

BIOLOGY AND PRODUCTIVITY OF GEESE
ON THE YUKON-KUSKOKWIM DELTA, ALASKA, 1983

Interim Progress Report

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by

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WEATHER AND HABITAT CONDITIONS

Snow cover was 90-95% complete in the Old Chevak area upon our arrival May 5-6. Warm temperatures the previous week had resulted in the snow pack becoming heavily water laden. Some melt water had run onto the Kashunuk River and refrozen. Cold nights (i.e., low 20°s F) resulted in a hard crust on the snow; but warm days (38°-48°), sunny conditions, and wind resulted in melting and blowing of most snow off the upland tundra by May 8. Unseasonably warm weather returned on May 9 and lasted until May 17 (not freezing at night - high temperatures from 44° to 60°). The following represents a summary of habitat "emergence":

- May 9
 - Upland tundra 95% free of snow.
 - Riverside marshes open and draining melt water onto rivers.
Waterfowl concentrated here to feed.
 - Lowland meadows still 100% snow covered.
 - No nest sites available.

- May 13
 - Lowland meadows now flooding.
 - Upland lakes - often ice/slush covered and islands flooded.

- May 15
 - Lowlands draining rapidly - first islands (those highest and driest) may be available, but base is wet - 95% of islands still flooded or too wet for nesting.
 - Upland tundra lakes still 60% ice covered and snow along protected banks; water levels high - Island nest sites not available.

- Nest sites for White-fronted geese available (some) or becoming so.
- May 17 - Most lowland habitat drained of "excess" melt/water and water
& 18 levels now at pond shores - but islands very wet (moist).
- May 20 - Highest lowland islands OK for nesting, majority too wet.
- Still partial ice cover on upland lakes.
- May 22 - Ice began moving on Kashunuk River but jammed at "Emperor" Bend
(near Onumtuk Slough).
- May 25 - Only remnants of ice on upland lakes - most nest sites
available and nearly all available in lowlands.
- May 30 - Kashunuk River cleared of ice, still some on banks but boat
& 31 travel possible.

MIGRATION ARRIVAL

Upon our arrival at Chevak on May 5 and Old Chevak the evening of May 5-6, we observed only scattered small numbers of white-fronted geese, swans and cranes. Jack Paniyak reported the same. A major migration arrival occurred on May 7, 8, and 9, with the peak being May 8 for Emperor geese, Cackling geese, and White-fronted geese. Noticeable migration of emperor geese continued to May 12, but on a much smaller volume. Brant were only seen

rarely until 18-22 May when a major migration proceeded past Old Chevak on a bearing toward Kokechik Bay.

BREEDING BIOLOGY

White-fronted Geese

Density - We found 29 nests on the main study area + 32 in total. As in the past, most nests were along small slough banks. Detailed analysis must await more time. The number of nests is comparable to 1977 and 1979, but fewer than 1978 (N=46).

Nest Initiation - All nests which we found during egg laying or could back-date initiation from hatch day (by allowing 25 days for incubation and an egg-laying rate of 1 per day with a "skip" day for clutches of 5 or more) were begun (first egg) between 16 May and 27 May (12 days) (N=22). Sixteen of these (73%) were begun between 18-22 May (5 days).

Hatching Period - All successful (N=19) nests hatched between 16-24 June (9 days) with 13 (68%) of these hatching between 18-22 June (5 days).

Clutch Sizes - Clutch sizes were large, reflecting the food availability and early melt pattern which allowed early nesting. Mean clutch size was 5.39 ± 0.31 (S.E.)(N=23). The mode was 6 and 16 of 23 nests (70%) contained 5, 6, or 7 eggs.

Nesting Success - Nine (9) of 32 nests (28%) had been depredated before we found them or even before we had been in the vicinity. One of those was probably the result of subsistence activities. Two other nests were destroyed after we had found them. Thus, hatching success was 66% (21 of 32) (at least one egg hatching). At least 6 nests (19%) lost one or more eggs to predation but were successful.

An adult bird was killed in the vicinity of two nests (parts of carcass found). At one other nest, an adult was at least attacked (many feathers, some in clumps).

Emperor Geese

Density - We found 41 nests on the regular study area and 3 in the "control" area for a total of 44. This is as many as we have ever found, but details await comparison.

Nest Initiation - At this writing (28 June) one nest's still active. Other nests which we found during egg laying or could backdate initiation dates from hatch day (same time intervals and methods as for whitefronts) were begun between 17-30 May (14 days; N=22). Nest initiation was spread uniformly throughout this period with no clearly defined peak or mode (11 nests or 50% between 17-23 May and 50% between 24-30 May).

Hatching Period - Seventeen successful nests were hatched between 16-26 June (11 days) and one is still active as of 28 June. As for nest initiation, there was no clearly defined peak of hatching within the above time period.

Clutch Sizes - Mean clutch size was 5.56 ± 0.4 (S.E.) (N=27) with a range from 3 to 10. The mode was 5 (N=8). There was one 8-egg clutch, two 9-egg clutches, and one 10-egg clutch. If these are considered the product of two or more females (which is virtually a certainty), then mean clutch size was 5.00 ± 0.29 (S.E.) (N=30).

