

1987 BIRD SURVEYS OF ANIAKCHAK CALDERA
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INTRODUCTION:

As one member of a five person research team, I studied the avifauna inside the Aniakchak Caldera from July 8 to July 27, 1987. We set up base camp in a cove along the southwest shore of Surprise Lake from which we made daily forays. Initial explorations took us to Surprise Lake's marshy inlet, coves along the southwest shore, rocky ridges above the coves, spatter cones, beach-rye grass dunes along the shore of the Surprise Lake outlet, and the Gates area where the Aniakchak River leaves the caldera. These readily accessible areas formed the main study area for the research team. Within the study area we defined five distinct habitat types: 1-marsh, 2-Gates, 3-coves, 4-beach-rye grass dunes, and 5-non-vegetated areas. In the marsh and Gates area, we found the most abundant and diverse bird life. Later explorations included hikes across the caldera floor. Towards the end of our stay, a U.S. Fish and Wildlife team with a boat extended our access to the east shore of Surprise Lake.

One of the main objectives of the study was reconnaissance. By exploring the caldera extensively, we could compose a list of all bird species observed to be present. Another objective of the study was to find evidence of nesting activity in order to identify which species were breeding. A third objective was to understand the relative abundance of all observed species.

During the study, an effort was made to learn which species were associated with each habitat type. Relative abundance was determined by the percentage of encounters with a given species on outings within all of the different habitat types. An outing was defined as one hour or more spent afield in any direction from the base camp. Almost all of the time spent in the caldera was associated with an outing, but no provision was made for visiting each habitat type for an equal amount of time. Vast areas of the caldera contained no bird life whatsoever. The data collected from the 1987 study are biased by the fact that more time was spent in areas of greatest bird abundance and diversity. However, the estimates obtained from this data can serve as a preliminary information that can be expanded upon by future research.

Several limiting factors made our objectives realistic. The greatest limitation was time. The short length of our stay provided only a snapshot of the life of birds in the caldera. By no means comprehensive, the species list simply reflects the three week period of the trip albeit in the midst of the breeding season. So far, it is the most inclusive list for the caldera.

We arrived with the breeding season well under way and left before it was over. Interspecific differences suggest variable visibility at different times during the breeding season. Ideally, one could arrive shortly after the birds arrive and stay

until nesting is complete.

Attempts to estimate density met with no success. Using a modified belt-transect method, I set up transects in four of the five described habitat types. The transects were fifty meters wide and up to five hundred meters long. This census technique was chosen due to a lack of large areas of contiguous habitat. A fifty meter width minimizes edge effect of adjacent habitats. The limiting factor of the belt-transect censusing was weather. Once the habitat types were identified and the transects in place, continual gusting winds made censusing impossible. Although spot-mapping on a plot would be possible in the Gates area, our sampling period was too short to make this technique useful. In the future, this would be a good place to concentrate breeding bird studies.

In light of this preliminary study, there is great potential for long term study of the birds in the Aniakchak Caldera. Long term research could provide understanding of yearly variations in weather patterns, spring melt-off, and seasonal movement of birds. Permanent plots and transects could be set up to look at relative abundance and density throughout the breeding season and from year to year. A banding program could increase knowledge of movements and life cycles. The greatest potential for extended ornithological research is in the understanding of succession inside the Aniakchak Caldera.

HABITAT DESCRIPTIONS:

Working with the research team's botanist, I identified five distinct habitat types inside the caldera. A brief description of the habitats and a summary of the bird species associated with each type follows. For a detailed analysis of the plant species composition inside the caldera, see Koren Bosworth's accompanying report.

1. MARSH: The marsh area at the inlets of Surprise Lake is characterized by Carex lyngbyaei interspersed with mounds of semi-aquatic mosses. Several drier mounds support Salix alexensis, Elymus arenarius, and Lupinus nootkatensis. Many bird species were observed in and around this area.

