

Spatial variability in resource use by arctic-nesting Peregrine falcons (*Falco peregrinus tundrius*)

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INTRODUCTION

Understanding the mechanisms linking the environment to wildlife populations is difficult because a large number of parameters may affect growth, survival and reproduction of organisms. In this project, we study the breeding ecology of a dense population of peregrine falcons (*Falco peregrinus tundrius*) nesting in the surrounding of Rankin Inlet, Nunavut (62°N, 95°W). As the productivity (i.e. total number of young produced per year) of this population has greatly varied throughout the last decades (since 1981) (see fig. 1), we investigate the mechanisms driving breeding success of these arctic-nesting predators. In order to better identify the factors affecting productivity, we first describe the spatial and temporal variation in diet in terms of prey consumed by nestlings during chick rearing period for nest located on three habitat type (i.e. island, coast or inland) (see map below).

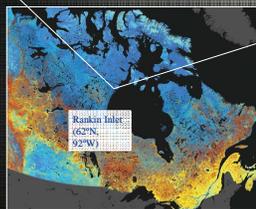


Figure 1 – Number of young peregrine falcons banded (productivity proxy) in Rankin Inlet from 1981 to 2008

OBJECTIVES

- 1) Determine the relative contribution of prey items to chick's diet at habitat scale within Terrestrial, Coastal and island nesting habitat
- 2) Evaluate the relative contribution of prey items to chick's diet at sites scale and analyse the overall occurrence of food delivery events

STUDY AREA



Semi-Palmated Plover
(*Charadrius semipalmatus*)



Arctic ground squirrel
(*Spermophilus parii*)



Common eider
(*Somateria mollissima*)



Black guillemot
(*Cepphus grylle*)

Terrestrial

Marine

METHOD

- Obj.1** We collected prey remains and regurgitation pellets in every active nest on a weekly basis throughout the chick rearing period (11th of July to 20th of August).
In laboratory, about 500 remains and pellets have been analysed (mean of 10 samples per site per collect period) and their content has been identified to functional group level (passerines, shorebirds, ducks, alcids, lemmings, squirrels).
- Obj.2** We deployed four digital scouting cameras on nesting sites. The automatic triggered function has been set on cameras which collected more than 40 000 pictures per site during summer, showing an average of 150 feeding sessions during chick rearing.

RESULTS

Pellet remain analysis

- Terrestrial prey items (e.g. lemming, squirrel, passerine) have been used by falcons nesting in every kind of habitat and seem to represent the bulk of young falcon's diet (Fig.2 A, B and C).
- Marine prey items (e.g. alcid and marine duckling) have been used mostly by falcons nesting on coastal and insular nesting habitat in low to medium proportion (Fig.2 B and C).

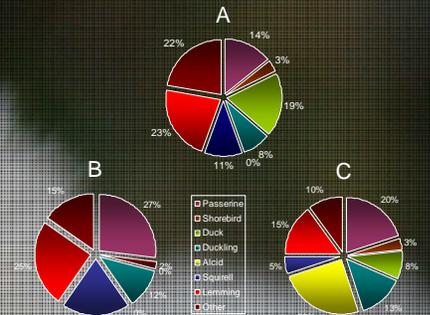


Figure 2 – Proportion of different preys consumed by young falcons within nests located in A) terrestrial (n=5), B) coastal (n=5) and C) insular (n=7) habitats during chick rearing determined by pellet-remain analysis method

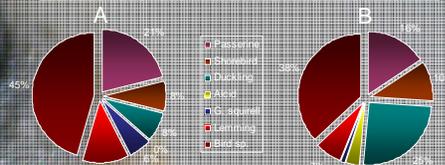


Figure 3 – Proportion of different preys consumed by young falcons within nest located in A) terrestrial (n=1) and B) insular (n=3) habitats during chick rearing determined by digital scouting cameras method

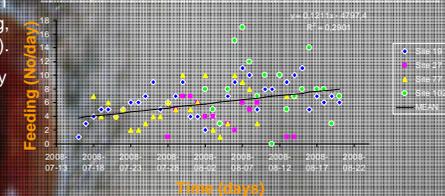


Figure 4 – Overall (n=4) feeding frequency for young falcons during chick rearing period

DISCUSSION AND FUTUR WORK

Both methods had demonstrated spatial variability in terms of preys delivered to young peregrine falcons by parents during chick rearing period within different nesting habitat. That trend could be explain by the local availability of preys in the vicinity of nesting ledge but that hypothesis remain to be tested. However, the fact that falcon nesting in any habitat make use of terrestrial prey items illustrate the importance of the terrestrial ecosystem for breeding peregrine. These preliminary results give first insights on individual's resource used and will be useful for further analysis such as Stable Isotope Analysis (SIA) as they provide a priori information that may be included in models. The next step will be to relate the individual variability in diet with annual productivity of individuals in order to determine the importance of resource used on breeding success of arctic-nesting peregrine falcons.

