

Arctic Ecosystem Research in Queen Maud Gulf Bird Sanctuary, Nunavut: A Summary

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An ongoing study of the population ecology of arctic nesting waterfowl, specifically lesser snow, Ross's, greater white-fronted, and cackling geese, king eiders, and long-tailed ducks, has occurred annually in Queen Maud Gulf Bird Sanctuary since 1991. The primary field site is Karrak Lake, the site of one of the largest known lesser snow and Ross's goose nesting colonies in the Sanctuary. Each year, the abundance of each of the above-mentioned species nesting in the area is estimated, as are metrics associated with population dynamics, such as clutch size, egg survival, nest survival, and adult survival. These metrics are invaluable for addressing management concerns of harvested species, both within Canada and internationally within North America. Further, factors thought to influence reproductive ecology, such as spring chronology, meteorological conditions, and small mammal abundance, are monitored in order to explain annual variation in productivity. Dynamics of various pathogens are investigated in arctic foxes, small mammals, and geese. Research on population ecology of arctic fox is also conducted, as well as less-intensive studies on herring and glaucous gulls, arctic terns, red-throated loons, shorebirds, and passerines. Observational data on grizzly bears, wolverine, and wolves are also recorded.

A research station, established in 1991, is located at the main field site at Karrak Lake (67° 14' N, 100° 15' W). It consists of six plywood buildings ranging in size from 8x12' to 20x20', and is occupied by 4-15 personnel annually during 5 May to 20 August, for approximately 550 person-days per year. A 12x16' cabin was constructed approximately 15 km north of the Karrak Lake Research Station in 2010, at 67° 21' N, 100° 21' W. Over time, the goose nesting colony has grown substantially and the nesting distribution of birds has shifted to the north-west, such that the Karrak Lake Research Station is now located at the colony periphery. Increasingly, many regions are becoming difficult to access by foot, and this new cabin facilitates easier access to much of the colony. A cabin also exists at Perry River (67° 41' N, 102° 11' W) and is used for approximately 10 days in mid July.

Access to the study area is by air, either fixed-wing (twin otter) or helicopter, depending on the time of year. Helicopters are used for surveys within the Sanctuary, occasionally to deliver ground crews to remote areas of the colony, and to capture flightless geese. Snow machines are used early in the field season, prior to arrival of geese.

Small boats fitted with 16 hp outboard motors and canoes are used to traverse Karrak Lake, as well as nearby Adventure Lake. The main mode of transportation, however, is on foot.

Water is used for domestic purposes only, and is generally less than 20 gallons per day. Grey water is disposed of by soil leaching, at least 100 m from the nearest high water mark. Combustible waste is incinerated. Organic waste and ash from incinerated waste are buried in pits, at least 100 m from the nearest high water mark. Glass, metal, and other non-combustible waste is shipped to Cambridge Bay, Nunavut, or Saskatoon, Saskatchewan for disposal or recycling.