

# Guidelines for Raptor Conservation during Urban and Rural Land Development in British Columbia (2013)

A companion document to *Develop with Care 2012*







## Acknowledgements

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i Manning, Cooper and Associates 2003



## Preface to the 2013 Edition of Guidelines for Raptor Conservation

This 2013 edition of Guidelines for Raptor Conservation (*Guidelines for Raptor Conservation during Urban and Rural Land Development in British Columbia 2013*) is a companion document to *Develop with Care 2012: Environmental Guidelines for Urban and Rural Land Development in British Columbia*. It is an updated version of *Best Management Practices for Raptor Conservation during Urban and Rural Land Development in British Columbia* (2005).

Changes to this version include the following.

- Species' status designations and taxonomic information have been updated
- Information in the Tables has been updated
- Regional discussions have been updated to reflect the boundaries of the eight Ministry of Forests, Lands and Natural Resource Operations (FLNRO) regions
- The range maps have been updated and revised in the species accounts, and photographs have been added for most species
- The *Raptor Webcam Guidelines in British Columbia* (2010) has been incorporated as an appendix to the document
- All hyperlinks, and references to British Columbia Ministries and documents, have been updated
- The document design has been modified to be consistent with *Develop with Care 2012*

We hope that readers will continue to find this a helpful resource.

**Note: Updates will be made to this document from time to time. The most recent version can be downloaded from the Guidelines website: [http://www.env.gov.bc.ca/wld/BMP/bmpintro.html#second\\_](http://www.env.gov.bc.ca/wld/BMP/bmpintro.html#second_)**



# Table of Contents

Acknowledgements .....	i
Preface .....	ii
<b>1 Introduction .....</b>	<b>1</b>
1.1 Raptors and Land Development .....	1
1.2 The Importance of Stewardship .....	1
<b>2 Purpose .....</b>	<b>3</b>
<b>3 How to Use This Document .....</b>	<b>4</b>
<b>4 Background .....</b>	<b>5</b>
4.1 What are Raptors? .....	5
4.2 Why Raptors are Important? .....	6
4.3 The Role of Local Government in Raptor Conservation .....	7
<b>5 Key Issues of Concern and Conservation Opportunities .....</b>	<b>9</b>
5.1 West Coast .....	10
5.2 South Coast .....	11
5.3 Thompson/Okanagan .....	11
5.4 Kootenay/Boundary .....	12
5.5 Cariboo .....	13
5.6 Omineca and Northeast .....	13
5.7 Skeena .....	13
5.8 Range-wide Concerns for Migratory Species .....	14
<b>6 Legal Requirements .....</b>	<b>15</b>
<b>7 How to Obtain Information on Raptors in your Area .....</b>	<b>17</b>
<b>8 Guidelines for Raptor Conservation .....</b>	<b>19</b>
8.1. Retain existing habitats and features; minimize loss of natural vegetation .....	29
8.2. Protect raptor nest sites .....	32
8.3. Protect raptor roosting/perching sites and foraging areas .....	34
8.4. Avoid disturbance of sensitive habitats during and after development .....	35
8.5. Manage, restore or enhance raptor habitat and features .....	36
8.6. Minimize the risk of accidental mortality .....	38
8.7. Avoid the use of pesticides and herbicides .....	39
8.8. Educate the public about the importance of maintaining raptors in urban and rural environments .....	39



<b>9</b>	<b>Monitoring and Reporting .....</b>	<b>40</b>
9.1	Why is monitoring necessary? .....	40
9.2	What is involved in setting up a monitoring program? .....	40
<b>10</b>	<b>Species Accounts .....</b>	<b>43</b>
10.1	Turkey Vulture ( <i>Cathartes aura</i> ) .....	44
10.2	Osprey ( <i>Pandion haliaetus</i> ) .....	47
10.3	Bald Eagle ( <i>Haliaeetus leucocephalus</i> ) .....	50
10.4	Northern Harrier ( <i>Circus cyaneus</i> ) .....	54
10.5	Sharp-shinned Hawk ( <i>Accipiter striatus</i> ) .....	57
10.6	Cooper's Hawk ( <i>Accipiter cooperii</i> ) .....	59
10.7	Northern Goshawk ( <i>Accipiter gentilis</i> ) .....	62
10.8	Swainson's Hawk ( <i>Buteo swainsoni</i> ) .....	64
10.9	Red-tailed Hawk ( <i>Buteo jamaicensis</i> ) .....	66
10.10	Golden Eagle ( <i>Aquila chrysaetos</i> ) .....	69
10.11	American Kestrel ( <i>Falco sparverius</i> ) .....	72
10.12	Merlin ( <i>Falco columbarius</i> ) .....	75
10.13	Peregrine Falcon ( <i>Falco peregrinus</i> ) .....	77
10.14	Prairie Falcon ( <i>Falco mexicanus</i> ) .....	81
10.15	Barn Owl ( <i>Tyto alba</i> ) .....	82
10.16	Flammulated Owl ( <i>Otus flammeolus</i> ) .....	85
10.17	Western Screech-Owl ( <i>Megascops kennicottii</i> ) .....	86
10.18	Great Horned Owl ( <i>Bubo virginianus</i> ) .....	89
10.19	Northern Pygmy-Owl ( <i>Glaucidium gnoma</i> ) .....	91
10.20	Burrowing Owl ( <i>Athene cunicularia</i> ) .....	94
10.21	Spotted Owl ( <i>Strix occidentalis</i> ) .....	96
10.22	Barred Owl ( <i>Strix varia</i> ) .....	98
10.23	Long-eared Owl ( <i>Asio otus</i> ) .....	100
10.24	Short-eared Owl ( <i>Asio flammeus</i> ) .....	102
10.25	Northern Saw-whet Owl ( <i>Aegolius acadicus</i> ) .....	105
10.26	Other Species .....	108



<b>Glossary .....</b>	<b>117</b>
<b>References .....</b>	<b>119</b>
<b>Additional Information Sources .....</b>	<b>127</b>
<b>Appendix A Legislation .....</b>	<b>131</b>
<b>Appendix B Raptor Webcam Guidelines .....</b>	<b>137</b>

## Tables

Table 1: Summary of guidelines intended to help conserve raptors in urban and rural environments .....	20
Table 2: Occurrence and timing of nesting by raptors in each region of the province .....	24
Table 3: Provincial conservation status .....	26
Table 4: Important features of raptor habitat and the values they confer .....	29
Table 5: Raptor species likely to benefit from the protection of key habitat features in British Columbia .....	31
Table 6: Recommended minimum buffers for nesting raptors .....	33



*Osprey and nest.*

Photo: Ministry of Environment





# 1. Introduction

## 1.1 Raptors and Land Development

Many species of **raptors**<sup>6</sup> (birds of prey) have been adversely affected by urban and rural land development in British Columbia (B.C.).<sup>7</sup> However, many raptors can coexist with people in human-modified landscapes if certain habitat needs are met. *Guidelines for Raptor Conservation* was produced to assist local government staff, the development community, and landowners with the conservation of raptors and their habitats in urban and rural areas of British Columbia. It is a companion document to the B.C. Government's [\*Develop with Care 2012: Environmental Guidelines for Urban and Rural Land Development in British Columbia\*](#).

Raptors occur in nearly all terrestrial habitats of British Columbia. They are recognized as an integral part of B.C.'s ecosystems and are legally protected. In British Columbia, conflicts between habitat requirements of raptors and urban and rural developments have been frequent because the valleys and shorelines that are ideal for settlement are also important raptor habitat. Logging, agriculture, urbanization, mining, and hydroelectric developments have greatly modified landscapes over large areas, often adversely affecting raptors. The cumulative effects of small-scale human activities, ranging from simple disturbance to cutting down a nest tree, can also reduce the abundance and number of species of raptors in an area. In many cases, critical habitat features required by raptors can be protected or restored during land development, so that opportunities to maintain or enhance raptor **biodiversity** in urban and rural environments can be optimized.

Preserving and managing raptor habitats within urban and rural landscapes benefits more than just the birds. Many of the habitat features required by raptors add aesthetic and market value to real estate developments, and the presence of wildlife, including raptors, enhances the quality of life for residents (see **Section 4.2** for more information on the ecological and social values of raptors).

## 1.2 The Importance of Stewardship

British Columbia is recognized globally for its exceptional wildlife, diversity of ecosystems and rich natural resources. These valuable natural assets provide the essentials of life, as well as recreational activities and economic opportunities that are enjoyed by British Columbians throughout the province. However, rapid urbanization, especially in the southern areas of the province, has resulted in significant impacts on the natural environment, including an increase in the numbers of plant and animal **species 'at risk'**, and a declining community livability.<sup>8</sup>

The term "raptor" is derived from the Latin word *rapere* (meaning to seize or take by force)

Birds of prey have very good eyesight for locating food, strong feet and sharp talons for catching, holding and killing prey, and a strong curved beak for tearing flesh. They often prey on vertebrates, which are usually quite large relative to the size of the bird. Many also scavenge carrion (animal carcasses) at least occasionally.

A healthy natural environment is the foundation of British Columbia's economy and quality of life. We—governments, the private sector, and civil society—all have a part to play in its protection.

<sup>6</sup> Words in **bold red** are defined in the **Glossary**

<sup>7</sup> Campbell et al 1990

<sup>8</sup> [Ministry of Environment 2007](#)

### Results-based Approaches

It is recognized that the 'best' practice for a given location may vary. A results-based approach benefits land developers by allowing them the opportunity to use creative approaches to meet the Province's environmental standards. This model relies on the professional accountability of qualified professionals and the attendant codes of practice and ethics of their governing bodies. An approach designed for a specific location may be less expensive and/or less time-consuming for the developer and approval agency; however, in taking on this responsibility, land developers and approval agencies will also take on risk and should identify and develop strategies for managing it. When land development is not properly planned and implemented, the developer's risks could include increased costs, delays, or legal consequences. Local governments could face impacts on existing municipal infrastructure and quality of life for residents, and may also risk legal consequences. In addition, long-term environmental impacts may occur.

*Guidelines for Raptor Conservation* empowers British Columbians to achieve excellent environmental stewardship and sustainability during land development. The **guidelines** are based on science and experience, and build on the leadership being shown by many local governments and developers to create sustainable communities and developments.

The guidelines are part of a results-based approach to land use decisions (see box). Decisions regarding environmental protection and stewardship are prescribed in a variety of provincial and federal legislation and regulations (see summary in **Appendix A**). In addition to these mandatory requirements, the Province sets out objectives that local governments and the development community are expected to meet. However, the way in which those objectives are met are often best decided at a local or site level, hence they are not prescribed in legislation.

The guidelines are based on current science and staff expertise and experience. If local governments and developers are faced with legal action, they may be expected to demonstrate that they have used **due diligence** to avoid or mitigate environmental problems created by land development activities. Demonstrating that they have followed the guidelines provided in this document will strengthen this due diligence defence.

*The Bald Eagle is an impressive raptor often seen as symbol of power and freedom. It nests in large trees close to fish-bearing waterbodies and prefers undisturbed foraging areas free of harassment by humans and pets.*

Photo: ©Jared Hobbs





## 2. Purpose

This document provides guidance to help maintain raptor populations and their habitats during and after land development in urban and rural environments. The information is pertinent to all regions of British Columbia, and in particular to southern areas of the province where urbanization and other developments have greatly reduced the quantity and quality of raptor habitats. It is intended to be useful to local governments, land developers, naturalist groups and other non-government organizations (NGOs), and individual landowners; providing non-biologists with a basic understanding of raptor conservation and the tools available to help maintain raptor populations and to protect, restore, or enhance their habitats. *Guidelines for Raptor Conservation* will also be of interest to biologists and scientists, but it is not meant to be a comprehensive treatise on the ecology and conservation of raptors in British Columbia. Readers are also strongly encouraged to look at the guidelines provided in [Develop with Care 2012](#).

This document aims to:

- Explain what raptors are, their value to society, and the roles they play in ecosystems (**Sections 4.1 and 4.2**);
- Explain why it is important for local governments and the development community to participate in the shared stewardship of the environment and to incorporate raptor conservation measures in urban and rural land development (**Sections 4.2 and 4.3**);
- Describe the roles and responsibilities of local governments, developers, and the public in the shared stewardship of raptors and their habitats (**Section 4.3 and Section 6**);
- Describe the key issues and opportunities for raptor conservation in urban and rural areas in each region of the province (**Section 5**);
- Describe guidelines that help to maintain raptor populations in urban and rural environments and to protect or restore key habitat features during and after land development (**Section 8**);
- Provide monitoring strategies for the Provincial Government, local governments and non-government organizations to see if guidelines are being followed and to determine if they are effective in maintaining raptor populations and habitats (**Section 9**);
- Provide current information on raptor ecology, breeding location, and conservation status (**Section 10**); and,
- Describe the relevant provincial and federal legislation that protects raptors and their habitat (**Section 6 and Appendix A**).

Other documents in the Guidelines and Best Management Practices series from the Province of British Columbia can be found at <http://www.env.gov.bc.ca/wld/BMP/bmpintro.html>



*In contrast to most owls, the Northern Pygmy-Owl (shown holding a mouse) commonly hunts during the day. It nests in tree cavities such as those created by woodpeckers.*

Photo: ©Jared Hobbs



### 3 How to Use This Document

This document provides easy-to-follow guidelines and measures to help ensure that developments in urban and rural areas are sensitive to the ecological needs of raptors. In many cases, a developer or landowner can make a significant contribution to the biodiversity of an area if these guidelines are followed. There are also limitations to this guidebook. Interactions of raptors with their environment, including human developments, are very complex, and the measures presented in this document should not be viewed as a comprehensive description of all possible management actions. For large or complex projects, a developer is encouraged to seek advice from a **professional biologist** with expertise in raptors.

The document is organized as follows:

- Important background information is presented in **Sections 1 through 5**.
- **Section 6** summarizes legal requirements and limitations pertaining to raptor habitat protection in British Columbia.
- **Section 7** suggests ways to find local information on raptors;
- Guidelines intended to protect, enhance or restore raptors and their habitats in urban and rural environments are presented in **Section 8**.
- Recommended **monitoring** and reporting strategies to evaluate the effectiveness of guidelines are presented in **Section 9**.
- Species accounts in **Section 10** provide information on the life history and conservation status of the raptors of British Columbia.
- Important technical terms are highlighted within the body of the text and defined in the **Glossary**.
- Scientific information upon which this document is based is presented in **References**, while **Additional Information Sources** lists some online information, covering a wide range of raptor-related topics.
- **Appendix A** provides a summary of pertinent legislation.
- **Appendix B** is the Raptor Webcam Guidelines.



## 4. Background

### 4.1 What are Raptors?

Raptors are predatory birds including eagles, hawks, falcons, and owls. The term “raptor” is from the Latin word *rapere* meaning “to take by force”. Predators kill the animals they eat. Scavengers find and eat animals that are already dead or nearly dead. Raptors typically hunt and kill their prey, though some species regularly scavenge too. An example is the Bald Eagle, which commonly kills birds and fish, but also feeds on the dead and dying bodies of spawned-out salmon. Raptors are equipped with sharp talons (claws) and a hooked beak that assist them in their predatory way of life. Sharp talons assist with the capture and holding of prey, while the beak helps tear flesh and other tissues.

Falcons, hawks, vultures, and eagles are active primarily during daylight hours, whereas owls are mainly active at night. However, there are exceptions to this pattern, since the Northern Pygmy-Owl, Northern Hawk Owl, Snowy Owl, and Short-eared Owl may be seen during the day.



*Fish-bearing lakes, large trees near the shoreline, and coniferous woodlands provide raptors and their prey with important habitats.*

Photo: ©LGL Limited



*Barn Owls often nest in old farm buildings in agricultural areas. They consume large numbers of small mammals such as voles, mice, rats, and shrews.*

Photo: ©Jared Hobbs





## 4.2 Why are Raptors Important?

Raptors play important roles in ecosystems and are valued by society in several ways:

- **Aesthetic Values**—*A species' natural beauty and artistic appreciation.* Raptors have many attributes admired by the public including a striking, noble appearance, remarkable flying ability, and keen senses. The aesthetic values of raptors are often portrayed in the work of artists and photographers.
- **Spiritual Values**—*A species' relation with and role in human culture, spanning scales ranging from an individual to an entire society.* Bald Eagles, Golden Eagles, and other raptors play a significant spiritual role in many native North American societies. Throughout history, raptors have been an emblem of strength, courage, and freedom, and are frequently the namesake of sports teams, automobiles, and aircraft. Humans first landed on the moon in a [module named "Eagle"](#). By viewing wild raptors in urban and rural areas, people are able to maintain an important psychological connection with nature.
- **Recreational Values**—*Qualities stemming from recreational pursuits associated with the species.* Economic and non-economic aspects are included. Examples of recreational values of raptors include bird-watching and falconry. Raptors are renowned for their ability to attract bird-watchers (e.g., the annual gathering of [Bald Eagles of Brackendale](#), British Columbia and concentration of migrating Turkey Vultures at Beechy Head on the southern tip of Vancouver Island). Falconry involves humans training raptors to hunt for them, either recreationally to capture food (e.g., waterfowl, rabbits) or commercially to assist with nuisance animal control efforts. Today, most falconers use captive-bred birds.
- **Educational and Scientific Values**—*The study of raptors allows a better understanding of the world around us.* This understanding may simply add to our knowledge base or be used to improve the quality of human life and ecological conditions. Because of their top position in the food chain, raptors serve as barometers of environmental change and overall ecosystem health. They typically require large areas and healthy prey populations for survival. As such, measures that conserve raptors can provide an umbrella of protection for many other plant and animal species. The quality of raptor health is a measure of environmental health. For example, environmental contamination with DDT resulted in adverse effects on many species of raptors. By discontinuing the use of that pesticide to conserve raptors (and other species), environmental conditions for humans and other animals have improved.
- **Ecological Values**—*The roles that species play in the ecosystems they occupy.* Raptors consume a wide variety of prey including small mammals, birds, reptiles, amphibians, fish, and insects. Hence, they play a role in regulating prey populations and in nutrient cycling. Raptors are also important components of biological diversity. The variation among different species and the genetic variation within individual species of raptors (i.e., the "gene pool") contribute to the biodiversity of a region. Because research into raptors is ongoing, the full



*Northern Saw-whet Owl.*

Photo: Berry Wijdeven



range of ecological values will not likely be known for many years. Thus, it is prudent to conserve raptors to retain both their known and presently unknown ecological values. Such an approach follows the **precautionary principle**.

- **Economic Values**—*How raptors affect the lives and livelihoods of people.* By helping to control prey populations, raptors can directly benefit humans by reducing pest species (many of which are non-native) such as rats, mice, rabbits, starlings, house sparrows, pigeons, and grasshoppers. Eagles and vultures help reduce the spread of disease by cleaning up dead and rotting animal carcasses. Travelling birdwatchers spend considerable amounts of money on food, drink, lodging, gasoline, and other local services. Raptors are highly sought by birders and communities with large raptor populations can benefit economically. The [Bald Eagles of Brackendale](#) near Squamish are a significant source of tourist revenue for the surrounding community. The presence of raptor habitat (e.g., wooded areas, wetlands, old fields) can add to the economic value (marketability) of a property. Falconers use raptors to scare other birds from airports to reduce the risk of birdstrikes and aircraft damage, reduce crop damage, disperse pest species at landfills, and reduce pollution of urban parks by keeping geese away from sports fields and swimming beaches.