Sightings of Mallard, Green-winged Teal, and Northern Pintail were all of individual females. This indicates the possibility of nesting activity for all three species, although no definite findings were made. A female Greater Scaup was flushed from a Carex mound with trails leading to what appeared to be a nest site. At a later date, a female Greater Scaup with young was observed on Surprise Lake near the marsh area.

Shorebirds utilizing the marsh, accompanying dunes and sandy areas included, were Semi-palmated Plover, Wandering Tattler, Red-necked Phalarope, Common Snipe, Rock Sandpiper, Western Sandpiper, and Least Sandpiper. It is likely that all of these species were breeding, although evidence was only found for some.

Mew Gull, Bonaparte's Gull, and Arctic Tern were all present in the marsh and along the beach adjoining the marsh at the

northwest end of Surprise Lake. Arctic tern were found to be breeding. Small sockeye salmon and Dolly Varden provide a good food source here.

Bank swallows nesting in a cut bank at the north end of Surprise Lake were often seen feeding in the marsh area. On occasion, an adult Bald Eagle soared over the marsh only to be divebombed by Arctic Terns.

2. GATES: The Gates area includes lush growth where the Aniakchak River flows out of the caldera. It may be characterized as a mixed herb community (mesic forb herbaceous). The main plant species comprising this habitat include: Salix alexensis, Lupinus nootkatensis, Epilobium latifolium, Achillea borealis, and Rhytiadelphous squarrosus, a ubiquitous moss of this area.

Many bird species inhabit this zone, including a pair of American Dippers. The dippers were nesting near a waterfall upstream on one of the creeks feeding the Aniakchak River. They were seen utilizing the creeks and river for food collection.

Snow Buntings were observed nesting in a rocky outcropping over the creek and feeding fledglings on talus slopes surrounding the Gates. At least one pair of Savannah Sparrows was discovered nesting in the willows. On one occasion, a flock of 18 bank swallows was seen feeding on insects 20-30 ft above the garden at the Gates.

Also observed were Water Pipits, the most abundant species in almost all of the habitat types described. Occasionally, gulls were seen flying in through the Gates. And, this is the only place Spotted Sandpipers were observed in the caldera.

3. COVES: Although the coves along the southwest shore of Surprise Lake support the greatest diversity of plant species, bird species diversity was low. Grasses and sedges in the coves include Elymus arenarius, Calamagrostis canadensis, and Carex macrochaeta. A mixture of Heracleum and Angelica as well as Lupinus nootkatensis and Salix alexensis also occur in the cove. Empetrum nigrum, Salix arctica, and Rhacomitrium canescens grow on the rocky headlands.

In almost every cove, adult Water Pipits were seen feeding fledglings. This was definitely the most visible and the most vocal species. Golden-crowned sparrows utilized Salix alexensis for nesting, as did the Common Redpoll. Semi-palmated Plovers were seen further up the coves in less vegetated areas.

Although no nest was found, there were two sitings of an adult male Belted Kingfisher flying and perching on the rocky heads of several coves. An immature Northern Shrike arrived in the coves on 19 July. It remained visible for 2 days.

Snow Buntings, Rosy Finches, and Rock Ptarmigan were seen in the coves from time to time, although more often they inhabited areas just above the vegetation on the rocky outcroppings, ashy stream beds, and pumice ridgetops.

Flying over the coves and lakeshore were Mew Gulls, Glaucous-winged Gulls, and Arctic Terns.

4. BEACH-RYE GRASS DUNES: This habitat type consists mainly of dunes covered mostly by Elymus arenarius and some Lupinus nootkatensis with Salix alexensis interspersed between areas of bare ashy ground. Most of these dunes occur at the Surprise Lake inlet and along the southwest shore where the lake narrows.

Nesting bird species included those utilizing the Elymus and Salix: Lapland Longspur, Common Redpoll, Savannah Sparrow, and occasional Golden-crowned Sparrows. Rock, Western, and Least Sandpipers and Semi-palmated Plovers seemed to prefer the bare ground areas between the dunes. Arctic Terns frequently cruised this area as well.

