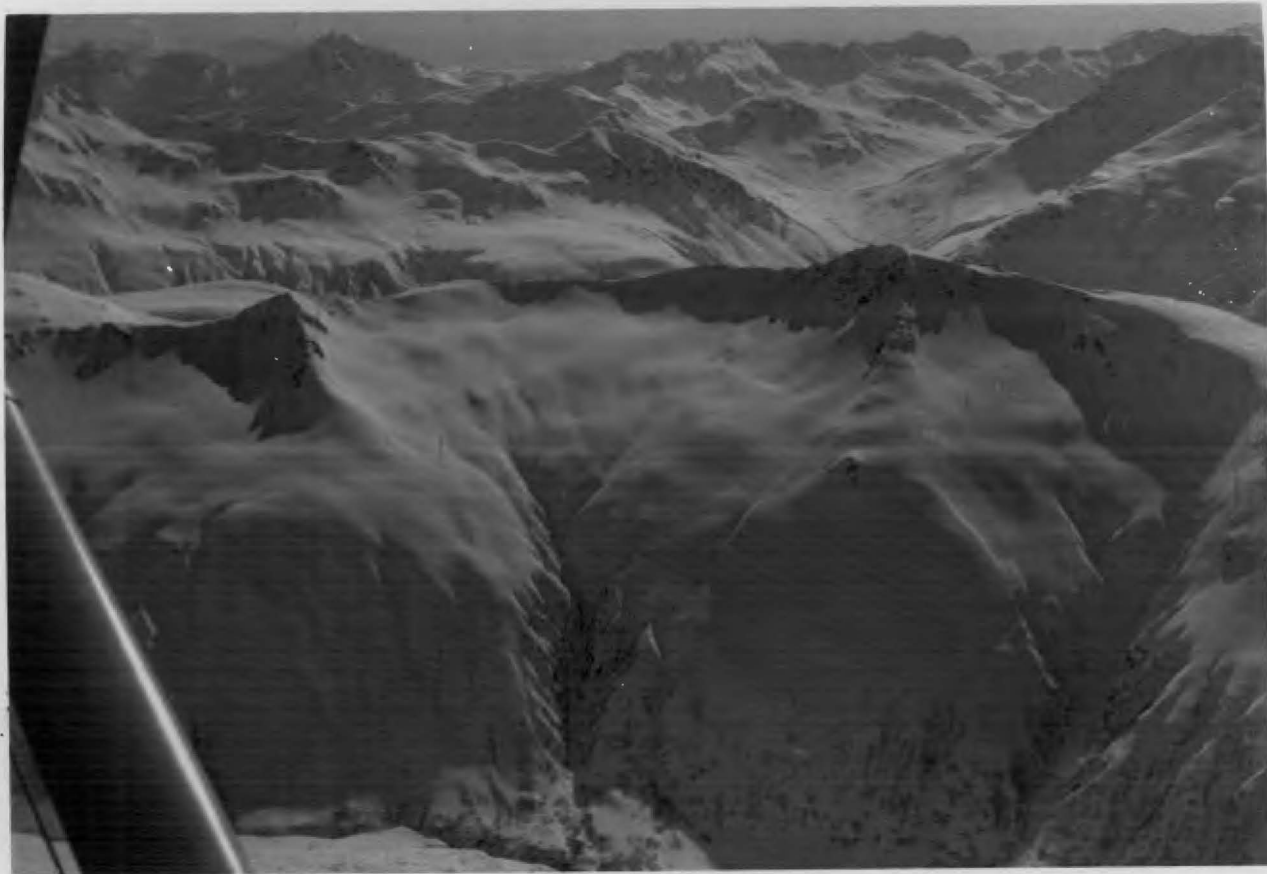
31. South end of Area 6.



32. Northeast side of Area 6.



33. South end of Area 6.



35. Area 7 between Uyak Bay and headwaters of Zachar River.

34. Area 7 between Uyak and Deadman Bays.



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36. Area 7 between Uyak Bay and headwaters of Zachar River.

37. Area 7 adjacent to east shore of Uyak Bay.



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38. Area 8, Shearwater Peninsula.

39. Area 8 vicinity of Eagle Harbor.



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40. Area 9, Lake Rose Tead area.

41. Area 9, Boyer Peak.



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42. Area 9, Marin Range.

43. Area 9, Marin Range.



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MAP # 1.

Area 4.

Library
U.S. National Archives
1011 North 3rd Street
Washington, D.C. 20540



MAP # 2.

Showing areas 1 thru 10.
Alternate Sample Area

Library
U.S. Fish & Wildlife Service
1011 E. Tudor Road
Anchorage, Alaska 99503

