

TUNDRA SEABIRD AND NON-COLONIAL GOOSE ABUNDANCE

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PURPOSE

Predators may play a key role in the functioning of arctic tundra ecosystems and could potentially control the abundance of their prey. Avian predators, mostly raptors and seabirds, are the most diverse groups of predators in the Arctic and range from highly specialists to highly generalists. Measuring annual variation in their abundance is thus essential to understand trophic interactions in the tundra. The most accurate method to quantitatively measure their abundance is based on enumerating the number of active nests found over a pre-defined area. Defining the area to be searched is probably the most difficult decision to make, and this area will differ according to the species of interest. Difference in detection probabilities of nests among species is also a problem. Although statistical methods have been developed to tackle the latter problem (e.g. line transect methods), it is unlikely that these will be applicable here because of the low number of nests that we are likely to find in most areas. A second, simple method is also proposed as a relative index of annual and seasonal abundance of predators.

TIME PERIOD

On Bylot Island, the best period to conduct these surveys is from about 10 June to 10 July. Dates may need to be adjusted slightly at other sites depending of the latitude.

PROCEDURE 1 – NEST SEARCHES

All seabird species nesting on the tundra are of interest but those most likely to be encountered are:

- Long-tailed jaeger (LTJA)
- Parasitic jaeger (PAJA)
- Pomarine jaeger (POJA)
- Glaucous Gull (GLGU; see separate procedure below)
- Thayer's Gull (THGU; see separate procedure below)
- Sandhill crane ¹ (SACR)
- Short-eared owl¹ (SEOW)

Non-colonial geese also nest in the same type of habitat than the previous species and are thus included in this protocol. These species are:

- Canada goose (CAGO)
- Brant (BLBR)
- Greater white-fronted goose (GWFG)

All these species generally favour lowlands or very gentle slopes (gulls have more specific habitat requirements, and thus nest search for these species will be treated separately). As with raptors, one will have to define on a map the area of such habitat to be searched and measure its size. The relatively even topography of the habitat used by these species will allow more systematic searches than in the case of

¹ Short-eared-owl and sandhill cranes are included here because these predators nest in the same habitat than jaegers.

raptors. Nest searches of these species should be conducted along linear transects spaced out by ca 400 m. It is important to have a log of all transects that will have been searched for nests. The best way is to record a track of our walking path in a GPS, either by having the GPS continuously on during the searches or by recording points periodically. These tracks should be saved and later downloaded into a computer.

In polygon tundra, these species will prefer the dry ridges surrounding low-center polygons of the central, dry part, of high-center polygons. Jaegers, cranes and owls are inconspicuous as they do not add any nest material and egg color blends well with the surrounding. However, as with raptors, the behaviour of the species is usually a good indication of the presence of a nest nearby. All species will give alarm calls when people are at 100 m or more from their nest. Jaegers and owls will circle around the observer (the louder, the closer is the nest) whereas cranes will feign the broken wing and try to lure the observer away from the nest. Extensive searches of the area should be conducted when such nest defence behaviour is observed. Observations of these species along the transect may be frequent and do not need to be recorded. However, individuals exhibiting nest defence behaviour should be noted and the position recorded with a GPS. Even if the nest is not found, such cases will be counted as a nesting pair. All nests found should be positioned with the GPS and their content checked (see protocol on nest monitoring). We recommend using a standard notation to record nests of different species. This notation should be the 4-letter codes used by the bird banding laboratory to identify species followed by a number (e.g. LTJA01 for nest #1 of long-tailed jaeger). The official codes to used are provided with the species names above.

Geese rarely exhibit nest defence behaviours, except at hatch. In most cases, incubating geese will fly off their nest at some distance from the observer. Geese are relatively large birds and thus can often be seen at some distance, although dispersed nesting species are well camouflaged. Incubating birds have a typical, crouched position that is easy to distinguish from the one of a sitting, resting bird. The site from which a lone bird or a pair is seen flying off should be searched for the presence of a nest. Goose nests are more conspicuous than the one of other species because they are larger and they are lined with goose down. All nests found should be positioned with the GPS and their content checked (see protocol on nest monitoring). Eggs should be covered with down to minimize predation risk in the absence of the female.

All these species (except the owl) precocial birds (semi-precocial for jaegers) which mean that young leave the nest with their parents 1 or 2 days after hatch (a few days later for jaegers). Hence, nest found will be mostly at the egg stage. Young sometimes stay near the nest (especially jaegers) so it may sometimes be possible to find a newly hatched brood. These observations should be noted and the position of such broods should be recorded in the GPS.

Transects will need to be walked only once. However, if nest defence behaviour were observed but no nest was found, the site should be revisited at least once a few days later and searched again, especially if the same behaviours are observed.

Seabird or goose nests may sometimes be found outside the systematic procedure described above. Indeed, nests can be found opportunistically, e.g. during other activities in the field or by colleagues studying other species. We ask that anybody finding a nest of any of the species described below take the position with a GPS and report the observation to us. The information will be kept but we will indicate that the nest was found accidentally rather than during a systematic search.

Gulls

Gull nests are closely associated with ponds and lakes. Therefore, nest searches for these species should be concentrated in such habitats. Areas with ponds and lakes should be delineated on maps and their size measured. Nest searches should be conducted in these areas by walking along the shores of

lakes or through areas dotted with ponds. Gull nests are typically located in small islands in ponds or along the shore of those ponds, often on peninsula advancing in the water. Thus, all islands should be thoroughly scanned with binoculars for presence of nests.

As for other avian predators, gulls will start to fly and make alarm call around observers approaching their nest (100 m or more from the nest). Extensive searches of the area should be conducted when such nest defence behaviour is observed. Nests are easy to find as gulls typically build a mound made of mud, mosses and other vegetation, sometimes 30 cm high or more. These structures often last for many years and are reused in subsequent years. When parents have started incubation, they can be easily spotted on their nest from a distance, before they leave it to attack the approaching observer. Presence of feathers from prey remains around the nest is also an indication of an active gull nests. All nests found should be positioned with the GPS and their content checked (see protocol on nest monitoring). If a nest cannot be reached because it is located on an island, record the closest position possible and try to assess the content of the nest from the behaviour of the parents.

PROCEDURE 2 – VISUAL COUNT

This only concerns jaegers and gulls. See the raptor abundance protocol for details on this procedure.

MATERIAL

- Binoculars
- Map of the sector and field book
- GPS