Writing outline

### Introduction

Effective wildlife management requires a thorough understanding of species’ diet and its consequences for population demographics. Species with a narrow, specialized diet are more sensitive to changes in prey abundance than those with a wide, diverse diet, and as a result may be prone to population instability and more vulnerable to population declines. For a generalist predator, a wide range of available prey species reduces the likelihood that prey species will fluctuate synchronously, and increases the predator’s ability to switch from a less abundant prey to a more abundant one. However, a single species or small suite of species may still serve as the primary driver of population demographics.

Where populations are food-limited, increasing prey abundance or accessibility may prove an effective management strategy. Management guidelines developed for the northern goshawk in the American Southwest identified 14 important prey species and included recommendations to manage forests as a mosaic of differently-aged stands and small openings for their benefit in addition to managing forests for the direct benefit of goshawks themselves.

However, prey species may vary significantly across the range of a predator with a wide geographic distribution. In the American Southwest, goshawks have access to a wide prey base and fluctuations in goshawk productivity are small and driven primarily by the abundance of red squirrel (*Tamiasciurus hudsonicus*). In the Yukon, on the other hand, goshawks have a much narrower prey base and show strong variations in productivity, space use, and dispersal in response to populations of snowshoe hare (*Lepus americanus*), which are their main prey.

At smaller scales, habitat type affects local patterns of abundance. The effects of small- and large-scale landscape patterns, transmitted through prey resources, can influence population demographics.For such a generalist predator, management guidelines, especially those which incorporate management for prey species and foraging habitat, must take local diet into account.

The northern goshawk is a forest-dwelling raptor with a Holarctic distribution and a generalist diet. In North America, the species is associated with mature conifer forest, breeding in closed-canopy stands with large trees and limited understories. Widespread habitat loss, primarily due to timber harvest, raised concerns that the species may be declining. In British Columbia, the coastal population of northern goshawks is the focus of federal and provincial management efforts, which currently do not include recommendations for foraging habitat management or the management of prey species. While goshawks in this region are known to consume a wide range of birds and small mammals, their diet has never been quantified. One objective of this study was therefore to quantify goshawk diet at the nest during the breeding season. Furthermore, there is no information on how goshawk diet changes at small and large scales in response to different habitat types across this ecologically diverse region. A second objective was therefore to identify which landscape characteristics are correlated with variation in breeding season diet. Finally, the consequences of habitat-driven variation in goshawk diet may have a significant–or a negligible–affect on goshawk productivity. The third objective was therefore to determine whether occupancy and reproductive success vary with diet and landscape characteristics.

### Study area