

Nesting Behavior and Food Habits of Parasitic Jaegers at Anderson River Delta, Northwest Territories

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Based on the seven nests located at Anderson River delta in 1973, Parasitic Jaegers (*Stercorarius parasiticus*) had a breeding density of 1 pair per 2300 ha. Breeding success was 14.3%. Males and females shared incubation. A chick at one nest was unattended by an adult only 8% of the time. Defended core areas were within a 300-m radius of the nest, although hunting areas extended at least 3 km. Bird remains, particularly passerines, were found in 85.0% of the pellets collected. Mammals, mainly microtine rodents, were in 25.4% of the pellets. Other food included eggs, insects, and berries.

Parasitic Jaegers (*Stercorarius parasiticus*) have a breeding range in North America that in part overlaps with that of Pomarine (*S. pomarinus*) and Long-tailed Jaegers (*S. longicaudus*). Pitelka et al. (1955) and Maher (1974) have studied the ecology of these three species of jaegers in Alaska where they are sympatric. The Parasitic Jaeger was the only species of jaeger breeding in the Anderson River delta, Northwest Territories (69°42'N, 129°00'W). The other species occurred only as migrants (MacFarlane 1891; Höhn 1959; Barry 1967). We studied nesting Parasitic Jaegers in this area where they were free from interactions with other jaeger species. This paper reports their nesting behavior and food habits in 1973 at the Anderson River delta.

Study Area and Methods

The study area is shown by the delta boundary in Figure 1. A detailed description of the physical features and vegetation of the delta is given by Barry (1967). Parasitic Jaegers and Glaucous Gulls (*Larus hyperboreus*) are the principal avian predators in the delta. There are nesting colonies of Lesser Snow Geese (*Chen caerulescens caerulescens*) and Black Brant (*Branta bernicula nigricans*) and scattered nests of other birds throughout the area.

In 1973 we searched the 16 300-ha delta, by boat and on foot for nesting jaegers, which make themselves conspicuous by their characteristic defence display when their nests are approached.

Nests were located and visited regularly to record their nesting chronology. We bow-trapped three adults while they were incubating and color-marked them with spray paint to enable us to make observations on their hunting areas. We built an observation tower near nest 1 (Figure 1), from which we recorded data on incubation, chick care, defensive behavior, and hunting habits.

Additional observations were made of jaegers hunting over the nearby goose colony. Regurgitated pellets and loose food items were collected from the core areas of nesting pairs. Individual food items were identified to species when possible.

Additional field observations of Parasitic Jaegers from other years are included where applicable.

Results and Discussion

Breeding Biology

The first Parasitic Jaeger arrived at the Anderson River delta between 25 May and 1 June from 1953 to 1972. The first arrivals in 1973 and 1974 were on 27 May. The estimated maximum pre-laying period for the pair that laid first was only 7 days. This supports Maher's (1974) conclusion that for arctic nesting Parasitic Jaegers, the pre-laying stage is much shorter than the 3 weeks Perry (1948) reported for jaegers in Britain.

The chronology for each of seven nests located is given in Table 1. At each nest only a few days

