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PREFACE RAPTOR RESPONSES TO FOREST MANAGEMENT: A HOLARCTIC PERSPECTIVE

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Forest raptors are one of the most sensitive groups of vertebrates to forest management and forest habitat change due to their position at the top of the forest food chain, their relatively large territories and home ranges, and their historical persecution by man (Fuller 1996). The highly visible case of the Spotted Owl (*Strix occidentalis*) controversy in the northwestern U.S. exemplifies many issues and conflicts between forest use and the need for appropriate ecological management for forest-dependent organisms (Yaffee 1994). Conflicts between forest resource use and the management or preservation of forest areas can be minimized with appropriate knowledge and understanding of how species respond to forest change (e.g., through logging, natural disturbance or succession). With this increased understanding, we can modify forest management to provide a sustainable harvest, yet ensure that we protect biological diversity and the fundamental processes of forest systems.

With this philosophical perspective, we embarked on organizing a symposium focused on selected raptor species of northern temperate and boreal forest habitats. The focus of the symposium was to summarize our current understanding of forest raptors with holarctic distributions—those with distributions in the temperate and boreal regions of North America and northern Europe. The symposium focused on six species with holarctic distributions: Osprey (*Pandion haliaetus*), Northern Goshawk (*Accipiter gentilis*), Long-eared Owl (*Asio otus*), Boreal/Tengmalm's Owl (*Aegolius funereus*), Northern Hawk Owl (*Surnia ulula*) and

Great Gray Owl (*Strix nebulosa*). For each of these species, two individuals (one from North America and one from northern Europe) were selected based on recommendations from a variety of raptor experts. Each of the individuals selected made a presentation at the symposium and those papers completing the peer-review process are included here.

SYMPOSIUM ORGANIZATION AND QUESTIONS POSED TO AUTHORS

The focus of each paper was on forests, forest management and how the ecology of each species relates to these issues. Each author was asked to address or consider the questions below. Because solid quantitative information was lacking for many questions, the presenters were invited to use educated guesses and common sense. Hence, if statements in the papers are not supported with data or references, then it is likely that the author did not use such empirical information. This is highly appropriate because in many cases a scientist has worked a lifetime with a species and has accumulated considerable knowledge on how a species may respond to forest management.

Questions:

- (1) Using the best available knowledge, what is the present population trend of the species over the past 10 yr, 25 yr, 50 yr and 100+ yr?
- (2) What are the primary factors associated with these trends? Factors such as food supply, habitat availability, chemical effects, human persecution, interspecific interactions and modern forestry practices should be discussed in the context of these trends.

(3) If modern forestry is associated with these trends, then how has the species been affected by either past or current management practices? Among additional factors to be considered were riparian zone management and secondary effects of logging on water quality (e.g., nonpoint source pollution).

(4) There are many ways that logging and forest management can affect forest raptors. Among these the following should be considered. (a) How would the species be affected by cuts of different sizes such as 1–3 ha cuts, 10–20 ha cuts, 20–100 ha cuts or cuts greater than 100 ha? (b) How would the species be affected by cuts of different shape? Assume that shapes vary from the simplest shapes, such as circular or square cuts, to those that are infinitely complex with convoluted edges. (c) What are the effects and what is the importance of leaving live trees, dead trees, shrubs or patches of these vegetational forms or different species of trees (e.g., future snags) within cut areas? The responses of forest raptors to these alternative ways to log forests would be especially useful if considered in the context of mitigation strategies that would improve habitats and populations for the specific raptor species.

(5) What is an ideal mix and spatial distribution of forest cut sizes and shapes that would be both: (a) highly beneficial to the species and (b) highly detrimental to the species? For example, would small cuts of 1–3 ha of circular or square shapes with many dead trees remaining within the cuts be beneficial or detrimental to the species in comparison with large cuts of complex shapes with few residuals? Alternatively, how should cuts be grouped spatially within respective management areas such as distributed randomly or connected by corridors between uncut areas?

(6) Integrate the information available to the ex-

tent possible with specific management recommendations. In addition, speculate on similarities and differences in the species response to forest-management practices on the two continents. For instance, forestry has occurred in northern Europe for more than 100–300 yr, whereas forestry in North America is generally less than 100-yr old. Have there been any short-term evolutionary responses by the species to forest regeneration today versus how forests have regenerated in the past (e.g., forest regenerating following forest fire versus logged forests).

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