Local governments are well positioned to conserve raptors using provisions in the [Local Government Act](#) and [Community Charter](#)

### 4.3 The Role of Local Government in Raptor Conservation

Current provincial legislation protects birds, their nests, and their eggs, but provides little direct protection for their habitats—especially for nest sites on private, municipal, and regional lands. This poses a problem for raptors in urban and rural environments where most land is privately owned. So, while the Province retains jurisdiction over raptors in British Columbia, local (municipal and regional) governments are often in a better position to serve as stewards of raptor habitat in urban and rural areas. Through the [Local Government Act](#) and [Community Charter](#),



local governments are empowered to regulate development within their jurisdiction. The role of local governments in the maintenance of raptor populations is vital because much of British Columbia's best land for development also contains critical raptor habitat used for breeding, migrating/staging, and wintering. This overlap typically occurs in the lowlands and valley bottoms, which contain productive raptor habitats. Such land is relatively rare in British Columbia; a province dominated by high, rugged mountains with harsh climates and limited food supply for raptors.

Many opportunities exist for local governments to protect raptors and their habitats.

- Local development regulations and guidelines can be adopted based on information obtained by identifying and mapping important raptor habitats, which can be carried out together with other governments and NGO groups. This approach not only benefits raptors, but it also provides developers with a degree of understanding and certainty regarding what developments might be acceptable in a given area, so saving time and money for developers.
- Official Community Plans (OCPs) can be used to delineate Urban Containment Boundaries, Environmentally Sensitive Areas, and Development Permit Areas. Zoning can dictate acceptable land uses and by-laws can provide habitat protection (e.g., stream setbacks and wildlife tree protection). OCP policies can be used to protect important raptor habitat features, including nest sites, foraging areas, roosting sites and surrounding protective buffers.
- Local governments can facilitate the establishment of Conservation Covenants, which protect habitats. Density transfers and density bonuses can be used to reduce urban sprawl and allow the establishment of wildlife conservation zones.
- As guided by this document and/or as assisted by expert advice, local government staff unfamiliar with raptor ecology can gain confidence to assess, amend, approve, or reject a development application.

Further information on how local governments can help conserve wildlife habitats and natural ecosystems is presented in [\*Develop with Care 2012: Environmental Guidelines for Urban and Rural Land Development in British Columbia\*](#) and [\*Nowlan et al. \(2001\)\*](#). Henigman (2004) describes in detail how local governments can protect raptor nest sites, using Bald Eagle nest trees on Vancouver Island as an example.





## 5. Key Issues of Concern and Conservation Opportunities

A major threat to raptor habitat in British Columbia is the large-scale conversion of agricultural lands and natural areas to land uses that typically involve impermeable surfaces (e.g., pavement and asphalt) and buildings. Between 1996 and 2006, the total area of urban land in B.C. increased from about 2,900 km<sup>2</sup> to 3,400 km<sup>2</sup>,<sup>4</sup> resulting in the loss or degradation of productive agricultural land, valley bottom habitats, and greenspaces. Intensive agricultural practices, such as expansive greenhouse developments, are also reducing raptor habitats. The Lower Fraser Valley and Delta traditionally supported some of the highest densities of wintering raptors in Canada,<sup>5</sup> but populations and habitats have been greatly reduced as a result of human activities over the past century. Development continues in this area of rapidly expanding human population, further shrinking habitats for raptors and other wildlife. The situation unfolding in the Fraser Valley and Lower Mainland is being repeated throughout urban and rural areas of the province, particularly southern and eastern Vancouver Island and the Southern Interior valleys of British Columbia, albeit on smaller scales.

The future of raptor populations in British Columbia depends on actions taken now. Improved urban development planning to conserve raptor habitats is a crucial part of raptor conservation in British Columbia.

The discussion below identifies issues in the various regions of the province (the eight regions of the Ministry of Forests, Lands and Natural Resource Operations, see map on following page).

*The Merlin sometimes breeds and forages in urban and rural environments, provided large nest trees, old fields and shrubby areas are available.*

Photo: ©Jared HobbsCompany



<sup>4</sup> [Statistics Canada](#)

<sup>5</sup> Butler and Campbell 1987

## Map of Ministry of Forests, Lands and Natural Resource Operations Regions



### 5.1 West Coast

The main threats facing raptors in the West Coast Region are urbanization, agriculture, and forestry. Old-growth forests on Haida Gwaii, Vancouver Island, and the Mainland Coast have been depleted, especially at low to moderate elevations, and coastal habitats have been greatly modified. On southern and eastern Vancouver Island and the Gulf Islands, raptor habitats within low-elevation coastal ecosystems (Coastal Douglas-fir biogeoclimatic zone) have been significantly degraded by human developments. Raptor species most affected by these changes include the Northern Goshawk (coastal *laingi* subspecies), Peregrine Falcon, Merlin, Bald Eagle, and Western Screech-Owl.

Haida Gwaii supports high densities of Bald Eagles and Peregrine Falcons (*pealei* subspecies), and is the only place where the Northern Saw-whet Owl (*brooksi*



subspecies) can be found. Peregrine Falcons of the *anatum* subspecies are known to breed in the Gulf Islands.

Other raptors of concern on the west coast include the Northern Goshawk (*laingi* subspecies), which occurs only on the Haida Gwaii, Vancouver Island and along the mainland coast west of the coast mountains. Their habitats may be impacted by forest harvesting.

Species that are relatively compatible with human activity and are most likely to benefit from development guidelines in urban and rural environments include the Bald Eagle, Osprey, Cooper's Hawk, Red-tailed Hawk, Merlin, Great Horned Owl, Barred Owl, Barn Owl, and several small, cavity-nesting owls (Western Screech-Owl, Northern Saw-whet Owl, and Northern Pygmy-Owl). See **Table 3** (page 26) for more detail.

## 5.2 South Coast

As on Vancouver Island, the main threats facing raptors in the South Coast Region are urbanization, agriculture, and forestry. Old-growth forests have been depleted, especially at low to moderate elevations, and coastal habitats have been greatly modified. The Fraser River Delta is a nationally significant wintering area for many species of birds, including raptors. However, habitats in this area have been greatly modified and continue to be threatened by urbanization, land clearing, pollution and changing agricultural practices.

Raptor species most affected by these threats include the Spotted Owl, Northern Goshawk (*laingi* subspecies along the B.C. coast), Peregrine Falcon, Merlin, Bald Eagle, and Western Screech-Owl.

Species that are relatively compatible with human activity and are most likely to benefit from development guidelines in urban and rural environments include the Bald Eagle, Osprey, Cooper's Hawk, Red-tailed Hawk, Merlin, Great Horned Owl, Barred Owl, Barn Owl, and several small, cavity-nesting owls (Western Screech-Owl, Northern Saw-whet Owl, and Northern Pygmy-Owl). See **Table 3** (page 26) for more detail.

## 5.3 Thompson/Okanagan

In the Thompson/Okanagan region, low elevation valley bottoms and riparian habitats are diminishing due to urbanization and changing land uses. Wildlife habitats in the Okanagan and Similkameen Valleys are particularly at risk due to a rapidly increasing human population and conversion of productive wildlife habitats into vineyards and orchards. Riparian and wetland habitats and Antelope Brush ecosystems are severely threatened in these areas. Forestry, ranching, and tourist developments in these regions also have altered large areas of both grassland and forest habitats. Greatest concerns for raptors in these regions include shortage of



*The Western Screech-Owl (shown here), a secondary cavity nester, often uses thickets and riparian areas for roosting and nesting. The larger Barred Owl is expanding its range in B.C. and may be partly responsible for recent declines in Screech-Owl numbers*

Photo: ©Jared Hobbs



tree cavities and undisturbed grasslands for nesting purposes and degradation of foraging areas.

Raptor species most affected by these threats include the Burrowing Owl, Western Screech-Owl (*macfarlanei* subspecies), Flammulated Owl, Short-eared Owl, Prairie Falcon, and Swainson's Hawk.

The varied habitats of the Thompson/Okanagan region including arid grassland, shrub lands, open forests, cliffs, lakes and riparian areas support a particularly diverse raptor fauna. The Burrowing Owl, Western Screech-Owl (*macfarlanei*), Flammulated Owl, Swainson's Hawk, and Prairie Falcon are unique to the region or occur only occasionally elsewhere in the province. Species that are relatively compatible with human activity and are most likely to benefit from guidelines in urban and rural areas include the Osprey, Bald Eagle, Great Horned Owl, Barred Owl, Long-eared Owl, Cooper's Hawk, Sharp-shinned Hawk, Red-tailed Hawk, Swainson's Hawk, Merlin, American Kestrel, and several small cavity-nesting owls. The Western Screech-Owl and Flammulated Owl, in particular, would benefit from the protection and restoration of riparian and valley bottom habitats.

#### **5.4 Kootenay/Boundary**

Forestry, mining, and hydro-electric development have altered vast areas of raptor habitat in the region, although a considerable amount of natural habitat remains unaltered. Some valley bottom habitats have been altered by urbanization, agriculture, and forestry.

Species of concern in this region include the Peregrine Falcon and Northern Goshawk. Ospreys are common in the region, attracted to the many large fish-bearing reservoirs, lakes and rivers. They frequently use the cross-members of power poles and light standards for nesting, which can result in electrocution and can cause local



power outages. As a result, such nests may be relocated to adjacent safer sites, often using artificial nest platforms.

Species that are relatively compatible with human activity and are most likely to benefit from the development guidelines in the Kootenays include the Osprey, Bald Eagle, Great Horned Owl, Barred Owl, Cooper's Hawk, Sharp-shinned Hawk, Red-tailed Hawk, American Kestrel, and small, several cavity-nesting owls (Northern Saw-whet Owl, Boreal Owl, and Northern Pygmy-Owl).

## **5.5 Cariboo**

Forestry and ranching have altered raptor habitats over large areas of the Cariboo Region. Some low-elevation valley bottom habitats, especially within the Bunchgrass and Douglas-fir biogeoclimatic zones, are also affected by urbanization, but not to the degree of more southerly areas of the province. Wetlands and lakes are common in the region, but logging, ranching, and tourist developments are reducing the quality of shoreline habitats for raptors.

Raptor species of concern in the Cariboo Region include the Flammulated Owl, Peregrine Falcon, and Prairie Falcon.

Species that are most likely to benefit from the development guidelines include the Bald Eagle, Osprey, Great Horned Owl, Barred Owl, Long-eared Owl, Cooper's Hawk, Sharp-shinned Hawk, Red-tailed Hawk, Merlin, American Kestrel, and several small, cavity-nesting owls (Northern Saw-whet Owl, Flammulated Owl, Western Screech-Owl, Boreal Owl, and Northern Pygmy-Owl).

## **5.6 Omineca and Northeast**

Although vast areas of forest still occur in these regions, these habitats are being rapidly altered by forestry, oil and gas development and mining. Urbanization, ranching, agriculture, and hydro-electric developments have modified some river valleys, particularly the Peace River in the northeast. Species of concern in this region include the Peregrine Falcon and Northern Goshawk.

Species that are most likely to benefit from the development guidelines include the Bald Eagle, Osprey, Great Horned Owl, Barred Owl, Sharp-shinned Hawk, Red-tailed Hawk, Merlin, American Kestrel, and several small, cavity-nesting owls (Northern Saw-whet Owl, Northern Hawk Owl, Boreal Owl, and Northern Pygmy-Owl).

## **5.7 Skeena**

The Skeena Region is probably the least impacted by human activity in British Columbia. The remote, mountainous regions in the northwest support the highest concentrations of Golden Eagles and Gyrfalcons in the province.





Although the extent of urban and rural environments in the Skeena Region is limited, several species could potentially benefit from the development guidelines in these areas. These include the Bald Eagle, Osprey, Red-tailed Hawk, Great Horned Owl, Barred Owl, Western Screech-Owl, Northern Hawk Owl, Northern Pygmy-Owl, and Northern Saw-whet Owl.

### 5.8 Range-wide Concerns for Migratory Species

Some serious threats to raptors occur outside the province during migration and on wintering grounds; these threats are beyond the control of management efforts in British Columbia. For instance, a catastrophic [loss of Swainson's Hawks](#) occurred in Argentina (up to 5% of the worldwide population), as a result of pesticide use to control grasshoppers which form a major part of their winter diet. However, many raptors migrate through and winter in British Columbia where they are subject to a degradation of wintering and staging habitats, which can reduce their survival and ability to migrate and breed successfully. Being top predators in the food web, raptors are also very susceptible to pesticides, particularly to contamination by heavy metals and other chemicals that accumulate in their bodies. They are also susceptible to alterations of winter foraging habitat, harassment and poaching. Some migratory songbirds and shorebirds are also threatened by the degradation of wintering areas. Reduction in numbers of smaller birds affects the food supply of those raptors that feed on them.



*Bald Eagle feeding on seal carcass.*

Photo: Judith Cullington



## 6. Legal Requirements

Raptors and most other birds are protected in British Columbia under Section 34 of the [Wildlife Act](#). Under this Section, a person commits an offence if, except as provided by regulation, he/she possesses, takes, injures, molests or destroys a bird or its egg, or a nest that is occupied by a bird or its egg. Subsection 34 (b) provides protection year-round to the nests of the Bald Eagle, Golden Eagle, Peregrine Falcon, Gyrfalcon, Osprey, and Burrowing Owl, whether the nests are active or not. However, the habitat immediately surrounding the nest site (other than the nest tree), or habitats needed for foraging, roosting, or wintering, may not be protected unless they occur in a protected area such as a park. If it can be shown that an activity or development will “molest, injure or destroy” a nest site as defined by the *Wildlife Act*, protective buffers may need to be established to reduce disturbance of the nest, although the degree of protection required is not specified by the Act. This uncertainty regarding adequate habitat protection is necessary to allow the flexibility needed to manage each situation, as habitat requirements differ by species as well as by location, with urban nesting raptors being more tolerant of human activity than those that nest in rural or wilderness areas. This can have considerable implications for raptor conservation during urban and rural land developments, particularly on private land.

British Columbia laws can be accessed at <http://www.bclaws.ca/>

Federal laws are available at <http://laws-lois.justice.gc.ca/eng/acts/>

The *Wildlife Act* also gives the provincial government authority to protect habitat through the creation of [Wildlife Management Areas](#), designation of [Critical Wildlife Areas](#) (for threatened and endangered species), and creation of regulations governing use of land and wildlife. However, these provisions have limited applicability to urban and rural environments where the amount of provincial Crown land is limited.

The [Forest and Range Practices Act](#), [Park Act](#), [Protected Areas Act](#), and [Ecological Reserve Act](#) provide a considerable degree of habitat protection for lands designated under those Acts, but such Acts usually have little application in urban and rural environments. For example, the *Forest and Range Practices Act* provides some additional protection for raptors and other wildlife on provincial Crown lands where industrial forestry and/or cattle grazing are prevalent. These include the [Identified Wildlife Management Strategy 2004](#) (IWMS), which currently provide management measures for Northern Goshawk, (*laingi* subspecies), Prairie Falcon, Ferruginous Hawk, Western Screech-Owl (*macfarlanei* subspecies), Flammulated Owl, Spotted Owl, Short-eared Owl, and Burrowing Owl. The IWMS enables the creation of Wildlife Habitat Areas which conserve habitat for identified wildlife species. Some of these have been created for raptors including Spotted Owls, Western Screech-Owls, Flammulated Owls, and Northern Goshawks. Additionally, larger WHAs created for other non-raptors species (e.g., Marbled Murrelets) and Ungulate Winter Ranges (also created under FRPA), can also provide habitat protection for raptors; however, these do not usually occur in or near urban areas.

The [Environmental Management Act](#) and [Integrated Pesticide Management Act](#) provide legislation that prevents or minimizes exposure to toxins. The provincial and federal governments banned the use of lead shot for waterfowl hunting in British

### Species at Risk Act

Federal protection for raptors at risk under Schedule 1 of SARA, including their residences and critical habitats, is mandatory on federally-owned land (such as federal forestry lands, Indian Reserves, airport lands owned by Transport Canada, and military lands owned by the Department of National Defence). The goal of the *Species at Risk Act* is to prevent endangered or threatened wildlife from becoming extinct or lost from the wild, and to help in the recovery of such species. Those species listed as being of “special concern” will be managed so as to prevent them from becoming endangered or threatened.

Columbia, in part over concerns of lead poisoning in Bald Eagles that fed on waterfowl carrying shot in their bodies.

At the federal government level, raptor species officially designated as “at risk” are also protected under the *Species at Risk Act* (SARA). The role of the federal government in raptor conservation may expand beyond federal Crown lands, if ‘safety net’ legislation is imposed. Under this legislation, the federal Cabinet may, at the recommendation of the federal Minister of Environment, order that protective measures be applied to provincial lands as well as federal lands.

Due to the lack of protection of raptor habitats in urban and rural environments afforded by legislation at the provincial and federal levels, local governments and the development community have a vital role to play in the protection of raptor habitat and shared wildlife stewardship on private and municipal lands. As discussed in Section 4.3, the *Local Government Act* and *Community Charter* empower local governments to expand their role in conservation of raptors and other wildlife. The responsibility for stewardship will be shared among several parties, including the provincial government.

An expanded summary of provincial and federal legislation relevant to raptor conservation is presented in **Appendix A**.



*Fields or pastures, hedgerows, and tall trees in urban areas are commonly used by raptors.*

Photo: ©LGL Limited



*Wetlands, shrubs, conifers and deciduous trees provide important habitats for raptors and their prey in urban environments.*

Photo: ©LGL Limited





## 7. How to Obtain Information on Raptors in Your Area

Decisions on conservation issues require good information and judgement. Often raptor information already exists for a proposed development area, however, new nests are built each year and existing nests may be destroyed by storms and toppling trees. It is recommended that pre-development inventories be conducted for raptor nests and important raptor habitat features (see **Table 4**), especially in areas likely to be used by raptors for nesting (old-growth forest, older second-growth forest, riparian areas, and cliffs). Information on general habitat inventory and mapping is presented in *Develop with Care* ([Section 3.3](#) and [Appendix B](#)). Recommended provincial inventory techniques for raptors in British Columbia include the [Inventory Methods for Raptors](#) and [Inventory Dataforms for Raptors](#).

For information on raptors in your area, check the [Conservation Data Centre](#) website, [BC Breeding Bird Atlas](#) and [eBird Canada](#).

Several potential sources of information on raptors and their preferred habitats in your area are available. The following options are useful for accessing this information:

- Contact the B.C. [Conservation Data Centre](#)
- Use the B.C. [Species and Ecosystem Explorer](#) for lists of raptors in your area and for information on their status and ecology.
- Contact local naturalist, conservation and habitat stewardship groups; they can also refer you to knowledgeable bird-watchers who may have very specific information for your area.

Several wildlife or raptor-specific inventory databases are available, including the following:

- [Conservation Data Centre](#) database for raptors at risk
- [Sensitive Ecosystem Inventories](#)
- [SARA registry](#) for federally-listed species at risk
- [BC Breeding Bird Atlas](#)
- [eBird Canada](#)



*Raptor nest (possibly a Red-tailed Hawk nest) near Vernon in the B.C. Interior. Stands of tall trees in agricultural areas make good nest sites for open-country raptors such as Red-tailed and Swainson's hawks.*

Photo: Susan Latimer



*A group of Bald Eagles roosting in an agricultural area near the Coldstream River in the B.C. Interior. Large trees such as these Black Cottonwoods are commonly used for nesting, perching or roosting by raptors. Shrubs (foreground) provide excellent habitat for many species of raptor prey, including small birds and mammals.*

Photo: Susan Latimer

*Northern Goshawk nest located close to the trunk of a large Western Hemlock. Goshawks may nest on the periphery of rural areas provided large tracts of mature forest are nearby.*

Photo: Erica McLaren





## 8. Guidelines for Raptor Conservation

Following these guidelines will help to achieve the goal of maintaining raptors and their habitats in urban and rural environments. The guidelines in this document (summarized in **Table 1**, page 20) are based on ecological needs and behavioural traits of raptors and are generally applicable to urban and rural landscapes found in all regions of the Province. However, the selection of guidelines may differ according to local knowledge of the behaviour, life history, habitat use patterns and conservation needs in each region of the province. For more specific information on how to proceed with raptor protection measures in your area, landowners may wish to seek advice from professional biologists and local naturalist/conservation groups familiar with raptor ecology (see **Section 7**).