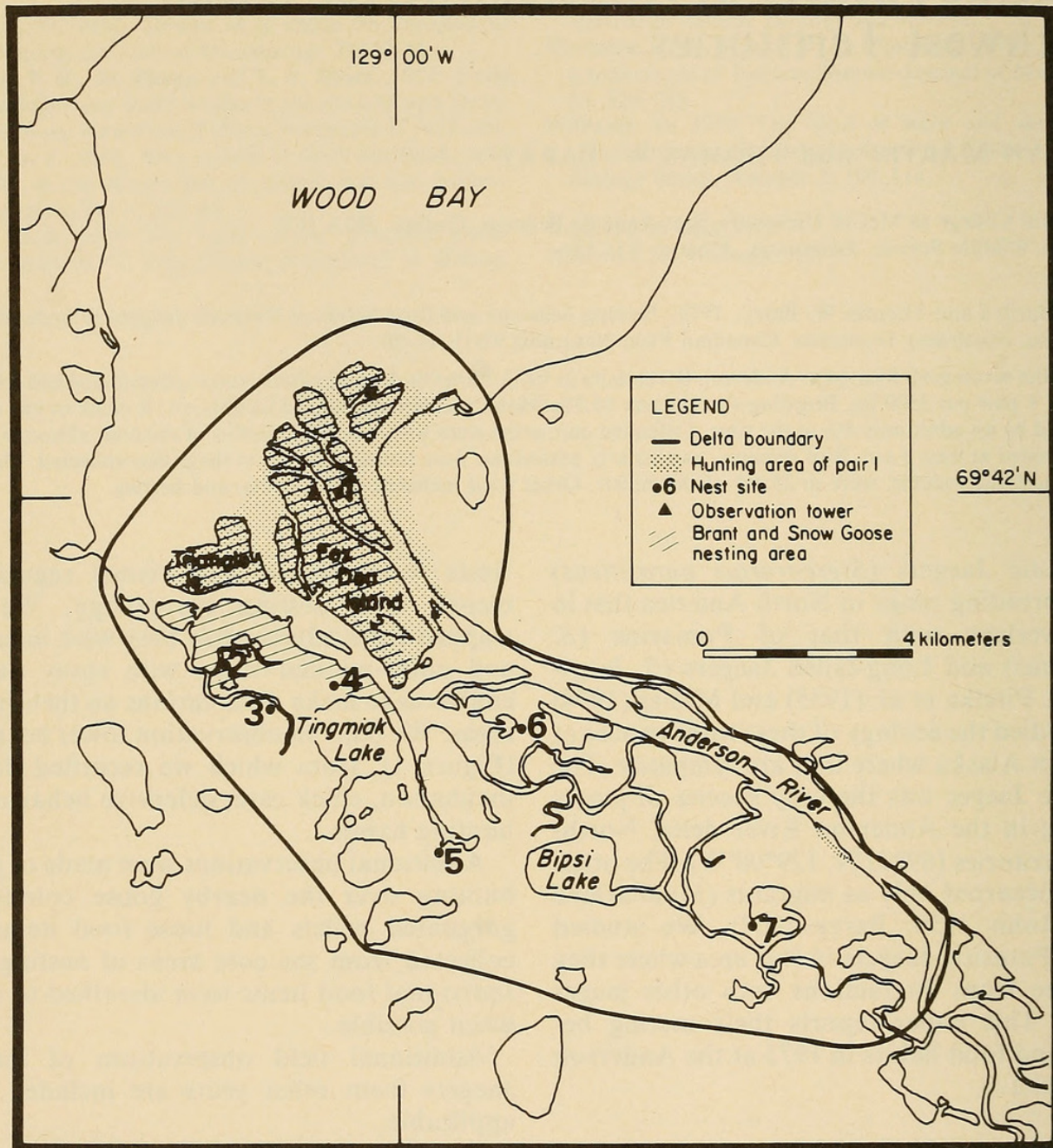


FIGURE 1. Location of Parasitic Jaeger nests and hunting area of pair 1 at Anderson River delta in 1973.

after the eggs had hatched, the younger chick could not be found. Nesting success, involving two chicks fledging from 14 eggs, was 14.3%. Both predation and differential chick mortality contributed to the poor breeding success in 1973. Both chicks that fledged were still present in the core area and were accompanied by an adult on 10 August. The chicks moved away from the nest within a day or two of hatching so that growth data was difficult to collect; however, one chick weighed 400 g at fledging and the other 425 g. Their ability to fly improved rapidly. On several occasions they were seen chasing their parents.

The nesting density of jaegers at Anderson River in 1973, using the total area of the delta, was 1 pair per 2300 ha. This was similar to the low breeding densities found elsewhere by Maher (1974) and Taylor (1974). In 1973 we observed a maximum of 10 jaegers whose nests we failed to find or which were pre-breeders, non-breeders, or failed breeders. The numbers of these birds can vary greatly as in 1959, when 50–60 non-nesting jaegers fed over the goose colonies. Taylor (1974) reported relatively constant numbers of non-breeders each year on Bathurst Island where there were few geese. In

TABLE 1—Nesting chronology for Parasitic Jaegers at Anderson River, Northwest Territories in 1973

Nest	Clutch size	Date of laying of first egg	Hatching date	Fledging date
1	2	June 8*	July 5	Disappeared July 20
2	2	Taken by a wolf	—	—
3	2	Infertile or "embryonic death"	—	—
		June 9*	July 6	August 4
5	2	June 3*	June 30	July 29
6	2	Disappeared before hatching	—	—
7	2	June 7*	July 4	Disappeared July 15

*Date estimated from hatching (accurate to 1 or 2 days).

1974 three jaeger pairs occupied the same areas but no nests were found. In 1974 arctic-breeding species generally had poor success because of bad weather.

The distances between the nest sites ranged from 900 to 7200 m as measured from aerial photos. Inter-nest distances varied widely and the sites were distributed unequally over the area (Figure 1). Nests 1, 2, 3, and 4 were concentrated in or near the goose colony. Similarly, Angstadt (1961) reported Parasitic Jaegers nesting on the periphery of a Blue Goose colony at McConnell River, Northwest Territories.