Nest Success - Twelve of 44 nests (27%) had been depredated before they were found and further 10 nests (23%) were destroyed after they were found. One of these was probably the result of subsistence activities. One nest was deserted, one nest was accidentally destroyed and one nest is still active. If this last nest hatches, maximum success rate (hatching = at least one egg in a nest hatching) will be 20 of 44 (45%). At least 6 nests (14%) had experienced partial losses to predators.

The fresh carcass of an adult male Emperor goose was found within 20 paces of a destroyed nest. Copious amounts of contour feathers, usually with small pieces of flesh or in clumps, suggest that 4 other emperor geese were at least attacked at their nests (all nests destroyed).

Brant

Density - We found 15 nests of brant which is little different than in previous years.

Nest Initiation - One nest was begun 21 May and one on 22 May. One was begun before 21 May and two nests were begun after 23 May but before 30 May.

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Clutch Sizes - $\bar{x} = 3.14 \pm 0.51$ (S.E.), $N = 7$, Range = 1 - 5.

Nest Success - Eight (8) of the 15 nests (53%) were destroyed before we found them and we believe 5 of these were taken by humans as evidenced by footprints and location. Three were depredated later and a total of 4 nests hatched (27%) [all of these were on one lake].

Success of brant is always low on our study area, with or without interference by humans.

Cackling Canada Geese

Density - We found 90 nests of cackling geese. This is 26% to 34% below the numbers found between 1977 and 1979 when search methods were comparable. Five nests were found during egg laying which were destroyed and would not have been identifiable as 1983 nests during the intensive search during the incubation period. Two nests were begun after we had made an intensive search in an area. Therefore, the number of cackling goose nests most comparable to the density reported in 1981 and 1982 is 83. This is 19 more than 1982 (+30%) and 4 fewer than 1981 (-5%). These results suggest that there was a substantial number of adult geese which failed to nest in 1982.

Nest Initiation - At this writing (29 June) 9 nests are still active.

Other nests which we found during egg laying or could backdate initiation dates from hatch day (by allowing 26 days for incubation and an egg-laying rate of 1 per day with a "skip" day for clutches of 5 or more) were begun between 20 May and 6 June (N=28). This is an unprecedented 18 day span for nest initiation and it is almost certain that it will be even longer as we have 9 nests yet to hatch. However, these very late nests are a small proportion of the total, but an interesting indication of potential when an early melt and "optimum" food conditions prevail as appears to have been the case this year. Seventeen of 28 nests (61%) were initiated between 20-25 May and 22 (79%) were begun 20-27 May.

Hatching Period - Fourteen nests were hatched between 20-27 June and nine are still active with the latest known projected hatching date being July 7 or 8. There may be some which hatch even later. As for nest initiation, the hatching period is unusually drawn out this year.

Clutch Sizes - Mean clutch size was 5.14 ± 0.27 (N=37) with a range from 2-9. The nine egg clutch appeared to be the result of two females based on two distinctly different sizes of eggs and suggest that these were clutches of 5 and 4 eggs. If these are considered as 2 clutches, than mean clutch size was 5.00 ± 0.24 (N=38, range 2-7). Sixteen of 37 (43%) clutches contained 6 or 7 eggs (N=8 each).

Nesting Success - Final figures must await a future analysis as 9 nests are yet active. However, it is obvious that losses to predators were high (but not as high as 1982). Thirty-nine of 90 (43%) nests has been destroyed before they had been found the first time (one thought to be

from subsistence activities).

Sixteen (18%) were destroyed after being found with eggs for a total loss to predators of 55 of 90 nests (61%). There was little difference between our control area (22 of 38 nests depredated = 58%) and main study area (33 of 52 nests depredated = 64%) by an emperor goose. Thus, even if all 9 remaining nests hatch the maximum nesting success will be 38%.

One adult was attacked and probably killed on a peninsula adjacent to a destroyed nest (as judged from contour feathers). A large number of nests on islands were destroyed which there was no remaining evidence of egg shells such as often observed when jaegers are responsible for nest losses. This suggests that perhaps mink were responsible for much depredation but this deserves further study.

SUMMARY

The attached table provides a summary of numerical data. A more complete report will be provided at a later date.

Table 1. Summary of events related to nesting of geese on the Yukon-Kuskokwim Delta, Alaska in 1983.

Event	Species		
	Cackler	Emperor	White-front
Major Arrival	8-9 May	7-10 May +	8-9 May - some earlier
Number of Nests	90	44	33
Nest Initiation (span)	20 May-6 June	17-30 May	16-27 May
Peak	20-27 May	even throughout	18-22 May
Hatch Period (span)	some still active	16-26 June	16-24 June
(peak)	20-27 June	even throughout	18-22 June
Clutch Size (+ S.E.)	5.14 + 0.27 (N=37)	5.56 + 0.4 (N=30)	5.39 + 0.31 (N=23)
Nesting Success	<u>38%</u> maximum possible	<u>45%</u>	<u>66%</u>
<u>Break-up chronology</u>			
Lowland Meadows Flooding	--	May 13-17	
Nest Habitat Available	--	May 17-25	
Kashunuk River Ice-free	—	May 30-31	