An extensive literature search indicated that while there is an abundance of recommended approaches to raptor management and conservation (particularly in regard to industrial forestry and agricultural practices), formal documents presenting a range of guidelines for raptors in urban and rural environments are lacking. In this regard, British Columbia is leading the way.

The guidelines for raptors presented here complement the guidelines presented in *Develop with Care 2012: Environmental Guidelines for Urban and Rural Land Development in British Columbia*. [Section 2](#) (targeted to local government planners) and [Section 3](#) (targeted to the development community) of that document contain higher-level planning information that is essential in order that the guidelines presented in this document be successful.

A summary of the species of raptors present and the timing of breeding in each region of British Columbia is presented in **Table 2**, page 24. Guidelines focus on, but are not limited to, species that breed in each region. Habitats that provide foraging and resting areas for over-wintering or migrating raptors are also important to maintaining raptor biodiversity of an area. It is important that protective measures account for species differences in breeding chronology. For example, the Bald Eagle and most owls nest very early in the spring, whereas others (such as Osprey and Cooper's Hawk) nest later in the season. Measures to reduce disturbance of nest sites should be implemented over the entire breeding season, not just when young are in the nest. During the early stages of courtship and nest initiation, for example, raptors are particularly sensitive to disturbance and may seek alternative nest sites or delay nesting, if harassed. Further information on the life histories and distribution of raptor species is provided in **Section 10**.



**Table 1. Summary of guidelines intended to help conserve raptors in urban and rural environments.**

SUMMARY OF GUIDELINES (see text for details)
<b>1. Retain existing habitats and features; minimize loss of natural vegetation</b> <ul style="list-style-type: none"><li>• Preserve all trees and snags used, or suspected of being used, by raptors as nesting sites.</li><li>• Where possible, retain groups of trees rather than isolated single trees to provide an interlocking canopy.</li><li>• Maximize retention of woodlots, shelterbelts, hedgerows, brushy thickets, and old field habitat.</li><li>• Preserve riparian areas including large trees (living and dead).</li><li>• Maintain natural shoreline vegetation adjacent to the ocean, estuaries, large lakes, and rivers.</li><li>• Retain undisturbed grasslands, old fields, pastures, and natural forest openings.</li></ul>
<b>2. Protect raptor nest sites</b> <ul style="list-style-type: none"><li>• Where a species at risk has a <a href="#">Recovery Plan</a> or if a qualified raptor professional provides advice, use their recommended minimum buffer distances. Otherwise, follow the guidelines in Table 6 (page 33).</li><li>• Maintain a minimum buffer of undisturbed vegetation around nest sites. An additional “quiet buffer” should be provided before and during breeding seasons (see Table 6).</li><li>• Protect both existing and potential nest sites, including veteran recruit trees and trees with natural cavities.</li><li>• Refer to <a href="#">Develop with Care</a> for additional information on buffers.</li></ul>
<b>3. Protect raptor roosting/perching sites and foraging areas</b> <ul style="list-style-type: none"><li>• Protect any trees, cliffs, or other specific sites that raptors regularly use for roosting, perching, or feeding.</li><li>• Protect good foraging sites including shorelines, wetlands, shrubby areas, old fields, hedgerows, and riparian areas.</li></ul>
<b>4. Avoid disturbance of sensitive habitats during and after development</b> <ul style="list-style-type: none"><li>• Locate new trails, buildings, and roads away from raptor nesting, roosting, and foraging areas.</li><li>• Keep machinery, people, and pets away from nesting, brood rearing, roosting, and foraging areas.</li></ul>
<b>5. Manage, restore, or enhance raptor habitat and features</b> <ul style="list-style-type: none"><li>• Use selective pruning of mature trees (outside of the breeding season, under the guidance of a raptor specialist) to make them more attractive to Bald Eagles, Red-tailed Hawks, and other raptors.</li><li>• Provide artificial perches such as poles and platforms if natural perches have been damaged or lost.</li><li>• Restore habitats where natural vegetation has been removed or altered, preferably by using native plants.</li></ul>



**SUMMARY OF GUIDELINES (see text for details)**

**6. Minimize the risk of accidental mortality**

- Protect raptors from electrocution from power lines and collisions with wires, windows, and sundeck enclosures.

**7. Avoid the use of pesticides and herbicides**

- Encourage nesting by raptors, which help to control populations of rodents and other pests.
- Use traps rather than poisons when controlling rodents or other pests to avoid secondary poisoning of raptors through ingestion of contaminated prey.
- Use integrated pest/weed management and avoid use of chemical pesticides.

**8. Educate the public about the importance of maintaining raptors in urban and rural environments**

- Use interpretative materials such as signs and brochures to make the public aware of the need to protect raptor habitats and to prevent disturbances to nesting and roosting sites.

*Areas with long grass are important for raptors that nest and roost on the ground. Human activities and pets such as dogs and cats in and near such areas can substantially reduce nesting success.*

Photo: ©LGL Limited.





More information on management of raptors can be found by investigating the weblinks in **Additional Information Sources**.

The provincial conservation status of different species of raptors and their ability to coexist with humans in urban and rural environments are summarized in **Table 3** (page 26). The compatibility rankings are estimates meant to show the wide ranges in tolerances of human developments among species. Generally, the least tolerant species are those with strict habitat requirements or that require large areas of undisturbed land. Birds that prefer old-growth or mature forests (e.g., Spotted Owl and Northern Goshawk) or remote mountainous areas (e.g., Golden Eagle) are good examples. Guidelines are most likely to be successful for those species with a high compatibility with human activity. Where possible, guidelines also try to address the requirements of less tolerant species or species that designated as being 'at risk'. However, such efforts should be planned with particular care and should not compound the problems faced by these species by attracting them to unsuitable habitats where their survival or productivity are compromised. Whenever protective measures are designed for species that are officially listed to be at risk, additional advice and information should be obtained from a professional biologist with expertise in that species.

The guidelines and other parts of this document strive to address the following principles of raptor conservation in urban and rural areas.

1. *Where possible, retain existing, natural habitats suitable for raptors.*

The best way to conserve raptors in urban and rural environments during land development is to ensure that an adequate amount of suitable habitat is left undisturbed.

*In agricultural areas of B.C., barns, sheds, and other buildings with permanent openings provide potential roosting and nesting habitat for Barn Owls.*

Photo: ©LGL Limited.





2. *Strive to retain, restore, or enhance key habitat features for raptors, so that no net loss of habitat occurs.*

These features consist of nesting, roosting, foraging, and other sites that are essential for raptors. Provincial laws provide legal protection for the active nests of all species of raptors; however, except for select species identified in the *Wildlife Act* (see **Section 6**) or for species listed under the *Species at Risk Act* (SARA), most unoccupied nests are not protected when not in use or outside the nesting season. Perches and roosts are not usually afforded legal protection on private land. In cases where known habitat features cannot be retained, **mitigation** is recommended through habitat restoration or enhancement. The best option is always to retain existing natural features.

The key to raptor conservation is the protection of existing habitat.

It is better to conserve habitats in the first place than to have to restore them later.

3. *Use caution when attempting to restore or enhance raptor habitats.*

Some methods for habitat enhancement are relatively simple, such as providing artificial nest sites (for species known to use them). Others are more complex and involve restoring key habitat features required to fulfill the needs of raptors. Caution must be used to prevent attracting raptors to otherwise unsuitable areas where their survival and productivity may be reduced, or where they may cause conservation concerns for existing wildlife.

Habitats are important even if they are not used for breeding. For example, the Fraser lowlands provide significantly important wintering grounds for numerous raptor species and can be affected by land practices such as greenhouses.

4. *Avoid disturbing raptors at nesting, roosting, and feeding sites.*

In some cases, it is possible to establish undisturbed **buffers** around active raptor nests, known roosts, and feeding sites such as salmon-spawning areas. Specific minimum sizes of buffers are suggested in this document (see **Table 6**), but larger buffers may be required depending on the conditions at each site. Caution should be taken to avoid disturbance to raptors when installing webcams at raptor nests (see **Appendix B**).

5. *Be able to demonstrate that urban and rural land developments comply with Provincial laws (see **Section 6** and **Appendix A**).*

In British Columbia, the active nests of all raptors are legally protected; inactive nests of the Bald Eagle, Golden Eagle, Peregrine Falcon, Gyrfalcon, Osprey, and Burrowing Owl are also similarly protected. The destruction of any aforementioned nest (or nest tree or nest site) requires prior authorization from the provincial government. Authorization must be applied for well in advance and may be rejected if sufficient justification is not given. All developments must exercise due diligence in attempting to identify nests and in avoiding or mitigating impacts on them.

6. *Try to ensure that decisions regarding urban and rural land developments are credible and are based on adequate information on any raptor habitats that might be affected.*

Shared stewardship of wildlife implies that expert advice and information can be sought from a variety of sources, including naturalist groups, local wildlife experts, and regional wildlife biologists. Landowners may also wish to seek advice from professional biologists familiar with raptor ecology.



**Table 2. Occurrence and timing of nesting by raptors in each region of the province.**

Data from Campbell et al. (1990) updated in 2012 with data from BC Breeding Bird Atlas and eBird Canada; dates will vary within the range indicated according to year and location. Shaded box indicates that breeding occurs in Region.

Species – breeding occurs or probably occurs within the Region but does not necessarily occur everywhere within the Region.	Breeding Occurrence by Region(s) (see map page 10)								Breeding Chronology*	
	West Coast	South Coast	Thompson/ Okanagan	Kootenay/ Boundary	Cariboo	Omineca	Northeast	Skeena	Eggs Present	Young present at nest
Turkey Vulture									April 10-June 21	May 10-Aug 31
Osprey									April 21-July 5	May 25-Sept 5
Bald Eagle									Feb 5- June 25	April 1-Aug 31
Golden Eagle									April 1- June 10	May 1-Aug 31
Northern Harrier									Apr 15-June 30	May 10-Aug 7
Sharp-shinned Hawk									May 30- June 5	July 1- Aug 15
Cooper's Hawk									May 1-July 21	June 5-Aug 31
Northern Goshawk									April 7-June 10	May 20- Aug 21
Swainson's Hawk		??				??			May 2-June 30	June 5-Aug 15
Red-tailed Hawk									Feb 26-June 30	April 10-Aug 10
Ferruginous Hawk									May 1-31	July 1-31
American Kestrel									April 5 – July 20	May 5- Aug 27
Merlin									April 17 – July 4	May 20 – Aug 12
Peregrine Falcon									Mar 30 – June 30	May 2- July 20
Gyr Falcon									April 1 – May 30	May 2 – July 18
Prairie Falcon									Mar 30 – April 30	May 21-Aug 4
? Historic breeding record, no recent records										
?? Possible breeding record or breeding recorded immediately adjacent to region boundary										
* For land development, follow the guidelines in <i>Develop with Care</i> . Where the <i>Develop with Care</i> guidelines do not apply, avoid disturbance activities near the nest at least one month prior to 'eggs present date' and until after young have left the nest area.										





Species – breeding occurs or probably occurs within the Region but does not necessarily occur everywhere within the Region.	Breeding Occurrence by Region(s) (see map page 10)								Breeding Chronology*	
	West Coast	South Coast	Thompson/ Okanagan	Kootenay/ Boundary	Cariboo	Omineca	Northeast	Skeena	Eggs Present	Young present at nest
Barn Owl									Year round	Year round
Flammulated Owl		??							April 25-July 25	May 15 – Aug 17
Western Screech-Owl									March 17-June 1	April 20-Aug 25
Great Horned Owl									Feb 10 – May 18	March 20 – Sept 6
Northern Hawk Owl									April 21-May 31	May 27 – Aug 8
Northern Pygmy-Owl									April 15 – June 15	June 9 – Aug 27
Burrowing Owl		?		??					Mar 25 – May 20	May 2 – Sept 30
Spotted Owl									Mar 18 – June 26	April 25 – July 27
Barred Owl									Mar 21 – April 7	April 20 – Aug 14
Great Gray Owl									Mar 27 – May 15	April 30 – Aug 12
Long-eared Owl									March 11- June 12	April 11-Aug 1
Short-eared Owl	??							??	March 28 – July 10	April 12 – Sept 15
Boreal Owl				??					April 1 – May 1	May 1 – July 15
Northern Saw-whet Owl									March 1 – May 31	April 4 – Aug 14
<p>? Historic breeding record, no recent records</p> <p>?? Possible breeding record or breeding recorded immediately adjacent to region boundary</p> <p>* For land development, follow the guidelines in <i>Develop with Care</i>. Where the <i>Develop with Care</i> guidelines do not apply, avoid disturbance activities near the nest at least one month prior to 'eggs present date' and until after young have left the nest area.</p>										



**Table 3. Provincial conservation status**

See **Section 10** for species-specific information on habitat requirements and compatibility with human landscapes.

Species	At-risk*	Ability to co-exist**	Remarks
Turkey Vulture	No	Mod	Forages in urban and rural settings; requires remote nesting and roosting sites
Osprey	No	High	Readily nests on human-made structures; tolerant of human activity
Bald Eagle	No	Mod - High	Requires large nest trees near coast or large body of water; tolerant of human activity
Golden Eagle	No	Low	Usually found in remote mountainous areas
Northern Harrier	No	Mod	Forages in old-fields and marshes in urban and rural areas; ground nests susceptible to disturbance and predation from domestic pets and humans
Sharp-shinned Hawk	No	Mod	Requires secure forest cover for nesting; tolerant of human activity
Cooper's Hawk	No	Mod - High	Can nest in close proximity to human developments; prefers an area of interlocking tree canopy for rearing young; Greater Victoria contains one of the highest nesting densities of this species in North America
Northern Goshawk - <i>laingi</i>	Yes	Low	Requires large tracts of forest for nesting and foraging; may use rural areas, especially during winter. <i>A. g. laingi</i> breeds on Haida Gwaii and Vancouver Island and mainland coast. <i>A. g. atricapillus</i> breeds in the interior and may winter along the coast
Northern Goshawk - <i>atricapillus</i>	No	Low	
Broad-winged Hawk	Yes	Low-Mod	Inconspicuous and secretive; occasionally seen during migration in B.C.
Swainson's Hawk	Yes	Mod - High	Can nest and forage in close proximity to human developments and farmland; requires undisturbed grasslands with adequate food supply
Red-tailed Hawk	No	High	Very tolerant of human activity; nests and forages in urban and rural settings
Ferruginous Hawk	No status	Low - Mod	Historic, uncommon breeder in Southern Interior; prefers undisturbed grasslands and desert-shrub; little is known about its habitat requirements in B.C.
Rough-legged Hawk	Yes	Mod	Tolerant of human activity; commonly winters on farmland in Lower Mainland and Southern Interior; does not breed in B.C.
American Kestrel	No	Mod -High	Forages and nests in urban and rural settings; tolerant of human activity
Merlin	No	Mod -High	Forages and nests in close proximity to human developments, provided songbird prey is available. Requires secure tree cover for nesting

\* At-risk: Colours in the "at-risk" column correspond to Red-, Blue-, or Yellow-listing of raptors.

\*\* Ability to Co-exist: This assessment is based on the species' tolerance of human activities near the nest site, foraging habitat and wintering habitat. The column colours reflect the level of tolerance, with green colours signifying greater compatibility and red colours signifying low tolerance of human disturbance. Note that this rating affects the recommended nesting buffer distances (see Table 6, which bases tolerance only on proximity to nesting sites).



Species	At-risk*	Ability to co-exist**	Remarks
Peregrine Falcon - <i>anatum</i>	Yes	Mod	Some birds can nest in close proximity to human developments including tall buildings and bridges; cliff nesting birds may be susceptible to human disturbance; prefers to hunt over large wetlands, estuaries and along undisturbed coastlines
Peregrine Falcon - <i>pealei</i>	Yes	Mod	<i>F. p. pealei</i> breeds on and around Haida Gwaii and Vancouver Island; <i>F. p. anatum</i> breeds in the interior and the Lower Mainland. The Gulf Islands is a hybrid zone of the two subspecies
Gyr Falcon	Yes	Low - Mod	Some birds winter in open fields and marshes fairly close to human developments; nest in remote mountainous regions of northwestern B.C.
Prairie Falcon	Yes	Mod	May forage close to human developments, but requires remote cliffs for nesting
Barn Owl	Yes	Mod - High	Fairly adaptable; will nest and roost in old farm buildings (currently being lost to development) and artificial nest structures; requires old-fields and abundant supply of voles for foraging
Flammulated Owl	Yes	Mod	Requires relatively large dead or dying trees for nesting; mainly dependent on woodpeckers to create cavities; susceptible to forest clearing and danger tree removal activities
Western Screech-Owl - <i>macfarlanei</i>	Yes	Mod	Populations, particularly interior populations of <i>O. k. macfarlanei</i> in the Okanagan Valley, are very susceptible to land use changes and loss of woodlands and shrubby areas in valley bottoms; requires relatively large dead or dying trees for nesting; mainly dependent on woodpeckers to create cavities; susceptible to forest clearing activities
Western Screech-Owl - <i>kennicotti</i>	Yes	Mod	expansion of Barred Owls into human-altered landscapes appears to have negative consequences for B.C. populations
Great Horned Owl	No	High	Very tolerant of human activity; nests and forages in urban and rural settings
Snowy Owl	Yes	Mod	Some birds winter in open fields and marshes relatively close to human developments. Snowy Owls do not breed in B.C.
Northern Hawk Owl	No	Mod	Requires large dead or dying trees for nesting; dependent on woodpeckers to create cavities; susceptible to forest clearing activities
Northern Pygmy-Owl	No	Mod	Requires large dead or dying trees for nesting; mainly dependent on woodpeckers to create cavities; susceptible to forest clearing activities
Northern Pygmy-Owl <i>swarthi</i>	Yes	Mod	Only the subspecies <i>G.g. swarthi</i> on Vancouver island is At Risk/Blue-listed. Throughout the rest of their range in B.C. pygmy-owls are not at risk.
Burrowing Owl	Yes	Low	Can nest close to human developments but nesting burrows are susceptible to predation and disturbance; requires undisturbed grassland for foraging
Spotted Owl	Yes	Low	Requires large tracts of old-growth forest for foraging and nesting

\* At-risk: Colours in the "at-risk" column correspond to Red-, Blue-, or Yellow-listing of raptors.

\*\* Ability to Co-exist: This assessment is based on the species' tolerance of human activities near the nest site, foraging habitat and wintering habitat. The column colours reflect the level of tolerance, with green colours signifying greater compatibility and red colours signifying low tolerance of human disturbance. Note that this rating affects the recommended nesting buffer distances (see Table 6, which bases tolerance only on proximity to nesting sites).