5. NON-VEGETATED AREAS: This habitat type includes bare ash fields, rocky ridgetops, lava flows, and all areas of the caldera not included in the other habitats types previously described. Although mosses, lichens, and small herbaceous plants are present to some degree, these "non-vegetated" areas are visually distinct. A corresponding lack of an abundant bird life and low species diversity characterizes this habitat type.

Rock Ptarmigan were seen on the rocky ridges above the coves along Surprise Lake and in the conglomerate boulder area below the large lake at the southeast corner of the caldera (below Blacknose). Snow Buntings and Rosy Finches were seen on rocky ridgetops, among conglomerate boulders, in gravelly stream beds, and on lava flows.

Semi-palmated Plovers were occasionally seen on bare ground and rocky substrate. Most common raven sitings occurred around the caldera rim.

SPECIES ACCOUNTS:

This list includes all species observed inside the Aniakchak Caldera between 8 July and 27 July, 1987. Breeding species are marked by an asterisk. Evidence for breeding includes: nests found, presence of fledglings, adults seen carrying food, feigning behavior and distress calling. The list of breeding species is not all inclusive. It is likely that other species present were breeding, but no evidence was observed.

Relative abundance was roughly estimated by the percentage of sightings of a species per outing. An outing is equivalent to one hour or more spent in the field in any of the five habitat types. These include: 1-marsh, 2-Gates, 3-coves, 4-beach-rye grass dunes, and 5-non-vegetated areas. The abundance categories are as follows:

- ABUNDANT (A) - seen on 75-100% of outings
- COMMON (C) - seen on 50-75 % of outings
- UNCOMMON (U) - seen on 25-50% of outings
- RARE (R) - seen on 0-25% of outings

This list includes 37 species representing 15 families, 15 of which were breeding.

1. MALLARD (Anas platyrhynchos): RARE; On 10 July, a female was flushed from the marsh at Surprise Lake inlet.
2. GREEN-WINGED TEAL (Anas crecca): RARE; A female was sighted on 10 July and 12 July at Surprise Lake inlet.
3. NORTHERN PINTAIL (Anas acuta): RARE; Sightings of a female were recorded on 10 July, 19 July, and 25 July at Surprise Lake inlet.
4. * GREATER SCAUP (Aythya marila): ABUNDANT; Male scaup were present on Surprise Lake throughout our stay. Ten individuals were observed on 16 July. The males generally occupied the southeast portion of the lake just above the outlet. A female with 8 young was seen at the other end of the lake on 26 July.
5. SURF SCOTER (Melanitta perspicillata): RARE; First observed on 14 July; one male remained visible on Surprise Lake for three days.
6. BARROW'S GOLDENEYE (Bucephala islandica): ABUNDANT; Eight individuals were seen on 16 July. Most observations were made in the southeast portion of the lake, but they were present throughout the lake in smaller numbers.
7. RED-BREASTED MERGANSER (Mergus merganser): UNCOMMON; Males and females were observed on several occasions. Eight females arrived on the lake on 25 July.
8. * SEMI-PALMATED PLOVER (Charadrius semipalmatus): ABUNDANT; This species was present on every outing. They tended to occur on ridges above the coves and in bare ground areas.
9. LESSER YELLOWLEGS (Tringa flavipes): RARE; Four individuals were seen in the marsh on the southeast side of Surprise Lake outlet on 26 July. Because this area was only accessible by boat, little time was spent here.
10. SPOTTED SANDPIPER (Actitis macularia): RARE; One individual was seen in the Gates area on 11 July.
11. WANDERING TATTLER (Heteroscelus incanus): RARE; One sighting of an individual on 12 July at Surprise Lake inlet.
12. * RED-NECKED PHALAROPE (Phalaropus lobatus): UNCOMMON; Adults with young seen at Surprise Lake inlet.
13. * COMMON SNIFE (Gallinago gallinago): UNCOMMON; Although not very visible, Common Snipe were heard on several occasions at Surprise Lake inlet.
14. * ROCK SANDPIPER (Calidris ptilocnemis): COMMON; Less

abundant than Least and Western Sandpipers, this species was seen along the shores of Surprise Lake in the marsh area and at the lake's outlet.