The distances between nests do not appear to reflect the defended area of Parasitic Jaegers. Breeding jaegers defended only a small area around their nests. Pair 1 defended a core area with a radius of about 180 to 300 m around their nest. The core area defended by other pairs appeared to be approximately the same size. Maher (1974), at Cape Sabine, found that pairs defended a core area with a radius of 183 to 275 m from the nest. He also observed territorial displays away from the core area; we did not see these displays. We observed other jaegers hunting without interference outside the core area and found that one member of a nesting pair often joined a hunting party when it passed near its core area. Breeding pairs did not challenge strange jaegers except at the core and even then jaegers were allowed closer than other avian species.

The known hunting area of pair 1 is shown in Figure 1. They were seen at least 3 km from their nest and may have travelled farther but they were no longer visible to us beyond 3 km. When there was a disturbance on the core area the hunting

bird of pair 1, if it was nearby, would return to join in the defense. Often only one bird was present during our visits to other nests, suggesting that members of these pairs were also foraging at some distance from the core area. Parmalee et al. (1967) and Taylor (1974) note that Parasitic Jaegers defend a relatively small area during the breeding season and do their hunting at some distance from the core area.

Nesting Behavior

During 40 h of observation of pair 1 between 30 June and 4 July 1973, the color-marked parent incubated the nest 55% of the time. Its mate performed 45% of the incubation, indicating that parent birds share incubation duties about equally. The period of attentiveness varied from 15 to 110 min but usually lasted at least 1 h. Incubation periods of shorter duration were usually the result of interruptions by intruders (e.g., other jaegers, gulls, Golden Eagles (*Aquila chrysaetos*)).

Normally the relieving bird glided toward the nest, and the incubating parent flew up seconds before its mate landed. It is possible that they vocalized during this period to achieve synchronization.

Pair 1 was observed, after their eggs had hatched, for a total of 21 h between 6 and 19 July. The color-marked parent remained in the core area 92% of the time. The other adult was present in the core area 38% of the time. The chick was alone only 8% of the time. At the other jaeger nests visited, the chick was never found alone even 12 days after fledging and was always found attended by the same adult, contrasting with Maher's (1974) findings that chicks were

alone 50% of the time.

During the incubation period, both adults of pair 1 hunted when they were not incubating. They did not share food until the day the first chick hatched. The color-marked bird begged from its mate, who regurgitated food. Subsequent to this, regurgitation was seen frequently. At other times the pair was observed to cooperate in pulling prey apart, with both taking a share. The color-marked parent sometimes left the core area to assist its mate in hunting or with an already initiated chase.

Aggressive behavior and the distraction display were strongly developed at the onset of incubation. As a human approached the core area the birds stood alert. Within 75–100 m of the nest the birds usually began their distraction display which consisted of vigorous wing-flapping, jumping, and loud whimpering. They performed on the ground and also in nearby ponds. As the human reached approximately 20–30 m from the nest an aggressive attack began. The bird generally flew in low from behind the intruder and frequently hit him with its wings and feet while it was in flight. There was much individual variation in these performances. The color-marked adult of pair 1 was always the more aggressive of the two, initiating most displays and continuing them longer. The other two color-marked jaegers were also more aggressive than their mates. This indicates there are differences in defensive behavior between individuals of a pair. Some pairs were more aggressive than others in the intensity and length of display. The amount of aggression decreased with the number of our visits.

Parasitic Jaegers also showed aggression toward Arctic Terns (*Sterna paradisaea*), Black Brant, Glaucous Gulls, Golden Eagles, other Parasitic Jaegers, Common Ravens (*Corvus corax*), Whistling Swans (*Olor columbianus*), Barren-ground Caribou (*Rangifer tarandus*), dogs (*Canis familiaris*), and a float plane.

Food Habits

Prey items in 173 food pellets were identified during the study (Table 2). Bird remains occurred in 85.0% of the pellets; remains of mammals appeared in 25.4%. Passerines accounted for 81.4% of the identified bird remains and the other 18.6% were from shorebirds.

Muskrat remains were all collected from one territory and were probably scavenged. Insect remains and berry skins and seeds always occurred in small amounts. Eggshells occurred in 15.6% of the pellets, most often in trace amounts. Grass was usually present in small amounts, probably picked up accidentally.

A large number of different food items were found among the loose food collected with the jaeger pellets. This material included eggs of ducks, geese, loons, and curlews; and the carcasses of an adult ptarmigan (*Lagopus* sp.), a young duck, and a small pike (*Esox* sp.). Parasitic Jaegers were also seen feeding on the eggs of Snow Geese, Black Brant, White-fronted Geese (*Anser albifrons*), Glaucous Gulls, Whistling Swans, Willow Ptarmigans (*Lagopus lagopus*), Lapland Longspurs (*Calcarius lapponicus*), and various ducks.

Quantities of blueberries (*Vaccinium uliginosum*), cloud-berries (*Rubus chamaemorus*), and crowberries (*Empetrum nigrum*) grew around nest 5. As these ripened, more and more droppings appeared that were composed of berry seeds and skins. No other nests had droppings containing berries, but no other jaegers had large berry patches within their territories.