Species	At-risk*	Ability to co-exist**	Remarks
Barred Owl	No	High	Expanding its range in B.C.; implicated in the decline of other owl species including the Western Screech-Owl and Spotted Owl
Great Gray Owl	No	Mod	Tolerant of human activity but requires large tracts of forest habitat
Long-eared Owl	No	Mod - High	Can nest in close proximity to human developments
Short-eared Owl	Yes	Mod	May forage in marshes and old-fields close to human developments; ground nests are very susceptible to predation by domestic pets and disturbance by humans
Boreal Owl	No	Mod	Normally found at higher elevations away from human developments; requires large dead or dying trees for nesting; mainly dependent on woodpeckers to create cavities; susceptible to forest clearing activities
Northern Saw-whet Owl	No	Mod - High	Requires relatively large dead or dying trees for nesting; mainly dependent on woodpeckers to create cavities; susceptible to forest clearing activities. Only the subspecies <i>A.a. brooksi</i> on Haida Gwaii is At Risk/Blue-listed. Throughout the rest of their range in B.C., Saw-whet Owls are not at risk.
Northern Saw-whet Owl <i>brooksi</i>	Yes	Mod - High	

\* At-risk: Colours in the “at-risk” column correspond to Red-, Blue-, or Yellow-listing of raptors.

\*\* Ability to Co-exist: This assessment is based on the species’ tolerance of human activities near the nest site, foraging habitat and wintering habitat. The column colours reflect the level of tolerance, with green colours signifying greater compatibility and red colours signifying low tolerance of human disturbance. Note that this rating affects the recommended nesting buffer distances (see Table 6, which bases tolerance only on proximity to nesting sites).



*A typical nest site of a Peregrine Falcon on a cliff ledge with overhanging cover. Some Peregrines that have habituated to human activity can nest in urban and rural areas. Since adults and young may flush from the nest if humans approach too closely, a disturbance-free buffer zone needs to be established around the nest.*

Photo: Don Doyle



### 8.1. Retain Existing Habitats and Features; Minimize Loss of Natural Vegetation

One of the most effective management practices to benefit wildlife is to retain existing habitats and habitat features.<sup>6</sup> Raptors and their habitats are no exception. It is much more practical and cost-effective to conserve habitats in the first place than to restore or rehabilitate them later.

As documented in the species accounts (**Section 10**), important raptor habitats and key features in urban and rural areas of British Columbia include nesting, perching and roosting sites, and foraging areas (see **Table 4**). Wherever possible, these habitat features should be retained using the measures described below. The size of the habitat area should be as large as possible. Species that would benefit from the conservation of these features in the urban and rural landscapes are listed in **Table 5** (page 31).

Retain natural forest and understorey vegetation wherever possible; this provides habitat for prey animals and nesting cover for raptors.

**Table 4. Important features of raptor habitat and the values they confer.**

CRITICAL HABITAT/FEATURE TO RETAIN	KEY VALUES FOR RAPTORS
Large, wind firm trees (living and dead) and veteran recruit trees, particularly within 500 m of large water bodies	Nesting and roosting
Dead and dying trees suitable for use by woodpeckers, who in turn create nest cavities for small owls	Nesting and roosting
Stands of coniferous or deciduous forest cover, preferably with an inter-locking canopy	Nesting, perching (hunting/resting); rearing of young, roosting
Woodlots, shelterbelts, shrubby areas, hedgerows, and natural forest openings	Nesting, perching (hunting/resting), prey habitat
Riparian and valley bottom areas with trees and dense thickets	Nesting, perching (hunting/resting), prey habitat
Undisturbed grasslands and scrubland	Nesting, hunting, prey habitat
Agricultural “old-fields” and pastures	Nesting, hunting, prey habitat
Natural forested and open (e.g., riparian) habitats adjacent to fish bearing water bodies, including ocean shorelines, estuaries, lakes, reservoirs, and rivers	Nesting, perching (hunting/resting), prey habitat
Cliffs, steep terrain and rocky areas	Nesting, perching, hunting
Marshes, swamps, wet meadows and other wetlands	Nesting, hunting, prey habitat
Barns and buildings with permanent openings in agricultural areas	Nesting and roosting

<sup>6</sup> Lane 1996





The following measures are recommended to protect existing habitat features.

- ☑ Preserve as many large trees and snags as possible (living and dead), which can be used by raptors for nesting and perching. Trees adjacent to water are particularly valuable; dead trees are very important for attracting woodpeckers that create nest cavities for small owls and other wildlife; and large trees with broken tops are also used for nesting.
- ☑ Trees that provide important wildlife habitat should be identified as such in order to protect them from harm or destruction. Signs such as “Wildlife Tree” signs are an effective means of identifying these. The signs also educate the public about the important wildlife habitats and conservation issues. Further information on wildlife trees and wildlife tree signs is available from the Province’s [wildlife trees website](#), brochure on [hanging wildlife tree signs](#), and the [Wildlife Tree Committee of British Columbia](#).
- ☑ Because older, veteran trees are subject to blow-down and are sometimes felled due to safety concerns, it is important to maintain several mature trees that will become the veterans of tomorrow.
- ☑ Where possible, retain groups of trees rather than isolated single trees to provide an inter-locking canopy; this approach maximizes secure cover for nesting birds.
- ☑ Maximize retention of woodlots, shelterbelts, hedgerows, and brushy thickets; keep these areas as natural as possible by preserving native trees and understorey plants; these areas provide habitat for prey species and are attractive nesting, hunting and roosting areas for many raptors.
- ☑ Retain wetlands and keep riparian habitats as natural as possible; riparian habitats are productive for a wide variety of wildlife, and raptors use these areas for hunting and potentially for nesting. Fish-bearing water bodies are particularly attractive to eagles and Ospreys; riparian habitats in arid regions of the interior of British Columbia are critical to the survival of many raptor species in these regions.
- ☑ Retain undisturbed grasslands, old fields, pastures and natural forest openings; such areas add habitat diversity and attract raptors that prefer more open habitats. Try to keep the openings undisturbed so that secure cover is available to prey species and as a potential nesting area for ground nesting raptors, such as the Short-eared Owl and Northern Harrier. Avoid mowing of fields during the nesting season.
- ☑ Maintain natural shoreline vegetation adjacent to the ocean, estuaries, large lakes, and rivers; such areas are used by eagles and Ospreys for feeding and nesting, and are attractive to migrating raptors such as Peregrine Falcons.
- ☑ Where feasible, retain old farm buildings such as barns and sheds that are attractive to Barn Owls.





**Table 5. Raptor species likely to benefit from the protection of key habitat features in British Columbia.**

*Shaded cells indicate a benefit.*

Species	Large wind firm trees near water	Dead "woodpecker" trees	Inter-locking forest canopy	Wood-lots, hedgerows, natural forest openings	Riparian areas; valley bottoms	Undisturbed grasslands and scrublands	Old fields	Fish-bearing water bodies	Cliffs	Wetlands	Old farm buildings
Turkey Vulture											
Osprey											
Bald Eagle											
Golden Eagle											
Northern Harrier											
Sharp-shinned Hawk											
Cooper's Hawk											
Northern Goshawk											
Broad-winged Hawk											
Swainson's Hawk											
Red-tailed Hawk											
Ferruginous Hawk											
Rough-legged Hawk											
American Kestrel											
Merlin											
Peregrine Falcon											
Gyrfalcon											
Prairie Falcon											
Barn Owl											
Flammulated Owl											
Western Screech-Owl											
Great Horned Owl											
Snowy Owl											
Northern Hawk Owl											
Northern Pygmy-Owl											
Burrowing Owl											
Spotted Owl											
Barred Owl											
Great Gray Owl											
Long-eared Owl											
Short-eared Owl											
Boreal Owl											
Northern Saw-whet Owl											



## 8.2 Protect raptor nest sites

Nests of Bald Eagles and Ospreys are conspicuous and receive repeated use over many years. Databases of nest locations for these species are available (see **Section 7**). Nest sites of some other raptors are less obvious (e.g., buildings used by Barn Owls, cliff ledges used by Turkey Vultures and Peregrine Falcons, tree nests of smaller raptors such as Sharp-shinned Hawks, and tree cavities used by small owls or Kestrels). Whenever raptor nest sites, actual or potential, are present within an area slated for development, it is always preferable to seek ways of avoiding the loss of these sites and associated habitat.

Nest sites of other raptors may also be known, but such nests are not necessarily used by the same birds in consecutive years. A good example is the Cooper's Hawk, which often uses an alternate nest in the general vicinity of the nest used in the previous year. Many other raptor species use alternate nest sites or use different nest sites each year. Protecting stands of suitable nest trees is more important than protecting an individual nest tree for the long-term interests of such species.

It is important that nesting raptors be protected from unnecessary disturbance. The literature contains many examples of recommended buffer sizes to provide such protection (e.g., see summary in Richardson and Miller 1997). A single buffer size for all species and situations is not feasible. Some raptor species are more tolerant of human disturbance when nesting than others. Also, raptors habituated to the urban environment tend to be more tolerant of disturbance when nesting than raptors living in rural and undeveloped environments. The buffers suggested in this document (see measures below) are minimums, and additional protection may be required under certain circumstances, depending on the nature of disturbance and other factors. For example, if the bird consistently flushes (flies away from the nest) when using the minimum buffer, an increased buffer zone should be used. Flexibility in defining buffer distances around active raptor nests has been recommended by others (e.g., USDA 1997). Examples of how protective buffers around raptor nest sites can be implemented on private, municipal, and regional lands using the [Local Government Act](#) and [Community Charter](#) in B.C. are presented in Henigman (2004).

The following measures are recommended to protect raptor nest sites:

- ☑ For tree-nesting species, maintain a minimum buffer of undisturbed natural vegetation from the nest site as shown in Table 6. This buffer area not only provides protection for the nest but also improves the safety of residents should the nest tree or limbs fall. Any activities within the buffer should be strongly discouraged.
- ☑ Protect cliff-nesting raptors (e.g., Peregrine Falcons, Prairie Falcons, and Golden Eagles) by locating buildings and industrial activities (such as rock quarrying) well away from the cliff edge. Maintain a protective buffer consisting of undisturbed natural vegetation, as shown in Table 6. Recreational activities such as rock climbing and hang gliding should not be allowed in the month prior to and during the nesting period.

Maintain undisturbed natural vegetation within a minimum distance of one and half tree lengths from the nest site for all urban nesting raptors

For some raptors, individual nest sites are critical (e.g., Bald Eagle, Osprey, Red-tailed Hawk) .

For others, forest stands of potential nest trees are more important than individual sites (e.g., Cooper's Hawk, Sharp-shinned Hawk, Merlin, cavity-nesting owls) add images



**Table 6: Recommended minimum buffers for nesting raptors**

Ability to co-exist*	Undeveloped	Rural	Urban	Breeding season 'quiet' buffer (additional)
"High" and "moderate-high"	200 m	100 m	1.5 tree lengths or 50 m from cliff	100 m
"Moderate"	500 m	200 m	1.5 tree lengths or 50 m from cliff	100 m
"Low-moderate" and "low"	500m	As advised by Professional Biologist**	As advised by Professional Biologist**	As advised by Professional Biologist**

'Undeveloped' applies to large tracts of previously undeveloped forest or grasslands that are being developed into lots of 5 ha or less. In undeveloped areas, most birds have likely had less contact with humans and will be less tolerant of human presence. 'Rural' applies to lots sizes of 1–5 ha that are being further subdivided or developed. 'Urban' applies to lots that are 1 ha or less and are being further subdivided, developed, or modified in some way. In urban areas, buffer widths are smaller because some birds will have developed greater tolerance to human activity, and the high demand for land and/or previous developments may preclude larger buffers.

'Breeding season quiet buffer' is an additional buffer distance that should be used where land contouring, construction, or any unusual or sudden loud activities (e.g., tree felling, chain saws, concrete cutters, large trucks, whistles, fireworks, or banging devices) is to take place during the active breeding season. During their breeding season, especially during early courtship and egg-laying periods, birds are very sensitive to noise disturbances and may desert their nests and young. This distance is ADDED to the prescribed buffer. For more information about breeding seasons, see the species accounts in Section 10.

Where a Species at Risk has a [Recovery Plan](#), that report's recommended buffers and timing take precedence to this table. Always check for the latest information when dealing with species at risk.

\*"Ability to Co-exist" refers to the species' tolerance to activity near the nest site. This may differ from the tolerance rating shown in Table 3 (page 26) which also includes disturbances near feeding and winter habitats. Species listed below are those known to nest in proximity to rural or urban habitats in B.C. Should nests of other species be found where they may conflict with potential development activities, the advice of a Professional Biologist should be sought before proceeding with activities that may disturb the nest site.

- Species with "high" tolerance: Osprey, Red-tailed Hawk, Great Horned Owl, and Barred Owl
- Species with "moderate-high" tolerance: Bald Eagle, Cooper's Hawk, Swainson's Hawk, American Kestrel, Merlin, Barn Owl, and Northern Saw-whet Owl
- Species with "moderate" tolerance: Turkey Vulture, Sharp-shinned Hawk, Peregrine Falcon, Northern Harrier, Flammulated Owl, Western Screech-Owl, Short-eared Owl, Long-eared Owl, and Northern Pygmy Owl
- Species with "low-moderate" tolerance: Burrowing Owl, Red-legged Hawk, and Prairie Falcon
- Species with "low" tolerance: Golden Eagle, Northern Goshawk, and Spotted Owl

\*\*Where professional advice is recommended, ensure that the individual has expertise with that species to determine an appropriate buffer.



For a discussion of buffers and buffer distances see [Develop with Care, Section 4](#) (including Table 4.1).

- ☑ Maintain an additional buffer, measured from the outer edge of the permanent buffer, that is free of human disturbance during the courtship/nesting season (see **Table 6 Column 5 Breeding Season 'Quiet' Buffer** and **Table 2: Occurrence and timing of nesting by raptors in each region of the province**, page 24). Local governments have the power to use Development Permit bylaws to reduce disturbance around identified nest trees.
- ☑ Reduce year-round disturbance around the nest site by locating new trails, buildings, and roads away from raptor nesting habitat and by limiting access to existing trails and facilities.

### 8.3 Protect raptor roosting/perching sites and foraging areas

Protecting roosting and perching sites and foraging areas is an excellent way to help maintain raptor populations in urban and rural environments. Roosts may be used year-round by one or more individuals, or by larger groups (e.g., Turkey Vultures and Bald Eagles). Suitable perching sites and foraging areas allow raptors to obtain adequate food for reproduction and survival.

The following measures are recommended to protect these sites.

- ☑ Preserve any trees, cliffs, or other specific sites that raptors regularly use for roosting, perching or feeding; good foraging sites include shorelines, estuaries, wetlands, shrubby areas, old fields, hedgerows, and riparian areas.
- ☑ Avoid placing new trails, roads, or buildings in the immediate vicinity of above sites.

*Raptors such as the Spotted Owl (shown here), Great Horned Owl and Barred Owl sometimes use the bowl-shaped depressions in the broken tops of large snags for nesting.*

Photo: ©Jared Hobbs





*Northern Saw-whet Owl nesting in a cavity in a Ponderosa Pine tree.*

Photo ©LGL Limited

#### **8.4. Avoid disturbance of sensitive habitats during and after development**

Without careful planning, disturbance from construction, including work crews and heavy equipment, can be potentially harmful to raptors. These activities should be scheduled to avoid the breeding season, and care is required to prevent physical damage to the vegetation and key habitat features. Blasting is of particular concern, especially during courtship and egg-laying periods. If blasting must occur at this time, a minimum 1,000 m (1 km) buffer from the nest site should be maintained.

Careful planning is also required to ensure that activities after the construction phase are not impacting breeding, roosting, or foraging areas. Structures, facilities, and roads should be located away from raptor habitats. In addition, public access to sensitive areas should be restricted using fencing, re-routing of trails, and/or posting of signs.

The following measures are recommended to minimize disturbance.

- ☑ Avoid loud noises and human activity adjacent to nest sites during the entire breeding period; the early courtship, nest initiation and incubation periods are the most sensitive times (see **Table 2** for details of timing of nesting in different regions of British Columbia).
- ☑ Minimize disturbance to natural vegetation and avoid creating access to raptor habitats.
- ☑ Keep machinery, people, and pets away from important habitats including nesting, brood rearing, roosting, and foraging areas.
- ☑ For large properties, locate recreational facilities, trails, and access points away from sensitive habitats such as riparian areas and discourage activities on or near nesting cliffs.

Developments near protected areas pose a unique problem. While the developments themselves may not harm raptor habitat, the amount of human and pet use of the protected area can increase. Dogs and cats can disturb raptors and can kill or injure them, their young, and their prey. Repeated use of an area for hiking, bicycling, horseback riding, and motorcycling all have considerable potential to reduce the habitat suitability for raptors. It is important that people understand how their presence can harm wildlife and their habitats. Signage and fencing can be effective means of directing activities to appropriate areas.



## 8.5. Manage, restore or enhance raptor habitat and features

In highly modified landscapes such as urban areas, restoration and enhancement measures may be needed to maintain viable populations of raptors. Habitat restoration includes re-establishing habitat features and ecological conditions that raptors need. This restoration can be carried out at different spatial scales and can range from re-creating habitat connectivity at a broad scale to landscaping practices and individual actions by residents in their backyards. To be successful, both large- and small-scale restoration projects require careful planning and knowledge of the requirements of the target organisms. The replacement of natural habitat features with artificial structures (such as nest boxes) should be considered a temporary solution and will not be effective for all species. The goal of restoration and enhancement is to re-establish natural habitat features.

The following restoration and enhancement measures for raptors are recommended:

- ☑ Replace raptor nest sites that are damaged or lost; this may include nest boxes for owls (see specifications for each species, e.g., [Barn Owl Nestbox Construction Details](#); [Nest Box & Bird Feeder Plans](#); the [Owl Pages](#); and [Bird Studies Canada](#)), nesting platforms for Osprey (see [plans for building osprey nest platforms](#), [Forest Management Guide for the Protection of Osprey Nests](#), Ewins 1994), or pruning mature trees (with professional guidance) to make them more attractive to Bald Eagles, Red-tailed Hawks and other raptors (see [bald eagle nesting habitat enhancement](#)). If large trees need to be felled for safety reasons, consider providing artificial nest structures; remember that natural nest trees are more effective over the long term. Artificial structures should be considered a temporary solution until suitable nesting habitat is restored and is not be appropriate for many raptor species.
- ☑ Provide artificial perches such as poles and platforms if natural perches have been damaged or lost (see [Nesting Platform for Red-tailed Hawks & Great Horned Owls](#)).
- ☑ Restore habitats where natural vegetation has been removed or altered. Use native species of trees, shrubs, and grasses. Control invasive plants. Creation of shrub thickets and hedgerows provides excellent foraging habitat for raptors.
- ☑ Maintain an area of uncut lawn or pasture near forest edges to increase prey abundance.
- ☑ Manage open fields to provide sufficient escape cover for prey (small native mammals) populations and improve access to prey by raptors; prevent encroachment by shrubs and trees to old field habitats (note that mowing should take place outside the nesting season of any ground-nesting species that might be in the area); where possible, retain existing “old-field” habitats in their natural state.



*Raptor perch created  
from topped tree*

Photo:©LGL Limited

In B.C., captive-bred Burrowing Owls produce young which are being successfully released into artificial nest burrows that are created in in appropriate grassland habitat.

Artificial structures are not a long-term substitute for natural habitat features





- ☑ Reduce potential impacts of grazing animals (e.g., on hobby farms in rural areas) on prey populations and ground-nesting raptors, for example by fencing off the nest and buffer during breeding season.
- ☑ Create snags for perching, roosting, and nesting. Snags can be created by retaining the lower portion of dead or dying trees. Artificial perching poles can be strategically placed within the habitat (see [Artificial Perches for Raptors](#))

**Roosts** are secure sites used for resting

**Perching** sites are used to survey an area

Information on breeding distribution in British Columbia, suitable habitats, and nest sites can be used to tailor nesting replacements to specific situations (see **Section 10** for species accounts).