15. * WESTERN SANDPIPER (Calidris mauri): ABUNDANT; Very visible especially along the beaches at Surprise Lake inlet.

16. * LEAST SANDPIPER (Calidris minutilla): ABUNDANT; Very abundant along the shores of Surprise Lake.

17. BONAPARTE'S GULL (Larus philadelphia): UNCOMMON; One first summer bird was observed at Surprise Lake inlet from 12 July until 27 July. Adults were seen feeding on the southeast portion of Surprise Lake and flying throughout the lake area.

18. MEW GULL (Larus canus): COMMON; Adults were seen on and around Surprise Lake. On 15 July, four adults flew in through the Gates. One adult was often present at Surprise Lake inlet.

19. GLAUCOUS-WINGED GULL (Larus glaucescens): UNCOMMON; The first sighting was of three adults on 18 July flying along the southwest shore of Surprise Lake towards the inlet. Adults were observed more frequently after that.

20. * ARCTIC TERN (Sterna paradisaea): COMMON; Although few in number, Arctic Terns were visibly present throughout the study period. Observations were made of the only evident nesting pair, and the development of their single fledgling. Early stages of growth were spent at Surprise Lake inlet. Later, the adults and fledgling were seen feeding at the other end of the lake.

21. BALD EAGLE (Haliaeetus leucocephalus): UNCOMMON; Seen periodically, adult Bald Eagles cruised over Surprise Lake, the marshy inlet, the Gates area, and other portions of the caldera.

22. BUTEO sp.: RARE; On 12 July, one individual was seen flying northwest between Half Cone and Spatter Cone 1445.

23. PEREGRINE FALCON (Falco peregrinus): RARE; One individual was seen flying low along the ridgetop above Cove #1 on 16 July. It dove after a Water Pipit.

24. GYRFALCON (Falco rusticolus): RARE; A pair of gyrfalcons was observed flying high to the northwest above Spatter Cone 1445 towards Birthday Pass on 15 July. Vocalizations could be heard, and one individual appeared larger.

25. ROCK PTARMIGAN (Lagopus mutus): UNCOMMON; Individuals were seen in the conglomerate boulder area and along ridgetops above Surprise Lake coves. Although no evidence was observed, it is likely that Rock Ptarmigan are caldera breeders.

26. BELTED KINGFISHER (Ceryle alcyon): RARE; An adult male was observed along the western shore of Surprise Lake on 18 July and

27 July. No evidence for breeding was found.

27. * BANK SWALLOW (Riparia riparia): COMMON; Present throughout the Surprise Lake area, Bank Swallows were found to be nesting on a stream-cut bank at the northern end of the lake near the inlet. On 15 July, 18 individuals were observed about twenty to thirty feet above the ground in the Gates area.

28. COMMON RAVEN (Corvus corax): COMMON; Most sightings occurred around the rim of the caldera. Vocalizations were heard more frequently than actual sightings made. Ravens were not observed around Surprise Lake. Nesting status was difficult to access.

29. NORTERN SHRIKE (Lanius excubitor): RARE; One immature bird appeared at Surprise Lake warm springs on 18 July. During the next two days, an immature individual was seen in the vicinity of Cove #1, presumably the same individual.

30. * WATER PIPIT (Anthus spinoletta): ABUNDANT; By far the most abundant species, Water Pipits occurred almost everywhere, even in the 1931 eruption site. Prolific breeding was observed all along the north, south, and west shores of Surprise Lake. This species seemed tolerant of the less vegetated habitats as well.

31. * AMERICAN DIPPER (Cinclus mexicanus): UNCOMMON; At least two pairs of Dippers were present in the caldera---one at the stream feeding directly into the Gates with the waterfall on it, and a pair on a stream feeding into the northeast side of Surprise Lake. Frequent observations were made of the nesting pair at the Gates.

