

## **RAPTOR AND SEABIRD BEHAVIOURAL OBSERVATIONS**

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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. Quantifying their behaviour and hunting success according to the availability of their prey will help us better understand trophic interactions in the tundra. Knowledge of the behaviour of single species will also help us to understand better associated life history parameters. For avian predators, the most efficient way to collect these observations is at the nest of individuals. Time spent at the nest, activity during that period (e.g. brooding, incubating, etc), frequency of prey delivery, number and type of prey delivered, and nest predation event can all provide important data on foraging and nesting success of these predators. Two methods are proposed to collect these data: direct observations from a blind or the use of motion-sensitive automatic digital cameras. The latter method was tested on Bylot Island and proved reliable, thus providing an alternative for time-consuming focal observations.

### **TIME PERIOD**

The best time to collect behavioural data at raptor nests is during chick-rearing (i.e. after hatch) when parents are feeding young (15 June to end of July on Bylot Island). However, as males are also feeding incubating females, data on prey delivery rate of raptors can also be collected during this period (late May to late June). For seabirds, the best time to collect behavioural data is during chick-rearing (early July to mid August). Dates may need to be adjusted at other sites depending on the latitude and the bird species.

### **PROCEDURE**

All raptor and seabird species described in the abundance protocols are of interest. However, those most likely to be encountered are:

- Snowy Owl (SNOW)
- Rough-legged Hawk (RLHA)
- Peregrine Falcon (PEFA)
- Gyrfalcon (GYFA)
- Glaucous Gull (GLGU)
- Long-tailed Jaeger (LTJA)
- Parasitic Jaeger (PAJA)
- Pomarine Jaeger (POJA)

Focal observations on a nest by one immobile observer (hidden in a blind or, if not available, by topographical feature) should be done using both binocular and scope for at least 2 hour straight and up to a maximum of 8 hour (most frequently, for 4 to 6-h periods). The blind should be set at a distance that does not disturb the attending adults (usually 100 to 150 m). Because our aim is to record most activities occurring at the nest (and especially all arrival and departure of individuals from the nest, and all prey delivery events), it may be advisable to use a tape-recorder (an electronic one when possible) during the focal observation and to transcribe them later. At the beginning of the observation period, the observer should record the date, nest number, time of day, weather, temperature and details on the number of

eggs/chicks at nest, the presence of one or both parents (identify if it is the male or female whenever possible), the presence of prey material already at the nest. During the focal observation, any movements of adult birds (arrival and departure) should be recorded and time should be noted. Time spent at nest by each pair member will be used to assess intensity of nest attendance. Any interaction between individuals (intra or interspecific) should be noted as well. Each time an individual comes back to the nest, great attention should be placed on determining the presence of prey or not in their bill (or claws), how many, the identification of prey item, an approximate size (when possible), and what happened to the prey (i.e. left on the ground, fed to the attending parent, fed to the young, etc). Any other relevant information on individual behaviour such as parental care, chicks fighting etc. should also be noted.

Motion-sensitive automatic digital cameras (Reconyx “*Silent Image PM35T25*” or equivalent) can be used when available. They should be placed on a short tripod anchored to the ground 5 to 15 m from the nest to avoid disturbing the birds. Cameras should be set to take a picture of the nest when any movement at nest is perceptible. Those cameras have a wake-up time of 1/5 to 1/10 of a second and take 5 pictures per second. Cameras should be visited every 2-4 days to download pictures, change batteries, reset the memory card, and move them among nests. Pictures display time of day, so it is possible to evaluate the proportion of time a given bird is away or present at nest. Cameras should not be set too far from nest because zooming in on pictures does not reveal great definition, therefore preventing the identification of prey item. The size of individual nests should be measured to help the observer to infer the size of prey items brought back to the nest on pictures.

Individual nests are the sampling unit, not individual observation session. Hence, it is recommended to collect data at as many nests as possible. Normally, a camera should not be left at a nest for more than 4 consecutive days (unless no other nests are available for observations at that time). Similarly, blinds should be frequently moved among nests. However, because we want to measure seasonal change in prey delivery rate, it is fine to return to a nest previously sampled if all available nests have been observed once (i.e. if we are short on nests, it is better to have repeated observations of the same nest rather than no data at all!).

Cameras should be preferred in situation with uneasy access and where limited time needs to be devoted. In contrast, focal observation should be preferred when setting up a blind for future capture and when nests have an easy access.

## **MATERIAL**

- Map of the sector and field book
- GPS
- Blind
- Scope / binoculars
- Tape recorder
- Reconyx “*Silent Image PM35T25*” cameras with tripods and memory cards (1 or 2 Go)
- AA batteries

## **DATA MANAGEMENT**

Every focal observation should be accompanied with the observer’s name and the nest number. It is important to identify the observer of each observation session data as researchers should test for any observer’s bias prior to analyses. Every set of pictures downloaded from the cameras should also be identified to a given nest number and any details on the functioning (stopped because of battery failure, memory card full...) should be noted.