In the case where loss of important raptor habitat features is inevitable, replacement structures should be created or erected in suitable nearby habitats prior to the onset of nesting activity. Always check with the Provincial Government to find out if permits are needed before undertaking any activities that destroy key habitat features for raptors. Replacement of lost structures can compensate for the losses to some extent and is in accordance with the principle of “no net loss of habitat”. However, replacement structures should never be used as an excuse to destroy natural habitat features, which usually provide higher-quality, long-term habitat for raptors.

All tree felling, vegetation clearing, or building removal should occur from mid-September to January to minimize the risk of destroying active raptor nests. If clearing or demolition must occur outside this timing window, a thorough nest search should be conducted.



*Nests of Ospreys can be removed from one site, placed onto a platform, then secured atop a nearby structure such as a pole or tree. Such operations require trained professionals.*





## 8.6. Minimize the risk of accidental mortality

Electrocution poses a serious threat to raptor safety in areas where power-lines are used as perches or nesting platforms. Large raptors can be electrocuted by power transmission lines if they make simultaneous contact with two conductors or contact one conductor while perched on a structure that is earthed. Wires also pose collision hazards, particularly for young birds learning to fly or where raptors are concentrated such as at salmon-spawning streams or migration/staging areas. Further information on raptors and power-lines can be found at [Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006](#) and [Avian Protection Plan Guidelines](#).

The following measures are recommended to minimize the risk of accidental mortality.

- ☑ In high-risk areas, retrofit power lines so that the risk of electrocution of raptors is minimized (see [Power Line Collisions and Electrocutions](#)); in new developments, locate transmission lines underground where possible. For Osprey nests on top of power poles, relocate the nest to an alternate platform closeby, to prevent the electrocution of the birds and brown-outs for people.<sup>7</sup>
- ☑ In areas where raptors are concentrated (such as Bald Eagle roosting sites), minimize the risk of collisions with power transmission lines by using large floats and other markers to make wires more visible.
- ☑ Minimize the risk of mortality of raptors due to collisions with windows and clear panel railings on sun decks. Use non-reflective substitutes, awnings, screens, tinted films or apply decals generously onto windows or clear panels; in new construction, use non-transparent materials for sun decks.

*Ospreys commonly nest atop electrical poles and towers. Nests in such locations pose hazards to the birds and often result in costly power outages.*

Photo: ©LGL Limited



<sup>7</sup>

M. Chutter, pers.comm.



*Construction projects can disturb raptors occupying adjacent habitats (in background).*

Photo: ©LGL Limited.

### **8.7. Avoid the use of pesticides and herbicides**

As top predators, raptors are particularly susceptible to a variety of environmental contaminants as poisons ingested by their prey accumulate in the raptors' bodies. The following measures are recommended to minimize risk of mortality or reduced productivity due to pesticides and herbicides.

- ☑ Encourage raptor nesting, as the raptors will help to control populations of rodents and other pest species.
- ☑ Use integrated pest/weed management and avoid use of chemical pesticides, which can be harmful to raptors and other wildlife.
- ☑ Use traps rather than poisons when controlling rodents or other pests to avoid secondary poisoning of raptors through ingestion of contaminated prey.

### **8.8. Educate the public about the importance of maintaining raptors in urban and rural environments**

- ☑ Use interpretative materials such as signs and brochures to make the public aware of the need to protect raptor habitats and to prevent disturbances to nesting and roosting sites.
- ☑ Encourage volunteers and local residents to collect data and make observations when monitoring raptor conservation projects (see **Section 9**).
- ☑ Landowners should be informed about raptors using their property and should be encouraged to observe and record their activities. Education programs can lead to stewardship agreements, land covenants, and habitat management initiatives. Educating the public about the value of raptors would make it easier for local governments to get community support for the inclusion of provisions for raptor conservation in Official Community Plans.



## 9. Monitoring and Reporting

### 9.1. Why is monitoring necessary?

Encourage volunteers and local residents to collect data and make observations when conducting effectiveness monitoring of raptor conservation projects

It is important to find out whether particular measures taken to protect raptors are effective. Monitoring consists of follow-up activities undertaken to address this issue. Monitoring is very important for several reasons. First, time and resources may be wasted on measures that are ineffective or even counter-productive; monitoring can detect problems at an early stage and prevent the waste of resources. Second, refinements of mitigation measures may need to be adjusted for specific sites; monitoring will help to identify problem areas and direct these adjustments. This process is known as adaptive management. Third, much can be learned from each individual project; this information will help in the design of other similar projects. Monitoring programs offer excellent opportunities for involving residents and stewardship groups in conservation activities, thus promoting awareness and stewardship of raptors and their habitats within urban and rural areas.

### 9.2. What is involved in setting up a monitoring program?

A plan should be prepared on how monitoring is to be accomplished for each project. The plan should address the following questions: What are the specific issues that need to be addressed, and what does the monitoring program hope to achieve? What information will be collected and how frequently? Who will carry out the monitoring activities? How will the results be incorporated into mitigation or management practices?

Monitoring of the effectiveness of guidelines can focus either on the condition of the habitat or on the raptors themselves. Examples of monitoring questions focusing on habitat condition include the following:

- Were potential nesting trees, hedgerows, shrub thickets and other raptor habitat features retained during development, as planned?
- Do these features continue to remain in their original condition immediately after development and over the long term?
- Has the natural vegetation in buffer zones around raptor nesting trees remained undisturbed, and are people or pets regularly breaching restrictions within these buffer zones?

Examples of monitoring questions that focus on the raptors themselves include the following:

- Do raptors continue to use the retained habitat features, what time of the year, and how frequently?
- Do raptors regularly use artificial nest sites and other structures provided? Do the



artificial nest sites produce surviving young?

- Do collisions of raptors occur with windows and railings on sundecks and what mitigation measures were implemented?
- Are Barred Owls and Great Horned Owls affecting the use of habitats by small owls in project areas?

The level of detail required and the length of monitoring will depend on specific projects and objectives. Monitoring can simply include recording continued presence of a habitat feature (such as a roosting tree), its condition, and the use of this feature by raptors over time. Also, artificial nesting platforms and other structures deteriorate over time, and their periodic inspection is necessary to ensure that they remain in a functional condition. The above types of monitoring are often all that is required and may be carried out by trained volunteers. In special situations, it may be necessary to engage in more elaborate monitoring activities. For example, it may be important to know whether birds raise broods successfully in artificial structures or whether these structures increase productivity of the local population. In cases where birds need to be banded or active nests inspected, the monitoring must be led by professionals with specific training and the appropriate permits obtained.

See **Appendix B** for the  
Guidelines for Raptor  
Webcams

Whether monitoring activities are to be undertaken by volunteers or biologists, it is important that observations are collected and recorded in a standard way, according to a monitoring plan. To ensure that the data are useful, volunteers should be provided with datasheets and told exactly what information they are to record and how often.

Standard survey methods have been prepared for raptors in British Columbia (RISC 2001 [Inventory Methods for Raptors](#), Version 2.0 and [Avian Inventory & Monitoring Protocols](#)). Some of these methods, particularly those describing methods for “presence/not detected” intensity of effort, can be useful in monitoring the effectiveness of best management practices for raptors. It should be noted, however, that methods involving broadcast of recorded vocalizations should be used diligently and only when needed; their inappropriate use can disrupt behaviour of raptors and other birds. Many excellent field guides are available to help with accurate identification of raptor species in British Columbia and will help volunteers to record data accurately.

Monitoring programs often involve intensive follow-up efforts initially after the implementation of mitigation measures, and periodic monitoring thereafter. Monitoring activities should be carried out over multiple years to ensure that potential longer-term effects are detected and possible problem areas are identified as they arise.



Steps to monitoring raptors in urban and rural areas are:

- ☑ Prepare a monitoring plan that includes objectives, detailed methodology, and reporting requirements;
- ☑ Design monitoring programs with clear long- and short-term objectives;
- ☑ Determine who will conduct the monitoring activities (volunteers, biologists, other);
- ☑ Establish and maintain good rapport with volunteers and provide clear guidance on data collection and recording;
- ☑ Summarize results at periodic intervals (for example yearly); share results with and encourage feedback from other jurisdictions, provinces and countries conducting similar studies;
- ☑ Apply the results of monitoring to the refinement of mitigation and management measures on a continuing basis, as needed; and,
- ☑ Report observations of species at risk to the [Conservation Data Centre](#) to help with broader-scale conservation and population monitoring efforts.

*Establish and maintain a good rapport with volunteers.*

Photo: Judith Cullington







## 10. Species Accounts

The following accounts provide relevant information on the ecology and conservation of raptors in British Columbia (B.C.). Raptors that are most likely to occur in urban and rural habitats or are of special conservation interest are presented first, followed by those that seldom occur there. An excellent reference for additional information is *Raptors of the Pacific Northwest*.<sup>8</sup>

Range maps from the original version of this document had been revised and updated. The new maps are an estimation of the current potential breeding range for each species based mostly on information provided in *The Birds of British Columbia, Vol II*,<sup>9</sup> the [British Columbia Breeding Bird Atlas](#) and [eBird Canada](#). In a few cases, such as the Spotted Owl, ranges may also be based on in-house survey information. As such, they show the outward limits of each species potential breeding range in B.C. and therefore likely include some areas and habitats where species do not currently breed. Nonetheless, the potential for them to breed within these ranges cannot be discounted.

The [Committee on the Status of Endangered Wildlife in Canada](#) (COSEWIC) tracks the status of flora and fauna in Canada. Listing categories applicable to the species presented in this section are defined as:

- **Endangered:** A species facing imminent extirpation or extinction.
- **Threatened:** A species likely to become endangered if limiting factors are not reversed.
- **Special Concern:** A species of special concern because of characteristics that make it particularly sensitive to human activities or natural events.
- **Not at Risk:** A species that has been evaluated and found to be not at risk.
- **Not Listed:** A species for which there is no present need for evaluation.

In British Columbia, flora and fauna conservation concerns are assessed by the provincial [Conservation Data Centre](#) (CDC). Listing categories are as follows:

- **Red-listed:** Indigenous species, subspecies and natural plant communities that are **extirpated**, **endangered**, or **threatened** in B.C. Red-listed species and subspecies have, or are candidates for, official Extirpated, Endangered or Threatened status in B.C. Not all Red-listed taxa will necessarily become formally designated. Placing taxa on these lists flags them as being at risk and requiring investigation.
- **Blue-listed:** Indigenous species, subspecies and natural plant communities of Special Concern (formerly Vulnerable) in B.C. Blue-listed taxa are considered to be at risk and could become Red-listed if appropriate actions are not taken.
- **Yellow-listed:** Indigenous species, subspecies and natural plant communities which are not at risk in B.C. While not considered to be at risk provincially, some Yellow-listed taxa are regionally important.

<sup>8</sup> Bosakowski and Smith 2002

<sup>9</sup> Campbell et al 1990



### 10.1. Turkey Vulture (*Cathartes aura*)



Photo: ©Stuart Clarke

Identification (Length 67–80 cm; Wingspan 170–175 cm)

- Classified as a raptor in the Order *Accipitriformes*
- Large, dark, hawk-shaped with long wings and tail.
- Adults: Small unfeathered red head. Body and upperside of wings blackish or brownish-black. Underwing distinctive in flight; flight feathers silvery-grey, the rest of the wing is very dark. Underside of tail is grey. Beak is yellow.
- Immatures: Like adults but head and bill grey. First fall bird more brownish cast.
- Most often seen in flight. Perches in trees overnight and during early morning. On the ground only when feeding.
- Usually soars or glides, rocking from side to side, with rare wingbeats. Wings held upward in a broad “V”. (Note that several other raptors hold their wings in a “V” – though normally more horizontal than in Turkey Vulture). Steady flapping flight is uncommon, mainly during takeoff or adverse soaring conditions.
- Sexes similar in size and plumage.
- Turkey Vultures are not likely to be heard vocalizing.
- Most likely to be confused with eagles due to its large size (though smaller than eagles) and dark color. All Bald Eagles and immature Golden Eagles should show some white on the wings or tail. Two-toned underwings separate from all-dark appearing adult Golden Eagles. Rocking motion in flight is different than the steady flying of either eagle as is the dihedral (V-shaped) position of the wings, and also the relatively “headless” appearance dictated by the lack of feathers on the head.

Turkey vulture status:

COSEWIC: Not Listed

B.C. status: Yellow-listed

Range maps for all species were created using data from Campbell et al. (1990) and updated in 2012 with data from BC Breeding Bird Atlas and eBird Canada. See also Table 2 in [Section 8](#).



## Distribution

Turkey Vultures breed from southern Canada to southern South America and winter from the southwestern United States south. Seen occasionally nearly everywhere in southern B.C. south of about 55° N latitude, and is confirmed breeding on southern Vancouver Island, the south-coastal Mainland and in the Okanagan Valley north to Barriere, with possible breeding suspected across southern B.C. as far north as McBride and Anaheim.<sup>10</sup>

## Population Status

The Turkey Vulture is not a species at risk. Its extensive range and large population outside of Canada, its distinctive appearance, and the ease of observing it, make it one of the most recognized birds in North America. The Canadian population is roughly 5,000–20,000 pairs.<sup>11</sup> In B.C., its numbers and range are increasing, probably as a result of the greater availability of carrion along an expanding and busier highway system in the province.

## Movements

A few spring migrants arrive on the south coast by late February; larger numbers arrive later in spring and move farther north. During September and October most of the coastal population gathers on extreme southern Vancouver Island, particularly around Rocky Point, waiting for the right weather conditions to make the flight across Juan de Fuca Strait. Most leave the province by mid-October. Each year, a few birds remain throughout the winter in south coastal areas around the Lower Mainland and southern Vancouver Island. In southern interior, most Turkey Vultures arrive in April and are gone by October; however, there are widespread, sporadic sightings of them during winter.<sup>12</sup>

## Habitat

In general, open areas at fairly low elevation are the preferred foraging habitat of Turkey Vultures in B.C. On the coast they are seen flying over a variety of agricultural lands, rural areas, woodlands mixed with open areas, cliffs and other steep rocky terrain. They are also seen over a variety of rural and urban lands including golf courses, playing fields, and housing developments.

At night, Turkey Vultures often roost in groups. Communal roosts are usually located in large trees, preferably with fairly large horizontal branches (for ease of perching) and often in somewhat sheltered locations. This group roosting behaviour is thought to be important for social interactions and as a means of obtaining information about the foraging success of other vultures. Communal roost trees are located in relatively remote spots, undisturbed by humans.<sup>13</sup>

Turkey Vultures are quite specialized in their choice of breeding habitat. In western

<sup>10</sup> BC Breeding Bird Atlas 2012

<sup>11</sup> Kirk and Hyslop 1998

<sup>12</sup> Cannings et al. 1987; Campbell et al. 1990

<sup>13</sup> Kirk and Mossman 1998



North America, the vast majority of nests found are in steep, rocky terrain, the remainder occur in a variety of treed habitats. Only a few nests have been found in B.C. with about 90% on steep cliffs or rocky slopes and the rest in treed areas.<sup>14</sup>

### **Breeding**

The most important requirement for nesting habitat appears to be that the area be isolated from human disturbance.<sup>15</sup> The nest is built in an inaccessible location such as a small cave or crevice in a cliff, or amongst a pile of boulders. The eggs are usually laid directly on the substrate of rock, soil or wood, although some rudimentary nest-building may be done. The clutch size is two with 1–3 days between eggs. A wide range (28–41 days) of incubation length has been reported. The most likely period is near the high end of that range. Parents regurgitate well-digested food to feed the chicks. The young start to fly when they are about 60 days old though they stay near the nest, being fed by parents for another few weeks.<sup>16</sup>

### **Food Habits**

Turkey Vultures locate their food from the air. They soar and glide over open areas using their keen eyesight and sense of smell to locate dead animals. They are one of the few birds proven to have a sense of smell. The principal food of Turkey Vultures is carrion. Any type of dead animal appears to be scavenged by these birds including domestic animals, road-killed animals, offal at slaughterhouses and fish plants, spawned-out salmon, animal parts discarded by hunters, and beached marine mammals. In some situations, vegetable matter, and insects are eaten. Small, live animals may be taken in rare instances.

### **Compatibility with Human Landscapes**

Turkey Vultures are commonly seen flying over urban and rural areas on Vancouver Island and the Gulf Islands. They also occur in developed areas in the Okanagan and Kootenay valleys. Much of the food they find in developed areas is a result of human activities, including road-killed animals, rodents killed during haying, offal in garbage dumps, and domestic animal carcasses. Although often seen in developed areas, Turkey Vultures need undisturbed areas for nesting. They are vulnerable to disturbance at roosting sites. Very few nesting sites are known in the province, making it difficult to protect nests.

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14 Cannings et al. 1987; Campbell et al. 1990; Kirk and Mossman 1998

15 Kirk and Mossman 1998

16 Kirk and Mossman 1998



## 10.2. Osprey (*Pandion haliaetus*)



Photo: ©Stuart Clarke

Identification (Length 56–64 cm; Wingspan 147–183 cm)

- Classified as a raptor in the Order *Accipitriformes*
- Fairly large, long-winged raptor mostly white below, chocolate-brown above.
- Adults: White head with prominent dark eye-line. Upperparts dark brown. Underside of body white, throat variably streaked. Undersides of wings have conspicuous dark patches at the wrist. Flight feathers and tail barred brown and white.
- Juveniles: Like adults, but light-buff fringes on upperparts giving scaled appearance, buff fringes fade over first winter throat often more heavily streaked.
- Sexes nearly alike; females larger; often with heavier streaking on neck.
- In flight wings are angled-back at the wrist, unique among raptors of B.C. Soars with wings held in shallow arc.
- Their ability to hover while hunting is unusual for a raptor of this size.

[Osprey status](#)

COSEWIC: Not Listed  
B.C. status: Yellow-listed

[Sample vocalizations](#)

### Distribution

Ospreys occur on every continent except Antarctica. In North America, Ospreys breed nearly throughout the continent south of the treeline. In B.C., Ospreys are widespread breeders, common in the south, rare in the north. Rare visitors to Haida Gwaii, they are not known to breed there.<sup>17</sup> Most North American Ospreys move to Central and South America for the winter.<sup>18</sup>

<sup>17</sup> Campbell et al. 1990

<sup>18</sup> Poole et al. 2002





## Population and Status

The Osprey is not a globally threatened species. The world population is unknown, but thought to be fairly large. The North American population is likely more than 30,000 pairs and increasing. Canada is home to more than 10,000 pairs.<sup>19</sup>

## Movements

Most Ospreys that breed in western North America winter in Central and South America; very small numbers stay as far north as Oregon and California. The majority leave the province by early October and return in April. On the coast some spring migrants arrive as early as late February and some stay in the fall as late as November.<sup>20</sup> In the interior, Ospreys arrive later in the spring and leave earlier in the fall compared to the coast.