32. * SAVANNAH SPARROW (Passerculus sandwichensis): ABUNDANT; Present along the shores of Surprise Lake, Savannah Sparrows seemed to prefer Salix alexensis and Elymus arenarius for nesting. They were also observed at Surprise Lake inlet and in the Gates area.

33. WHITE-CROWNED SPARROW (Zonotrichia leucophrys): RARE; Mostly vocalizations confirmed the presence of this species. No evidence of breeding was observed. On several occasions, males were heard singing on the northeast shore of Surprise Lake. This area was not visited until 26 July.

34. * GOLDEN-CROWNED SPARROW (Zonotrichia atricapilla): ABUNDANT; Breeding was evident on the northeast and southwest shores of Surprise Lake. Protected coves with Salix alexensis seemed to be preferred.

35. * LAPLAND LONGSPUR (Calcarius lapponicus): ABUNDANT; This species was seen mostly in Elymus arenarius dunes along the southwest shore and at the inlet of Surprise Lake. Individuals were also seen in the Gates area and occasionally in the lakeshore coves.

36. * SNOW BUNTING (Plectrophenax nivalis): ABUNDANT; While nesting in rocky outcroppings, Snow Buntings were seen to utilize the Gates area and lakeshore as well. This species was observed in all habitat types.

37. * COMMON REDPOLL (Carduelis flammea): ABUNDANT; Nesting pairs were found in Salix alexensis at Surprise Lake inlet and on the west and east shores. Redpolls were also observed in the Gates area.

38. * ROSY FINCH (Leucosticte arctoa): COMMON; Although no direct evidence was found, it is likely that Rosy Finches were breeding in the caldera. Inhabitants of rocky areas, they were seen in all habitat types.

EVIDENCE OF BREEDING:

With the breeding season well under way when we arrived, direct evidence for breeding was easily observed in numerous species. Some species were presumably breeding, although no positive findings were made. A total of 15 species were found to be nesting in the caldera. Evidence used to establish breeding status included: nests found, presence of fledglings, adults seen carrying food and feeding young, feigning behavior and distress calling.

1. GREATER SCAUP: Male Scaup were seen on the lake every day during our stay in the caldera. One female Scaup was flushed from a small Carex-covered mound with trails leading to a possible nest site. The high water level around the island prevented a thorough inspection for nestlings or eggs. On 26 July, however, a female with 8 young was seen on Surprise Lake near the marshy inlet.

2. SEMI-PALMATED PLOVER: On numerous occasions, we observed feigning behavior among adults Plovers. We found one dead chick, but no nests. Young of the year were observed with adults at various locations.

3. RED-NECKED PHALAROPE: Two adults and two young were seen at the inlet to Surprise Lake on 10 July.

4. COMMON SNIBE: We heard winnowing of tail feathers on numerous outings, and flight displays were also observed. All sightings occurred at the inlet to Surprise Lake.

5. ROCK SANDPIPER:

6. WESTERN SANDPIPER:

7. LEAST SANDPIPER:

All three species of sandpipers are presumably nesting in the caldera. Feigning behavior was frequently observed among

Least and Western Sandpipers. Rock Sandpipers were less abundant and less visible, but adults had distinct breeding plumage and were observed with young.

8. ARCTIC TERN: A pair of Arctic Terns with a single fledgling were repeatedly observed at Surprise Lake inlet. When first observed on 10 July, the fledgling was swimming, and it was uniformly gray in color. By 19 July, a partial black crown was visible, and the bird was flying. By the end of the trip, both adults and the immature were seen feeding at the other end of Surprise Lake.

9. BANK SWALLOW: Adult swallows were observed flying in and out of holes in a bank on the north shore of Surprise Lake. A total of twenty-five to thirty holes were present. Other potential nests sites for Bank Swallows exist in the caldera.

10. WATER PIPIT: More evidence of breeding was observed for Water Pipits than any other species in the caldera. In every cove along the lake's southwest shore, at least one pair of distressed parents was observed feeding young. Even after heavy wind and rain, surviving fledglings were being fed by adults.