Many authors have reported Parasitic Jaegers as predators on birds (Sutton 1932; Clarke 1940; Angstadt 1961; Parmalee et al. 1967; Taylor 1974). The results of this study clearly indicate that birds, especially passerines, are a major food item, with microtine rodents being much less important. Maher (1974) found in Alaska that birds made up 82% of food items, with passerines predominating.

Jaegers can eat eggs without ingesting much of the shell, so eggs may be a more important food item for nesting jaegers than our analysis of pellets indicates. Many birds had already started nesting when jaegers arrived in the spring. Geese lay one egg a day for several days before incubation begins and are off their nests for considerable periods. Hunting jaegers were frequently seen at goose nests during this period. Opportunities for nest predation decreased when geese began incubation. Jaegers then depended on accidental disturbances in the goose colony. In 1973 we did not see jaegers trying to drive geese from their nests, although

TABLE 2—Frequency (%) of food items in 173 pellets of Parasitic Jaegers, Anderson River delta, Northwest Territories, 1973

Food items	Frequency (%)
Bird remains (total)	85.0
Charadriiformes	9.8
Long-billed Dowitcher (<i>Limnodromus scolopaceus</i>)	.6
Semipalmated Sandpiper (<i>Ereunetes pusillus</i>)	4.6
Passeriformes	42.8
Horned Lark (<i>Eremophila alpestris</i>)	1.7
Water Pipit (<i>Anthus spinoletta</i>)	1.2
Redpoll (<i>Acanthis</i> spp.)	.6
Savannah Sparrow (<i>Passerculus sandwichensis</i>)	5.2
Tree Sparrow (<i>Spizella arborea</i>)	1.2
White-crowned Sparrow (<i>Zonotrichia leucophrys</i>)	3.5
Lapland Longspur (<i>Calcarius lapponicus</i>)	2.3
Unidentified bird remains	32.4
Eggshell	15.6
Mammal remains (total)	25.4
Insectivora	.6
Shrew (<i>Sorex arcticus</i>)	.6
Rodentia	22.8
Red-backed Vole (<i>Clethrionomys gapperi</i>)	1.7
Meadow Vole (<i>Microtus oeconomus</i>)	6.9
Muskrat (<i>Ondatra zibethicus</i>)	5.8
Lemming (<i>Lemmus</i> spp.)	4.6
Collared Lemming (<i>Dicrostonyx</i> spp.)	4.0
Carnivora	.6
Weasel (<i>Mustela</i> spp.)	.6
Unidentified mammal remains	1.2
Fish remains	.6
Insect remains	18.5
Berries	14.5
Grasses	32.4

Barry (1967) has seen this. Angstadt (1961) reported groups of jaegers harassing incubating geese, with little success.

Most hunting jaegers occurred in groups of one to three with a maximum of five. During the period when geese were incubating, groups of jaegers were frequently observed flying low over the colony. Jaegers were often seen rummaging in goose nests for eggs or abandoned goslings during and several days after the goose hatch. One hill was crowded with 175 Snow Goose nests and a great number of eggs was seen outside the nests. Jaegers were unable to scavenge these eggs until the geese moved out of the area.

Parasitic Jaegers appeared promptly in the goose colony whenever a disturbance arose such as the passing of a helicopter or a Golden Eagle.

Territorial fights among these geese provided jaegers with opportunities to prey on eggs. Barry (1967) found that visits to the goose colonies by Grizzly Bears (*Ursus arctos*), Red Foxes (*Vulpes vulpes*), and Arctic Foxes (*Alopex lagopus*) gave many opportunities for jaegers to feed on eggs. The mammals, feeding on eggs in one nest after another, frightened geese in their path, leaving the nests easy prey for jaegers. The same was true with human disturbances; jaegers would follow the field worker as he moved through the colony.

After the goose hatch was complete we often saw pair 1 chasing small birds, which they usually successfully caught. One bird often initiated a pursuit and was joined by the other. Sometimes the prey alighted in the grass; then, while one jaeger hovered, the other stalked the victim on the ground. If the prey flew away,

aerial pursuit began again. Pair 1 frequently walked through the grasses in their territory, and were likely catching insects.

During the 1973 study we witnessed a few incidents in which jaegers parasitized other species within their hunting range. On three occasions in the goose colony jaegers took food from Glaucous Gulls, but twice we saw gulls successfully pirate food from jaegers. Twice jaegers unsuccessfully attempted to steal fish from Arctic Loons (*Gavia arctica*) in flight and twice we saw them chasing Arctic Terns presumably for the same purpose. All these incidents involved adult jaegers. A chick that had fledged only 10 days earlier was seen attacking an Arctic Tern carrying a fish.

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