Young Ospreys often linger in B.C. for a couple of weeks longer in the fall than adults do before migrating south. Young birds remain at their wintering areas until their second or third calendar year before returning north.<sup>21</sup> When the young birds return north they generally return to the area where they were hatched.<sup>22</sup>

## Habitat

Suitable Osprey habitat only occurs in areas with accessible, live fish. Salt, brackish and fresh water in many habitats are used for foraging. Ospreys capture their prey near the surface of the water. As a result, they are most abundant in areas with shallow waters that improve access to fish.<sup>23</sup>

In B.C., breeding Ospreys are concentrated in valley bottoms, although some pairs nest at higher elevation lakes.<sup>24</sup> Ideal nest sites are close to water, and the air space around the nest is open, giving the birds' clear access for landing and takeoff, and a good view of the surrounding area while on the nest. In B.C., natural nest sites are trees; in other parts of their range they also use cliffs or the ground. Ospreys readily nest on artificial platforms erected specifically for that purpose or on many other human-made structures not intended for them (such as power poles, pilings, and channel markers).<sup>25</sup> Ospreys nest in loose colonies in areas with good foraging opportunities and abundant nesting structures, such as near the Williston Reservoir.<sup>26</sup>

## Breeding

In the spring, adult Ospreys usually return to their nest site of the previous year, the males arriving earlier. Nests are reused year after year.<sup>27</sup> Eggs are laid soon after a new nest is built or the old nest refurbished. Ospreys lay 1–4 eggs; three is the most

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- 19 Poole et al. 2002
  - 20 Campbell et al. 1990
  - 21 Poole et al. 2002
  - 22 Poole et al. 2002
  - 23 Poole et al. 2002)
  - 24 Steeger 2003
  - 25 Poole et al. 2002
  - 26 Steeger 2003
  - 27 Poole et al. 2002



common clutch size.<sup>28</sup> The incubation period is variable. In one study, it was 36–42 days.<sup>29</sup> Females do most of the incubation while the male provides her food.<sup>30</sup> The young fledge when they are about 50–55 days old<sup>31</sup>. After leaving the nest the young stay in the area, and are dependent on the adults for food for at least 10–20 days, often returning to the nest where the adults bring food for them.<sup>32</sup>

### Food Habits

Ospreys use two hunting techniques, hunting on the wing or hunting from a perch. When hunting from the air, Ospreys fly about 10–40 m above open water searching for prey. When prey is spotted, the bird dives feet first to the water and grabs it with its talons and carries it off.<sup>33</sup> Hunting from a perch (rarely seen in B.C.) is similar except that prey is spotted while the Osprey is perched on a structure with a good view of feeding habitat.

Ospreys feed nearly exclusively on live fish; at least 80 fish species have been recorded in their diet. Prey fishes usually weigh about 150–300 grams and are about 25–35 cm in length. Other foods, though very rarely noted, include snakes, birds, small mammals, amphibians, and carrion.<sup>34</sup>

Ospreys have highly modified, large feet with long, sharp curved talons. The fourth toe is reversible, allowing the bird to position two toes forward and two backward when grasping prey. Additionally, the bottoms of the feet are covered in rough scales that are modified into sharp points (spicules). This unique foot structure helps the bird to grip slippery prey.<sup>35</sup>

### Compatibility with Human Landscapes

Ospreys readily build nests on human-made structures, often in close association with human activity. Their frequent use of power poles at some locations for nest sites has spurred the placement of alternate poles with nesting platforms attached so as to avoid electrocutions and interference with power supplies.

Local declines of fish resources may also impact local populations of Ospreys.

Competitors of Ospreys in B.C. include Bald Eagles and Great Blue Herons, which can compete for fish, and Canada Geese which can compete for nests. A study in southeastern B.C. showed that about 50% of returning Osprey pairs found Canada Geese already using their nest. This resulted in delayed laying, reduced clutch size, reduced brood size, and a reduced number of fledglings.<sup>36</sup>

Several human-induced factors benefit Ospreys, including the following:

- 
- 28 Poole et al. 2002
  - 29 Steeger et al. 1992)
  - 30 Poole et al. 2002
  - 31 Poole et al. 2002
  - 32 Poole et al. 2002
  - 33 Poole et al. 2002
  - 34 Poole et al. 2002
  - 35 Poole et al 2002
  - 36 Steeger 2003

- The creation of reservoirs has increased Osprey habitat and populations in some regions;
- Intensive fisheries management programs that stock lakes with trout or that bolster natural productivity (e.g., lake fertilization);
- Erection of artificial nest platforms in suitable areas;
- Improved water quality and clarity in fish-bearing lakes;
- Nest guards to deter predators;
- Maintaining large trees with nest-site potential.

### 10.3. Bald Eagle (*Haliaeetus leucocephalus*)



Identification (Length 79–94 cm; Wingspan 178–229 cm)

Photo: Judith Cullington

## Bald Eagle status

COSEWIC: Not at Risk

B.C. status: Yellow-listed

## Sample vocalizations

- Classified as a raptor in the Order *Accipitriformes*
- Very large, mostly dark, broad-winged raptor.
- Adults: Head and tail white, body and wings dark brown-black. The eyes, bill, legs, and feet are yellow.
- Immatures: Gradually attain adult plumage over 4–6 years. During that time they are mostly dark brown with variable irregular whitish patches and isolated pale feathers especially on the undersides.
- As is the case with virtually all raptors, females are larger than the male.
- Soars with wings held flat. Flapping flight is powerful and steady.
- Bald Eagle has a larger head, shorter tail, and straighter trailing-edge to wings



than Golden Eagle. White areas on underside of immature Golden Eagle more sharply defined, regular and symmetrical. Both eagles are larger, shaped differently and have a steadier flight than Turkey Vulture.

### **Distribution**

Bald Eagles breed from extreme northern Mexico, north to the treeline. Their centre of abundance is the northwest, especially Alaska and B.C. In B.C., nesting Bald Eagles are abundant near the coast, common in the southern interior and uncommon in the northern interior. They winter abundantly on the coast and fairly commonly in the interior where water remains ice-free.<sup>37</sup>

### **Population Status**

In 2000, an estimated 100,000 Bald Eagles lived in North America which is the entire world population.<sup>38</sup> During the early 1990's about 4,500 pairs of Bald Eagles nested annually in B.C. and about 20,000–30,000 Bald Eagles spent the winter.<sup>39</sup> The population has been increasing since the 1960s. In B.C., the population is close to carrying capacity and is stable.<sup>40</sup> In 2004, based on habitat suitability extrapolations, the continental population was estimated at 320,000, with 160,000 in Canada, 60,000 of them in B.C.<sup>41</sup> Though these estimates may be high, they do give an upper population estimation limit and do indicate that the population is healthy and recovering in areas it had declined.

### **Movements**

Bald Eagles move between nesting and wintering areas and between seasonal sources of abundant food. Some pairs on the coast are resident at their nesting sites. Bald Eagles that breed in northern and interior parts of the province migrate south to the United States for the winter. Many of the Bald Eagles that winter on the B.C. coast breed in Alaska. Many Bald Eagles from the south coast and other areas move during summer to Alaska to take advantage of the earlier salmon spawning season. These birds will move south again gradually as the spawning season progresses to more southern rivers.

### **Habitat**

Bald Eagles are nearly always near water although they use many habitats over their large range. Good breeding areas can be in a variety of forest and landscape types but usually have two things in common, large trees for nesting and abundant food. These two requirements are present nearly everywhere along the coast. Abundant food sources are not a feature of the interior of the province, and consequently, Bald Eagles are not as abundant there. In the interior most nests are close to rivers, lakes, marshes or other wetland areas.

37 Campbell et al. 1990

38 Buehler 2000

39 Farr and Dunbar 1988 in Blood and Anweiler 1994

40 Buehler 2000

41 Rich et al. (2004); [http://www.rmbo.org/pif\\_db/laped/](http://www.rmbo.org/pif_db/laped/)



Bald Eagles spend a lot of time perched in tall trees affording a good view, usually located along shores. These trees probably serve as a lookout station while watching prey or other eagles as well as a resting spot for preening and other activities. They congregate in fairly large numbers in the winter at abundant food sources such as salmon, herring, and eulachon spawning areas, and garbage dumps.

During the winter, Bald Eagles may roost communally during the night.<sup>42</sup> The same trees, usually old-growth conifers, are typically used for many years and are located in the vicinity of an abundant food source. The trees used for communal night roosts are often larger than surrounding trees. The purpose of communal roosting is likely as a sheltered location as the roosts are more used during cold weather and shortages of food. During very poor weather, the eagles may stay in the roost all day. Communal roosting may also be important for various social and non-social activities as well.<sup>43</sup> A good example of this is around the Squamish/Brackendale area where some land has been set aside to protect eagle winter roosts.

### Breeding

Bald Eagles can use a variety of sites for nesting including cliffs, the ground, and small to large trees. In B.C., with very few exceptions (on treeless offshore islands), Bald Eagles build their nests in tall sturdy trees usually within a few metres of the top.<sup>44</sup> The structure of the tree, its location and the arrangement of surrounding landscape features are the most important factors an eagle uses to determine if a tree is suitable. The tree may be alive or dead, coniferous or deciduous. Bald Eagle nest trees generally are located close to water and a food source and must be strong enough to hold their heavy nests. The nest site must have clear air space around it, giving a good view of the surrounding area and be approachable from different directions for easy access during different wind directions.<sup>45</sup> Nests are built of dead sticks with a nest cup lined with grasses, bark, fresh conifer boughs, and moss. Nests may be used for many years, additional branches and other material being added each year.

One to four alternate nests may be in a single nesting territory and different nests may be used in different years. In good habitats such as coastal areas of B.C., a territory radius of approximately 2.5 km is typical.<sup>46</sup> Bald Eagles begin nest-building activities several weeks before egg-laying. One to three eggs are laid, but most often the clutch is of two eggs. In B.C., eagles start laying as early as February on the south coast, later in the rest of the province. Incubation starts with the first egg and takes about 35 days. Thus the eggs hatch at one to four day intervals, resulting in chicks of uneven age. Both adults bring food to the young. Young birds leave the nest at 8–14 weeks of age and associate with parents for several weeks more.<sup>47</sup>

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42 Yackel Adams et al. 2000  
 43 Yackel Adams et al. 2000  
 44 Blood and Anweiler 1994  
 45 Blood and Anweiler 1994  
 46 USFWS 1986  
 47 Buehler 2000)





## Food Habits

Bald Eagles locate food while perched or flying. Often the tallest tree in an area is chosen by Bald Eagles as a perch tree. From a tall tree on the shore, eagles are capable of spotting food floating in the water a long way offshore (many hundreds of metres).

Bald Eagles are strictly carnivorous and are able to exploit a great variety of food sources. In B.C. the primary food is fish. Many different species of fish are captured live, scavenged dead from the shore or water, or stolen from other birds. Birds of various types, particularly waterfowl and seabirds are the second most important source of food. Mammals make up the next most important type of food from live capture of rabbits and other small mammals to the carcasses of whales, sea lions and large ungulates. Eagles also feed at landfills on human garbage.<sup>48</sup>

## Compatibility with Human Landscapes

Considerable progress has been made throughout North America to return Bald Eagles to historical numbers after the devastating effects of contamination during the DDT-era and persecution under predator control programs. Bald Eagle numbers in B.C. and Alaska were not as seriously affected by the adverse effects of DDT as in other locations in North America, and populations in B.C. are healthy and increasing. Poisoning, trapping, shooting, electrocution, and collisions with stationary objects or vehicles contribute to mortality in urban/rural landscapes. A recent ban on the use of lead shot for hunting waterfowl was instigated, in part, due to the documented mortality of eagles that ingested waterfowl with lead pellets in their bodies. The removal of nestlings and eggs at the nest by corvids (crows, ravens, jays), hawks and owls, and mammalian carnivores has been documented and may also impact populations. The loss of shoreline nesting, perching, roosting, and associated aquatic foraging habitat to human development represent the most significant components of habitat loss to Bald Eagles throughout their range. Tolerance of human disturbance varies throughout the range of the Bald Eagle and is likely increasing in B.C. as a result of decreasing human persecution of the species. Bald Eagles are increasingly found nesting in urban parks or woodlots and close to housing as populations increase and citizens provide better stewardship of nest sites.

A substantial threat to Bald Eagle nesting habitat in the urban/rural areas is the possible future removal of large trees used for nesting primarily due to safety considerations and for land-clearing and logging. Many veteran Douglas-fir trees are infected with fungal root diseases<sup>49</sup> and may be rated as dangerous by current safety standards for some work activities around them.<sup>50</sup> Recruitment of similarly large replacement trees will take decades, so the quality of nest site availability will decrease in urban/rural areas over the short term.

48 Blood and Anweiler 1994

49 Allen et al. 1996

50 Wildlife Tree Committee 2001



Bald Eagles often select mature and old-growth coniferous forests for roosts, usually along rivers or lakes, because of the energetically advantageous microclimate afforded by conifer roosts. Winter food shortages could naturally limit eagle numbers, and associated food stress could also lower the birds' reproductive performance after they leave the wintering grounds.

Several factors benefit Bald Eagles:

- Maintenance of large, veteran trees—particularly those within 200 m of a marine or lake shoreline—to serve as nest sites and perching sites;
- Fisheries conservation measures that maintain stocks of salmon, eulachon, and herring; and
- Wetland enhancement that increases the number of waterfowl and other prey.

#### 10.4. Northern Harrier (*Circus cyaneus*)



Identification (Length 41–58 cm; Wingspan 97–122 cm)

Photo (Immature  
*C. cyaneus*):  
©Stuart Clarke

- Classified as a raptor in the Order *Accipitriformes*
- Medium-sized, slim-bodied hawk with long narrow wings and long tail.
- Adults: Owl-like facial disk. Distinctive white-patch on rump in all plumages. Male has grey head, back, upper wings. Underside of body white lightly spotted on breast. Underwings white except tip of wings and trailing edge black. Long tail is banded. Eyes are yellow.
- Females: Very different from adult males. Brown on head, back and upperwings, underparts are buffy, with heavy brown streaks. Underwings mostly brown.

Northern Harrier status

COSEWIC: Not at Risk  
B.C. status: Yellow-listed



- Immatures: Similar to adult females but underside of body rufous, streaked only on breast; rufous fades whitish-buff by spring.
- In flight holds wings uptilted in shallow V. Generally flies low, flight is buoyant and weak for a raptor, often tilting from side-to-side. Soars mainly during migration.
- Combination of white rump and facial disk unique. With practice, long wings and tail, up tilted wings and manner of flight can be used to identify this raptor even at long distances.

[Sample vocalizations](#)  
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### Distribution

Northern Harriers occur widely in northern Europe, Asia, and North America. In North America, they breed from the treeline south to the central United States and winter in the northern part of South America. In B.C., they breed widely but sparsely throughout interior and northern regions. They can occur anywhere in the province during migration and winter mainly in the Fraser Lowlands. Small numbers winter throughout the southern interior, particularly in the Okanagan.

### Population Status

The Northern Harrier is not a species at risk. The North American population is estimated at more than 110,000 birds and the Canadian population at 20,000–50,000 pairs.<sup>51</sup>

### Movements

Spring migrant Northern Harriers start to move through southern B.C. in late March and by mid-April migrants have reached the Peace River area.<sup>52</sup> By October, most have left interior regions.

### Habitat

In B.C., Northern Harriers use a wide range of habitats at all times of the year. In general, Northern Harrier habitat is characterized by open areas. Breeding habitat in B.C. is fairly low elevation uncultivated open areas. Nests occur in a variety of wetlands and occasionally in dry sites.

During migration Northern Harriers can occur in nearly any habitat from alpine meadow, to sagebrush, to coastal mudflat. They often hunt over agricultural fields during migration and the winter. On Vancouver Island, where they are very scarce during migration and the winter, they are usually seen in areas of mixed farmlands and pastures, at estuaries, and at freshwater wetlands. The Fraser Lowlands is the major wintering grounds for raptors in B.C. Northern Harriers are the second-most numerous raptor (behind Red-tailed Hawk) in the Fraser Lowlands, where they use agricultural fields, freshwater wetlands and coastal marshes.<sup>53</sup> They prefer foraging in

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51 MacWhirter and Bildstein 1996  
52 Cannings et al. 1987; Phinney 1998  
53 Campbell et al. 1990



wet marshy fields and fields with abundant vegetation over sparsely vegetated places such as over-grazed rangeland.<sup>54</sup>

### **Breeding**

Northern Harriers build nest platforms of marsh vegetation such as sedges, grasses and bulrushes on or very near the ground—usually in wetlands. The usual clutch of 5–6 eggs is laid in a nest cup on top of the nest platform. Eggs are incubated for about 30–32 days. About two weeks after hatching the young can leave the nest and move about in the nearby vegetation, at about 5–6 weeks they can fly fairly well. The adults feed the chicks for a few weeks longer until they leave the nesting area during the summer.<sup>55</sup>

### **Food Habits**

Northern Harriers hunt exclusively on the wing. Generally, they fly about 3–5 m above the ground while looking for prey and can hover momentarily when a prey item is spotted (hence the name “harrier”). They steal prey from other Northern Harriers on occasion.

Small mammals make up most of the Northern Harrier’s diet. Rodents of many species are taken; *Microtus* voles are the most important type in most regions. Birds, reptiles, frogs, and a few insects are also taken.

### **Compatibility with Human Landscapes**

In-filling of wetlands, over-grazing of pastures, diminished hedgerows, intensively cultivated fields, and pest control have reduced prey availability and hunting habitats for Northern Harriers. Development of agricultural areas and shoreline habitats for housing developments decreases the availability of prey. Northern Harriers may also be at risk of pesticide contamination.

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54 MacWhirter and Bildstein 1996

55 MacWhirter and Bildstein 1996



## 10.5. Sharp-shinned Hawk (*Accipiter striatus*)



Photo: ©Stuart Clarke

Identification (Length 24–36 cm; Wingspan 51–71 cm)

- Classified as a raptor in the Order *Accipitriformes*
- Small, short-winged hawk with long narrow tail.
- Adults: Much like Cooper's Hawk but smaller and colour of crown is the same as the back. Blue-grey upperparts, rufous and white barred underparts. Square-tipped tail has four dark bands and a narrow white tip. Eyes are orange to red.
- Immatures: Brown backs and upperwings, creamy underparts heavily streaked with brown on belly and breast. Eyes are yellow.
- Females are larger than males.
- Usually flies with a series of flaps interspersed with short glides. Soars at times.
- Has square-tipped tail often appearing notched, unlike round tipped tail of Cooper's Hawk. In flight, head even with or slightly behind leading edge of wing; Cooper's Hawk has a relatively larger head which projects forward of the wings. Tail relatively shorter than in Cooper's Hawk. Colour of crown not darker than back, not appearing capped.

Sharp-shinned Hawk  
status

COSEWIC: Not at Risk  
B.C. status: Yellow-listed

[Sample vocalizations](#)  
©Naturesongs

### Distribution

The Sharp-shinned Hawk breeds south of tundra regions from central Alaska, east to Newfoundland, and south to the northern and western United States. During winter it is found along the Pacific coast from south coastal Alaska, coastal and southern B.C., southern Ontario and Quebec, south to Costa Rica.<sup>56</sup>

<sup>56</sup> Bildstein and Meyer 2000





## Population Status

The Sharp-shinned Hawk is not a species at risk. It has a wide breeding range and at present is common in most of that range. This is another raptor species whose numbers declined during the mid-1900s then rebounded after bans on some toxic pesticides were imposed in the United States and Canada.<sup>57</sup>

## Movements

Many Sharp-shinned Hawks in eastern North America make long migrations along traditional routes. Thousands are counted at hawk watches each fall as they move south. The spring movement is not as concentrated. Such large numbers of Sharp-shinned Hawks are not seen in B.C. at a single site, perhaps because virtually the whole province is a series of north-south mountain ranges and ridges (prime migration routes). Nevertheless, large numbers migrate through the province. Sharp-shinned Hawks start to migrate north through the southern interior of B.C. in early April and through the northern regions during May. Southbound migrants are widely seen during September and October.

## Habitat

Sharp-shinned Hawks breed in forests of many types from sea level to high elevations. Migrating Sharp-shinned Hawks can be seen almost anywhere in the province from downtown Vancouver to high alpine ridges. They migrate during the day and tend to follow linear features like ridges, rivers, lake, river and coastal shorelines, frequently soaring on the updrafts that many of these landforms create. Flap-and-glide flight is also used during migration.

During the winter, Sharp-shinned Hawks utilize nearly every low elevation habitat with trees and shrubs on Vancouver Island, the Fraser Lowlands and the Okanagan Valley. Prime winter habitat includes such habitat around agricultural fields, hedgerows, mixed woodland, open fields, and residential areas; anywhere likely to have a large population of small birds, their primary prey.