11. AMERICAN DIPPER: At least one pair of Dippers was seen feeding nestlings along the creek with a waterfall near the Gates. The nest site was close to the falls in a deep, mossy hole. The adults collected food along the river inside the Gates and on the creek drainage above and below the falls. At least one nestling fledged on 15 July.

12. SAVANNAH SPARROW: Nesting Savannah Sparrows were evident in the Gates area. One nest found in a crotch of Salix alexensis contained no eggs on 9 July, one egg on 11 July, and 3 eggs on 15 July. Dimensions of nest were as follows:

- 3 ft from edge of shrub
- 29 in from ground
- 1.75 in inside cup
- 3 in outside cup
- 2 in cup depth

Other signs of breeding observed included adults carrying food and making distress calls along the lakeshore and in the coves.

13. GOLDEN-CROWNED SPARROW: Adults were observed with a fledgling in a cove on the southwest shore of Surprise Lake. Distress behavior was also noted.

14. LAPLAND LONGSPUR: Pairs of adults were observed in areas of beach-rye grass and lupine. At least two fledgling longspurs were seen.

15. SNOW BUNTING: Three Snow Bunting nests were located, and each contained nestlings. Rocky crevices ranging from 5-50 ft above ground were characteristic sites. Details of each nest were as follows:

- Nest on small spatter cone (near cone 1445).
50 ft above ground.
Northern exposure.
- Nest in cove #10 along Surprise Lake southwest shore.
7.5 ft above ground.
2.5 in wide.
1.0 in deep.
Northwest exposure.
12 July---2 nestlings, fuzzy with gaping mouths
15 July---1 dead nestling in nest
- 13 July---Immature Snow Buntings flying around Gates.
- Nest near waterfall.
8 ft above stream
Southeast exposure.
13 July---1 nestling

16. COMMON REDPOLL: One Redpoll nest with three eggs was found in a willow near Surprise Lake inlet. Other adult Redpolls were observed feeding fledglings along lakeshore near the Gates.

Species likely to be breeding include ROCK PTARMIGAN, WHITE-CROWNED SPARROW, and ROSY FINCH.

BIRD SPECIES LIST:

ANATIDAE

1. MALLARD
2. GREEN-WINGED TEAL
3. NORTHERN PINTAIL
4. GREATER SCAUP
5. SURF SCOTER
6. BARROW'S GOLDENEYE
7. RED-BREASTED MERGANSER

CHARADRIIDAE

8. SEMI-PALMATED PLOVER
9. LESSER YELLOWLEGS

SCOLOPACIDAE

10. SPOTTED SANDPIPER
11. WANDERING TATTLER
12. RED-NECKED PHALAROPE
13. COMMON SNIPE
14. ROCK SANDPIPER
15. WESTERN SANDPIPER
16. LEAST SANDPIPER

LARIDAE

- 17. BONAPARTE`S GULL
- 18. MEW GULL
- 19. GLAUCOUS-WINGED GULL
- 20. ARCTIC TERN

ACCIPITRIDAE

- 21. BALD EAGLE
- 22. BUTEO SP.

FALCONIDAE

- 23. PEREGRINE FALCON
- 24. GYRFALCON

PHASIANIDAE

- 25. ROCK PTARMIGAN

ALCEDINIDAE

- 26. BELTED KINGFISHER

HIRUNDINIDAE

- 27. BANK SWALLOW

CORVIDAE

- 28. COMMON RAVEN

LANIIDAE

- 29. NORTHERN SHRIKE

MOTACILLIDAE

- 30. WATER PIPIT

CINCLIDAE

- 31. AMERICAN DIPPER

EMBERIZIDAE

- 32. SAVANNAH SPARROW
- 33. WHITE-CROWNED SPARROW
- 34. GOLDEN-CROWNED SPARROW
- 35. LAPLAND LONGSPUR
- 36. SNOW BUNTING

FRINGILLIDAE

- 37. COMMON REDPOLL
- 38. ROSY FINCH