## Breeding

Sharp-shinned Hawks are very secretive during nesting until the young leave the nest. Very few nests have been found in B.C. An active nest in Campbell Valley Park in the Fraser Valley was in a medium-size conifer less than 100 m from a parking lot and close to several walking trails.<sup>58</sup> They build fairly large nests of sticks close to the trunk of a medium-sized conifer. The clutch of 4–5 eggs is incubated for about 30–32 days. The parents feed the young hawks in the nest for 3–4 weeks and out of the nest near the nesting territory for another 3–4 weeks.<sup>59</sup>

<sup>57</sup> Bildstein and Meyer 2000

<sup>58</sup> M. Bentley, pers. obs.

<sup>59</sup> Bildstein and Meyer 2000



## Food Habits

Sharp-shinned Hawks often hunt by flying stealthily toward potential prey and making a quick surprise attack. They will use vegetation, rises in landscape, or other obstacles to shield themselves from the prey's view. They also hunt by sitting quietly in a concealed spot until prey is sighted then making a quick attack.

Small birds up to the size of American Robin (*Turdus migratorius*) are the principal food of the Sharp-shinned Hawk. Small mammals are a much less important part of the diet.

## Compatibility with Human Landscapes

Sharp-shinned Hawks do not usually nest in urban or rural areas in B.C. However, during migration and winter they frequently use urban and rural areas in southern B.C.—particularly near woodlands and shrubby habitats that support populations of small birds.

### 10.6. Cooper's Hawk (*Accipiter cooperii*)



Identification (Length 36–51 cm; Wingspan 74–94 cm)

Photo: ©Jared Hobbs

- Classified as a raptor in the Order *Accipitriformes*
- Small- to medium-sized hawk with relatively long tail and short rounded wings.
- Adults: Dark blue-grey upperparts and rufous and white barred underparts. Crown darker than nape and back, the rest of head is greyish. Throat white with narrow dark streaks. Grey tail is crossed by four broad straight dark bars has a narrow white tip. Iris is orange to red.
- Immatures: Upperparts brown with white mottling and rufous edges. Underparts have dark streaks on creamy breast and belly. Iris is pale yellow.

Cooper's Hawk status

COSEWIC: Not at Risk  
B.C. status: Yellow-listed

[Sample vocalizations](#)  
©Naturesongs



- In level flight alternates several quick flaps with a short glide. Soars often.
- Can be difficult to distinguish from the Sharp-shinned Hawk. Structure and tail shape are the best identification features—Cooper's Hawk has comparatively longer tail with a rounded tip. Compared to the Sharp-shinned Hawk, adult Cooper's Hawks have a darker cap that contrasts more with the nape and back. In flight, the head projects forward of the leading edge of the wing, whereas the Sharp-shinned Hawk's head is even with, or behind the wrists. Can also be confused with the Northern Goshawk which is larger, has different proportions, and 5–6 irregular bars across the tail or the (rare in B.C.) Broad-winged Hawk which has a much shorter tail.

### **Distribution**

Cooper's Hawks breed throughout the southern half of North America, withdrawing from the coldest interior areas during winter. They have been expanding their range northwards in B.C. and are now known to breed as far north as Ft. St John with some sight records further north than that. They winter on the south coast and in the Okanagan area.

### **Population Status**

The Cooper's Hawk is not a species at risk. In western North America, the population is thought to be stable.<sup>60</sup>

### **Movements**

Migrating Cooper's Hawks use a broad range of habitats ranging from alpine to sea level in southern B.C. They migrate singly during the day. The peak of spring migration is in late April. Autumn migration is more extended; from late August to November.<sup>61</sup> In the Victoria area, many Cooper's Hawks are year round residents, though some may be migratory, likely using the Pacific Flyway.<sup>62</sup>

### **Habitat**

Though a bird of the forest over most of their range, Cooper's Hawks also breed in urban and rural habitats as long as there are suitable nesting trees. In spite of habitat fragmentation and human disturbance, Cooper's Hawks will nest in large trees in small patches of forest surrounded by residential and commercial developments. They are strongly territorial and usually nest in the same territory year after year.<sup>63</sup> Andy Stewart (retired) of the B.C. Ministry of Environment conducted a long-term study of Cooper's Hawks in the Victoria area from 1995 to 2010; most of the nests located were on privately owned urban/suburban properties or in municipal parks.

<sup>60</sup> Rosenfield and Bielefeldt 1993

<sup>61</sup> Campbell et al. 1990)

<sup>62</sup> A. Stewart, pers. comm.

<sup>63</sup> Rosenfield and Bielefeldt 1993



## Breeding

Cooper's Hawks build their nest of sticks or they may use a stick-nest built by another bird species in a previous year. The nests are often lined with bark chips. Usually 3–5 eggs are laid with 2–3 days between each egg. Eggs are incubated for 30–36 days. Eggs hatch in the same order in which they were laid and at about the same interval, resulting in uneven aged chicks. The female does most of the incubation while the male supplies most of the food. The young leave the nest when about five weeks old and the family group remains together in the vicinity of the nest for another week or so.<sup>64</sup>

## Food Habits

Several strategies are used by Cooper's Hawks when hunting. Probably the most-used technique is perching in a concealed spot in a tree and watching for potential prey. When prey is spotted, the hawk makes a short fast ambush attack on the prey. They may also fly low and fast, using objects like bushes, dykes, or ridges to conceal their approach then surprising prey with a sudden, quick attack. The diet varies geographically and seasonally and is mostly composed of birds and small mammals. In urban areas around Victoria, alien invasive species such as Rock Pigeons, European Starlings, House Sparrows, and Grey Squirrels constitute a significant portion of their diet, making them a very useful urban predator.<sup>65</sup>

## Compatibility with Human Landscapes

The Cooper's Hawk is one of the most common raptors in the urban/rural areas of southern B.C.—particularly Greater Victoria. Because they readily nest in developed areas, a popular misconception is that they are very tolerant of human disturbance and habitat alteration.<sup>66</sup> This is probably not the case except on a very limited basis. What has likely happened is that Cooper's Hawks have moved into the urban environment in response to the presence of a good food supply and adequate nest sites. Most nests have been found in mature neighbourhoods with large trees, or in parks and undeveloped areas adjacent to residential land. It has been suspected that disturbance to nest sites and major habitat alteration from new developments would adversely affect local populations, but Rosenfeld et al. (1986) found Cooper's Hawks thriving in highly urbanized areas in Wisconsin.

64 Rosenfeld and Bielefeldt 1993

65 A. Stewart, pers. comm.

66 Rosenfeld et al. 1986



## 10.7. Northern Goshawk (*Accipiter gentilis*)



Photo: ©Stuart Clarke

Identification (Length 46–66 cm; Wingspan 98–117 cm)

- Classified as a raptor in the Order *Accipitriformes*
- Large, long-tailed hawk with relatively short wings.
- Two subspecies in B.C. differing most in colour tone and extent of dark areas, size and distribution.
- Adults: Dark crown is separated from dark back and greyish face by a conspicuous white eyeline. Eyes are red. Upperparts are dark blue-grey. Underparts are white with fine grey barring. Tail is broad, somewhat wedge-shaped and crossed by 4–5 irregular bars.
- Immatures: Upperparts are brown. Underparts are whitish, heavily streaked with brown. Eyes are yellow.
- Females are larger than males.
- Adults when well seen are unmistakable. Immatures can be difficult to distinguish from immature Cooper's Hawks. Northern Goshawks are larger, have a subtly different shape, shorter tail, and usually a much more distinct eyeline. In flight head extends farther forward than on Cooper's Hawk and tail is broader and more rounded at tip.

Northern Goshawk  
status

*A. g. atricapillus*  
COSEWIC: Not at Risk  
B.C. status: Yellow-listed

*A. g. laingi*  
COSEWIC: Threatened  
B.C. status: Red-listed

[Sample vocalizations](#)  
©Naturesongs

### Distribution

The Northern Goshawk is widespread in north temperate regions of Europe, Asia, and North America. In North America, breeds south of tundra regions from western Alaska to Newfoundland south to the northern United States in the east and to central Mexico in the west.





## Population Status

Globally, the Northern Goshawk is not at risk. Its large range in North America still has many vast areas of relatively remote forest and mountain areas where good Northern Goshawk habitat exists. However, there are concerns that logging is reducing the amount of good habitat in parts of its range and causing population declines. Two subspecies occur in B.C. *A. g. atricapillus* occurs throughout the interior mainland, while *A. g. laingi* occurs west of the Coast Mountains along the coastal mainland plain and offshore islands including Vancouver Island and Haida Gwaii. The coastal *laingi* subspecies is Red-listed in B.C. and designated as Threatened by COSEWIC. Recent genetic works suggests that the *laingi* population on Haida Gwaii is mostly resident and may have been separated long enough to warrant distinct subspecies status. On Haida Gwaii, the low number of potential territories (20–30), low productivity (two or fewer young per successful breeding pair, and the low number of territories annually fledging young (less than 23%, 1996–2012)<sup>67</sup> make protection of this population critical.

## Movements

The Northern Goshawk is largely non-migratory in B.C., although individual birds may move into lower elevation or more open habitats like agricultural areas during the winter. Goshawks may occasionally use urban and rural environments at this time. Large numbers of Northern Goshawks, like several other species of raptors, have been documented to migrate south during years of the 10-year Snowshoe Hare cycle when prey abundance is low.

## Habitat

Mature and old-growth coniferous forests at a wide range of elevations (mostly below 900 m for the *laingi* subspecies) are used for breeding. A variety of deciduous and mixed forest habitats are also used. Prime habitat consists of forest stands with large trees and a high percent of canopy cover, situated on a gentle slope.<sup>68</sup>

Foraging habitat is varied and includes primarily mature and old-growth forests. It is occasionally seen in city parks like Stanley Park in Vancouver where there is an abundance of suitable forest habitat and large populations of squirrels, rats, skunks, songbirds, and waterfowl—all potential prey. Very rarely, they are observed in winter using the open flat areas of Delta with its large population of potential prey.

## Breeding

Northern Goshawks are very secretive during the nesting cycle. They build their fairly large nests of sticks and twigs in a variety of coniferous and deciduous trees. Two to four eggs are laid during April and May. The incubation period is 28–32 days. The young stay in the nest for about five weeks.<sup>69</sup>

67 F. Doyle, pers. comm.; Doyle 2012

68 McClaren 1999

69 Squires and Reynolds 1997

Northern Goshawks hunt mainly by perching for several minutes at a time, scanning the surroundings, then moving to another perch and doing the same. A variety of other strategies have been observed including chasing and harassing an animal in vegetation until it flushes into the open, rapid flights along edge habitat hoping to take something by surprise, or even chasing prey on the ground.<sup>70</sup>

## Compatibility with Human Landscapes

### 10.8. Swainson's Hawk (*Buteo swainsoni*)



Identification (Length 43–55 cm; Wingspan 120–137 cm)

- Classified as a raptor in the Order *Accipitriformes*
- The Swainson's Hawk is about the same size and shape as the Red-tailed Hawk, though its wings are narrower and more pointed at the tip. The plumage is

71 Ethier 1999



extremely variable with light and dark morphs and a full range of intergrades.

- The head, neck and chest of light birds (most common) are a dark sepia brown contrasting with the rest of the ventral surface, and the flight feathers of underwings are dark contrasting with light ones on the body of the underwing.
- The tail is banded with black and white. Often looks all dark from above in flight with a pale rump similar to the Northern Harrier.
- Often flies with wings held slightly uptilted. Often seen soaring.

Swainson's Hawk status

COSEWIC: Not Listed  
B.C. status: Red-listed

[Sample vocalizations](#)  
©Naturesongs

## Distribution and Status

Swainson's Hawk occurs widely but locally in mainland B.C. The main breeding areas in B.C. are in the region of the Thompson and Okanagan valleys. A few also breed in the Bulkley Valley near Hazelton and recently the BC Breeding Bird Atlas Project has identified probable breeding records in the vicinity of Prince George and Quesnel.<sup>72</sup> It is occasionally seen in the Lower Mainland and on southern Vancouver Island during migration.<sup>73</sup>

## Habitat

Swainson's Hawks build their large stick nests in trees.<sup>74</sup> Typical habitat of Swainson's Hawk is open grassland and woodlands. Agricultural land with available nest trees is also used. In B.C., most nests have been found in open agricultural, grassland and wetland habitats with nearby woodlands.

## Food Habits

Hunts mainly by soaring over open areas with short vegetation while searching for potential prey. During the breeding season, this species preys mainly on small mammals, birds and reptiles.

## Compatibility with Human Landscapes

The Swainson's Hawk frequently uses rural and agricultural areas of the southern interior of B.C. They sometimes nest and forage close to roads, buildings and other human developments.<sup>75</sup>

72 <http://www.birdatlas.bc.ca/english/index.jsp>  
73 eBird Canada 2012 <http://ebird.org/content/canada>  
74 England et al. 1997  
75 M. Chutter, pers. comm.



## 10.9. Red-tailed Hawk (*Buteo jamaicensis*)



Photo: ©Jared Hobbs

Identification (Length 45–56 cm; Wingspan 101–145 cm)

- Classified as a raptor in the Order *Accipitriformes*
- Medium-sized, stocky, broad-winged hawk with short broad tail.
- Highly variable plumage; several subspecies and intergrading morphs in B.C.
- Adults: Light birds are generally brown above and light below with variable amounts of spotting and streaking. Red tail above and below is distinctive. Dark birds may appear nearly all black except for red tail. Harlan's Hawk (*B. j. harlani*), a very dark subspecies that occurs rarely in B.C., is the exception; its variable tail is usually greyish with streaks with a dark tip. Some raptor experts believe the Harlan's Hawk to be a separate species.<sup>76</sup>
- Immatures: Similar to adults but tail finely barred brownish or greyish, not red. Gradually acquires red tail during second year. Wings and tail longer than adult.
- Powerful and versatile in flight. Commonly soars. A flap and glide flight pattern when several quick flaps are followed by a short glide is very frequent.
- Because of the widely variable plumage, it can be difficult to identify unless the red tail is seen. In B.C., Red-tailed Hawks are most likely to be confused with Rough-legged Hawks, which have longer, narrower wings and black wrist patches, compared to the Red-tailed Hawk's black patagium (the area of the forewing between the shoulder and wrist).

Red-tailed Hawk status

COSEWIC: Not at Risk  
B.C. status: Yellow-listed

[Sample vocalizations](#)  
©Naturesongs

<sup>76</sup> Bill Clark, pers comm.



## Distribution

Red-tailed Hawks occur throughout North America from the Arctic treeline to Panama.<sup>77</sup> They are common throughout most of B.C.

## Population Status

Common nearly everywhere in its large range, the Red-tailed Hawk is not a species at risk. Numbers have increased in eastern portions of range due to the change of large tracts of forest to a mosaic of fields and woodlots. The population has also increased in plains areas of North America, in response to increased availability of nesting trees in formerly treeless areas.<sup>78</sup>

## Movements

Most Red-tailed Hawks in northern regions leave their breeding territory and move south to more favourable climates. In warmer areas, Red-tailed Hawks are usually resident in their breeding territory.<sup>79</sup> In B.C., Red-tailed Hawks move north between February and May. The autumn migration starts in August and ends in October.

## Habitat

Red-tailed Hawks use many types of habitat. They prefer habitat containing open areas with hunting perches.<sup>80</sup> They occur from sea level to alpine areas in B.C. Occurring throughout the province in nearly every habitat makes it difficult to describe habitat preferences for this species. Nevertheless, Red-tailed Hawks are seen more often in some types of habitat than others. Breeding density is greatest where there is a good supply of small mammals for food. Coastal areas including Haida Gwaii, Vancouver Island and the Coast Ranges do not have as many hawks as interior areas probably for this reason. On Vancouver Island, they are seen most often seen in areas of mixed woodland and open habitat. This includes areas of clearcut close to forested land, subalpine forest near alpine meadows, estuaries with nearby woods, and agricultural areas with forest in and near them. In southwestern B.C., they frequently occur in urban areas that have parks nearby to provide nesting trees. Many Red-tailed Hawks nest and winter in the Fraser Lowlands. The mix of woodlot, hedgerow, agricultural field, and old-fields with abundant rodent prey provide prime habitat at all times of the year. In winter, those that breed in the Fraser Lowlands are joined by birds from other areas. They are often seen along the highways and other roads perched on streetlight poles, telephone poles, communication towers, fence posts and trees. In the interior, they inhabit all areas and habitats with available prey and nesting trees.

<sup>77</sup> Preston and Beane 1993

<sup>78</sup> Preston and Beane 1993

<sup>79</sup> Preston and Beane 1993

<sup>80</sup> Preston and Beane 1993





## Breeding

Red-tailed Hawks usually build their large stick nests in trees or more rarely on cliffs or other sites. Trees selected are generally taller than other nearby trees, often high on a slope with a wide view from the nest. The clutch is usually of 2–3 eggs, which are incubated for 28–35 days. Eggs are laid at about two day intervals; incubation begins after the first egg is laid, resulting in uneven aged chicks. Chicks leave the nests when about 6–7 weeks after hatching but stay in the vicinity, remaining dependent on the parents for food for another 6–8 weeks or more.<sup>81</sup>

## Food Habits

Red-tailed Hawks do most of their hunting from perches with good views of prey habitat. Less often-used hunting methods are soaring or flapping-and-gliding flight while searching for prey.<sup>82</sup>

Red-tailed Hawks capture a wide variety of prey including insects, birds, reptiles and mammals up to the size of waterfowl or large rabbits and hares. Small mammals often form the bulk of their diet, although their diet can vary greatly depending on the availability of prey. Carrion is also eaten.<sup>83</sup>

## Compatibility with Human Landscapes

Red-tailed Hawks are compatible with several different urban environments that support populations of rodents such as voles. Red-tailed Hawks can coexist with humans in the rural environment if they have open grassy or shrubby areas to hunt in, large trees to nest in, and are not subject to disturbance at the nest. Red-tailed Hawks are beneficial to landowners as they reduce small mammal populations. As with all raptors, nesting Red-tailed Hawks are very wary during nest construction, and will often abandon the nest during this period if disturbed.

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81 Preston and Beane 1993

82 Preston and Beane 1993

83 Preston and Beane 1993



## 10.10 Golden Eagle (*Aquila chrysaetos*)



Photo: ©Stuart Clarke

Identification (Length 70–102 cm; Wingspan 185–224 cm)

- Very large dark eagle in the Order *Accipitriformes*.
- Adults: overall dark brown except tawny nape and back of head and faint paler tail bands. The eyes and bill are dark.
- Immatures: similar to adults but with white patches at base of primaries and white tail with broad dark band across the end.
- Females appear similar to males but are larger.
- Soars frequently, often with slightly uplifted wings, sometimes to great heights. Level flight is strong and steady.
- Can be confused with Bald Eagles, which have relatively larger heads and shorter tails. This is especially true for first year Bald Eagles and adult Golden Eagles both of which are mostly dark all over. The white areas on two-year old immature Bald Eagles are usually irregularly placed throughout all body surfaces, gradually concentrating in the head and tail area as they mature. Immature Golden Eagles also show definitive white patches, but these are concentrated at the base of primaries and tail. The Turkey Vulture is nearly as large as the Golden Eagle; see Turkey Vulture account for field marks.

Golden Eagle status

COSEWIC: Not at Risk  
B.C. status: Yellow-listed

[Sample vocalizations](#)

### Distribution

World-wide range includes much of Europe, Asia, North Africa, and western North America. Golden Eagles breed throughout much of B.C., except on Haida Gwaii. During migration they can occur anywhere in the province. Wintering birds are common—mainly south of Prince George, in the Fraser Lowlands, and eastern Vancouver Island.<sup>84</sup>

84 Campbell et al. 1990; Kochert et al. 2002



## Population Status

The Golden Eagle is not a species at risk, although populations in some areas are declining. Kirk and Hyslop (1998) estimated between 2,000 and 10,000 breeding pairs in Canada.

## Movements

Although it occurs throughout B.C. during migration, not much is known about the migratory routes and behaviour of Golden Eagles in the province. Large numbers of southbound migrants have been counted in recent years on the eastern slopes of the Rocky Mountains in Alberta, not far from B.C. Possibly most of the birds from northwestern North America migrate along that route. In B.C., birds are not known to concentrate in the same way and are recorded, usually as individuals or pairs. Fall migration in B.C. consists of low numbers of birds during September and October. Spring migration occurs across B.C. during March and April, also involving low numbers.

## Habitat

In B.C., the Golden Eagle is mostly a bird of the mountains, however recently a few have been seen on nests on coastal cliffs around the Gulf Islands. Unlike the Bald Eagle, Golden Eagles are not normally seen on coastal beaches, or at estuaries and rivers feeding on dead salmon. Some Golden Eagles in B.C. breed close to human populations, although their large stick nests are usually in inaccessible locations such as cliff ledges. In the Okanagan Valley a few nests are close to the valley bottom in sight of the highway. Golden Eagles occasionally nest in large trees in forested areas close to foraging habitat. Foraging habitat is open areas of many types including alpine meadows, rangelands, and agricultural fields. Although occasionally seen soaring over urban areas during migration, the Golden Eagle is not known to use urban areas in the province regularly. In some areas of mixed agriculture and residential land use such as the Fraser Lowlands and southeast Vancouver Island this eagle may be seen during winter perched on powerline towers, telephone poles, or a similar elevated structure.

## Breeding

A variety of nest sites have been used in North America including cliffs, riverbanks, the ground, trees, human-made structures and nest platforms.<sup>85</sup> In B.C., the most frequent type of nest site is on cliffs, or other steep rocky ground in mountainous areas. However, on and around Vancouver Island, the few nest sites found to-date have either been in large trees or on low-level ocean cliffs. Regardless of the nest site, nests are massive compositions of branches and sticks built with a nest cup lined with moss, grasses, and green conifer boughs. Nests are constructed or added to mainly during March and may be used repeatedly for many years. Most nests are less than 1 m in depth, but nests built in vertical crevices that have been added to over many years can attain depths of several metres. Golden Eagles usually build one or more

85 Kochert et al. 2002



alternate nests in their territories. One to three eggs are laid at 3–5 day intervals and incubated for about 45 days. Young eagles leave the nest as young as 45 days old, but the average is about 65 days. The young stay with the parents for several weeks to several months with fledglings starting to attempt prey capture 1–3 months after fledging.<sup>86</sup>

### **Food Habits**

Golden Eagles look for prey while soaring high above the ground, flying fast and low to the ground, or perching on a structure. Many strategies are used; the one chosen at a given time depends on the weather, the landscape, and the type of prey available. Soaring flight is used most often during sunny and windy days, presumably using air currents as an aid to flight.

Small- and medium-sized mammals are the primary food of Golden Eagles. Numerous species of mammal have been recorded in their diet. Rabbits, hares, and ground squirrels are the most important type of mammalian prey for this eagle. Introduction and expansion of alien invasive rabbit and squirrel species on southern Vancouver Island are likely responsible for the recent increase in Golden Eagles breeding in the area. Golden Eagles also forage for carrion including roadkill, especially during the winter. Both Golden Eagles and Bald Eagles feed on stillborn offspring and placentas of cows and sheep in ranching country, and they can be subject to control by landowners who mistakenly presume they are killing their livestock. Prey is spotted while the eagle is soaring high above the ground; carrion is located by watching the behaviour of Common Ravens and other scavengers.

### **Compatibility with Human Landscapes**

This species is not known to occur in urban environments, but does breed in semi-developed rural areas such as the Gulf Islands and large parks around Victoria, as well as mountains/cliffs near ranch lands in the interior. Nests are usually remote and not subject to disturbance, though rock climbing and commercial activities close to nest cliffs could present issues at local sites. Conflicts can occur in ranch lands where the species can be viewed as a potential predator on livestock; however, most cases of Golden Eagles feeding on domestic animals involve them feeding on carrion or afterbirth.

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86 Campbell et al. 1990; Kochert et al. 2002



### 10.11. American Kestrel (*Falco sparverius*)



Photo: ©Stuart Clarke

Identification (Length 22–27 cm; Wingspan 52–61 cm)

- Classified as a raptor in the Order *Falconiformes*
- Small falcon with long pointed wings; frequently bobs tail when perched.
- Adults: Males have blue-gray and rufous on crown and a white face marked by two narrow black vertical bars. The back is rufous with dark bars on lower half. Folded wing looks blue-grey. Underparts are pale rufous with sparse small black spots. Tail rufous with black band at tip.
- Females: Similar to males but browner upperparts with barring on entire back. Blue-grey on upperwings is replaced by brown with dark brown barring. Underparts streaked. Tail brown with narrow dark brown bands. Females are slightly larger than males.
- Immatures: Males are like adult males but heavily streaked on the breast and completely barred above. Immature females are much like adult females.
- Level flight is usually somewhat fluttery though strong and direct in higher winds. Often hovers when hunting and during courtship displays. Soars with wings flat.
- Similar in size to, but flight is not as powerful as the Merlin. Merlin has no rufous feathers.

#### Distribution

The American Kestrel is widely distributed in North and South America. In North America they are absent as a breeder only from tundra and northwest coastal regions. Most birds winter well south of Canada: they are rare during winter in extreme southern Canada. The American Kestrel breeds throughout B.C., except

American Kestrel status

COSEWIC: Not Listed

B.C. status: Yellow-listed

[Sample vocalizations](#)

©Naturesongs





Haida Gwaii. Small numbers breed in the Fraser Lowlands and on Vancouver Island. They are common breeders in many parts of the interior. Migrating birds may be seen anywhere in the province. During the winter, small numbers remain on southern Vancouver Island, the Fraser Lowlands, and in the some interior valleys including the Okanagan and Thompson.<sup>87</sup>

### Population Status

The American Kestrel is not a species at risk. The total population, estimated in 1982, was about 2.5 million pairs, split about equally between North and South America.<sup>88</sup> The population of this species fluctuates rapidly in response to habitat changes. The population increases when forest is converted to more patchy or open habitats which maintain snags for nesting. Subsequent conversion of these agricultural and rural areas to residential and industrial developments causes a decrease in the local kestrel population.

### Movements

Early spring migrants move into B.C. during early March, the peak passage is in April. The vast majority have left the province by mid-October.

### Habitat

American Kestrels use a variety of open habitats at all times of the year. In general, prime foraging habitat is open areas with low open vegetation and suitable hunting perches. When they are in more heavily forested areas, foraging is done in openings.<sup>89</sup> In some areas of North America, good foraging habitat exists but there is a lack of nesting cavities. Provision of nest boxes has allowed kestrels to use these areas.

During the breeding season, preferred habitat in B.C. includes many types of open and partially open areas. Breeding birds are often seen perched on power-lines and fence posts along roads.

In migration, American Kestrels often fly over unsuitable foraging habitat stopping to hunt when good habitat is encountered. At this time they may be seen nearly anywhere in the province including urban areas.

During the winter in B.C., American Kestrels are often associated with human developments including airports, residential areas, orchards and agricultural fields.<sup>90</sup>

87 Campbell et al. 1990

88 Smallwood and Bird 2002

89 Smallwood and Bird 2002

90 Cannings et al. 1987



## Breeding

Cavities formed by woodpeckers or some other means in living or dead trees are the most important nesting sites for American Kestrels. A variety of other sites have been reported in B.C. including holes in cliffs, old nests of other birds, holes in the walls of abandoned buildings, and nest boxes.<sup>91</sup> In Vernon, a pair nested successfully in a hole in a tree on a busy downtown street.<sup>92</sup> The usual clutch is 4–5 eggs, laid at two day intervals. Eggs may be laid during early April in the south; into late June in the north. The incubation period is about 30 days. The young leave the nest when they are about one month old and depend on the parents for food for about another two weeks.<sup>93</sup>

## Food Habits

Much of the time American Kestrels search for prey by perching on elevated sites such as telephone poles and wires, trees, buildings, and communication towers. Where there is no suitable perch, kestrels will hover. Kestrels hover about 10–20 m above the ground, by facing into the wind and, with alternating bouts of flapping and gliding, stay stationary over the ground while scanning for prey. Large insects and small rodents are the main prey, but amphibians, reptiles, and birds are also taken.

## Compatibility with Human Landscapes

American Kestrels eat many small prey animals that occur in urban and rural areas. Large insects such as dragonflies and grasshoppers, and small rodents such as voles and mice, make up much of their diet. Like most raptors, kestrels will take advantage of any food source. Other prey species in their diet include but are not limited to many types of small birds, reptiles, and amphibians. Human-related mortality is the most commonly reported cause of death for this species. Collisions with wires, vehicles and windows, electrocution, drowning in tanks and pools, and attacks by domestic pets are commonly reported. Removal of young and eggs by snakes, crows and mammals occur; other raptors are known to kill adults. While known to have been affected by pesticide contamination, American Kestrels may be affected more by reduced numbers of insect prey following pesticide applications.

91 Cannings et al. 1987; Smallwood and Bird 2002

92 Cannings et al. 1987

93 Smallwood and Bird 2002; Campbell et al. 1990)



### 10.12. Merlin (*Falco columbarius*)



Photo: ©Stuart Clarke

Identification (Length 24–31cm; Wingspan 53–68cm)

- Classified as a raptor in the Order *Falconiformes*
- Small, typical falcon-shape (cylindrical body, thick-chested and tapered behind, tapered pointed wings).
- Three subspecies in B.C., differing physically mainly in colour tone and extent of darker areas of plumage. Intermediate forms also occur. Breeding range and migratory patterns also different.
- Adults: In males the side of head is pale grey to blackish; pale birds have a light line over the eye. Throat whitish. Crown, back and upper wings and tail range from blue-gray to nearly black. Underside of wings checkered with dark and light. Underparts on pale birds are moderately streaked rufous or brown; dark birds more heavily streaked grey-black. Dark tail usually shows three narrow greyish bands and a grey tip.
- In females the black and blue-grey tones of the male are brown.
- Juveniles: Similar to adult female.
- Powerful flight is fast and steady with continuous wingbeats. Also soars while holding wings flat. Does not hover.
- Merlins are about the same size as American Kestrel but are more heavily built with much more powerful flight. Merlins have no rusty tones on upperparts or tail. Peregrine Falcon and Prairie Falcon are much larger with longer wings. Sharp-shinned Hawk is similar in size but very different in shape with a long tail, broad rounded wings.

[Merlin status](#)

COSEWIC: Not at Risk  
B.C. status: Yellow-listed

[Sample vocalizations](#)



## Distribution

Merlins breed around the world in north temperate regions. In North America they breed throughout Canada and Alaska, south of the treeline and in some northwest states. North American Merlins winter in coastal areas of B.C. and Alaska, as well as many western states and throughout Mexico and Central America to northern South America.<sup>94</sup>

## Population Status

Globally, the Merlin is not a species at risk. Its populations have been expanding in parts of North America as Merlins have started using urban centres.<sup>95</sup>

## Movements

Merlins that breed in coastal B.C. are a subspecies known as Black Merlins (*F. c. suckleyi*). Most Black Merlins are non-migratory although some move south as far as southern California for winter. The Taiga Merlin (*F. c. columbarius*) is a lighter colour race that breeds in northeastern B.C. and winters from the western United States to South America. Palest of the three North American races, the Prairie Merlin (*F. c. richardsonii*) is not known to breed in B.C. Prairie Merlins rarely occur in B.C. and mostly during migration. Some Prairie Merlins spend the winter in northern parts of their range; others move south as far as Central America.<sup>96</sup> Spring migration is during April and May; fall migration is between August and November.

## Habitat

Merlins breed in coniferous or deciduous forest habitats with nearby open areas. Nest sites are often near water. Merlins are frequently seen in urban and rural areas. In B.C., they hunt in clearcuts, agricultural fields, grasslands, subalpine meadows, and wetlands.<sup>97</sup> Wintering birds along the coast are frequently seen at estuaries, shorelines, wetlands, agricultural fields and urban and rural areas.

## Breeding

Merlins do not build their own nest—they use old nests in trees of other birds such as crows or magpies. Rarely, other sites are used including cliff ledges. They usually lay 3–5 eggs between April and July. Eggs are laid at two day intervals and are incubated for about 30 days. The young stay in the nest for about 30 days after hatching. Parents and young stay together in the vicinity of the nest for up to another month before the young disperse.<sup>98</sup>

94 Sodhi et al. 1993

95 Sodhi et al. 1993

96 Campbell et al. 1990; Sodhi et al. 1993)

97 Campbell et al. 1990

98 Sodhi et al. 1993



## Food Habits

Merlins do much of their hunting by perching in a tree or other vertical structure with a wide view of open ground. When prey is spotted the Merlin flies rapidly to it usually grabbing it in the air. Their diet is mainly of small birds. Insects (e.g., dragonflies), reptiles and small mammals can also be important, depending on local availability.<sup>99</sup>

## Compatibility with Human Landscapes

In other parts of its range, including the B.C. interior, Merlins have become well adapted to urban environments.<sup>100</sup> The availability of nesting sites and the abundance of songbird prey probably draws this species into urban areas. Merlins are able to adapt well to breeding in wooded areas of urban/rural environments.

### 10.13. Peregrine Falcon (*Falco peregrinus*)



Photo: ©Stuart Clarke

Identification (Length 37–46 cm; Wingspan 94–116 cm)

- Classified as a raptor in the Order *Falconiformes*
- Medium to large-sized, long-winged falcon
- Three subspecies in B.C., differing mainly in colour tone and extent of dark feathers.
- Adults: Head mostly dark with pale throat and cheeks creating a distinctive wide dark moustache mark on side of face. Upperparts dark blue-gray to blackish. Underside of body light, lightly to heavily spotted and barred. Tail dark with narrow greyish bands.

99 Sodhi et al. 1993

100 Warkentin and James 1988





- Immatures: Like adult except brownish above and streaked below
- Females are larger than males.
- Powerful level flight. Frequently soars with wings flat. Often stoops from great height.
- Very similar in size and shape to Prairie Falcon. Peregrine is darker overall with grey, black, and blue-gray tones, Prairie is much paler with buff-brown tones. Distinctive in Prairie Falcon is the dark areas at the base of the underside of the wings. Underside of wings in Peregrine is uniformly coloured. Dark morph Gyrfalcons can be difficult to separate from immature Peregrine Falcons. Gyrfalcons have relatively broader wings, a heavier build and less extensive moustache. Merlin similar in build and flight but much smaller and lacks wide moustache mark.

#### Peregrine Falcon status

*F. p. anatum*  
COSEWIC: Special  
Concern  
B.C. status: Red-listed

*F. p. pealei*  
COSEWIC: Special  
Concern  
B.C. status: Blue-listed

*F. p. tundrius*  
COSEWIC: Special  
Concern  
B.C. status: unknown

### Distribution

The Peregrine Falcon is distributed nearly worldwide. In North America, it nests from the low Arctic to Central America. Distribution is very patchy especially in eastern North America.<sup>101</sup> Populations of breeding birds are known from several parts of B.C., notably the entire coast, the Fraser Canyon, and the Southern Interior of B.C.<sup>102</sup> The interior *F. p. anatum* population appears to be recovering and expanding its range; breeding was confirmed in the Kootenays in 2010 and potentially the species could breed anywhere in the province that suitable cliffs occur in proximity to water.

### Population Status

The *anatum* subspecies of the Peregrine Falcon is listed as “Special Concern” nationally and Red-listed in B.C.; the *pealei* and *tundrius* subspecies are also listed as “Special Concern”, but *pealei* is Blue-listed provincially while *tundrius* is designated as “unknown”. Several of the world’s 19 subspecies, including two of North America’s three subspecies (*F. p. anatum* and *F. p. tundrius*), have suffered from past population declines. Major declines in North America during the mid-1900s were traced to high levels of pesticides in the food chain, resulting in greatly diminished breeding success. The ban of many of the worst chemicals, coupled with intense conservation measures has resulted in a recovering population over much of its range. An estimated 12,000-15,000 pairs of Peregrine Falcons breed in North America.<sup>103</sup> Nonetheless, all three subspecies in B.C. are considered to be provincially and nationally at risk. *F. p. anatum* is the most at risk with about 35 breeding pairs known in the province, mostly around the extreme southwest coast though the 2010 surveys showed increases in the interior. *F. p. pealei* has been stable for several decades in B.C. with around 120 known breeding pairs occurring mostly on Haida Gwaii, north and western Vancouver Island, and other offshore islands. *F. p. tundrius* does not breed in B.C. and is only recorded here as an occasional migrant.

#### [Sample vocalizations](#)

101 White et al. 2002  
102 Campbell et al. 1990  
103 White et al. 2002



## Movements

The three subspecies of Peregrine Falcon that occur in B.C. vary in size, colour tone and extent of dark areas. They also have different migration strategies and breed in different geographic areas. The Peale's Peregrine Falcon (*F. p. pealei*), the largest and darkest race, lives in coastal areas and is mostly sedentary with short- and medium-distance migrations southward along the Pacific coast. The smaller and next palest subspecies, the American Peregrine Falcon (*F. p. anatum*), ranges throughout the interior of the continent south of the tundra. It is a medium- to long-distance migrant with some individuals moving to South America. The palest of North America's races is the Tundra Peregrine, (*F. p. tundrius*) also a long-distance migrant, with some birds moving as far as southernmost South America.<sup>104</sup> There is much variation in the distance travelled by individual birds of the various populations. The 2007 COSEWIC status report considered *F. p. anatum* and *F. p. tundrius* to be a single designatable unit as they could not be distinguished genetically.

## Habitat

In general, prime habitat at all times of the year for Peregrine Falcon includes open areas with an abundance of prey usually close to the sea coast or interior lakes and rivers. Preferred breeding habitat nearly always contains a prominent cliff that serves as a nesting location and perch sites with a wide view of the surrounding area.

Foraging occurs in open areas, including all coastal shoreline habitats, especially estuaries, tidal marshes, mudflats, and open nearshore waters. An abundance of suitable prey and landscape features that enable successful prey capture are the most important factors for good hunting habitat. During the winter, Peregrine Falcons take up residence in a suitable area but may range widely in search of food. An abundance of shorebirds, waterfowl, or Rock Doves (*Columba livia*) is enough for habitat to be suitable for wintering Peregrine Falcons. Night roost sites during winter are important and Peregrine Falcons will fly up to 24 km between foraging areas and a night roost. A variety of roost sites have been reported in Washington, including coniferous trees, cliffs and bluffs and human-made structures like buildings, towers and bridges.<sup>105</sup>

## Breeding

Most Peregrine Falcons that breed in B.C. nest on ledges on cliffs or other steep locations such as rocky bluffs, and steep banks. Larger cliffs are probably favoured over smaller ones because of the better view of the landscape and of potential hunting opportunities.<sup>106</sup> Nesting cliffs may have a vertical height of less than 7 m to more than 100 m. Some pairs use stick nests constructed by other species (usually on cliffs). Peregrines nest on some human-made sites such as high-rise buildings and bridges in urban landscapes, and highway cut banks and quarries in rural areas. These sites are in areas of much human disturbance.<sup>107</sup> A few Peregrine Falcons nest in

104 White et al. 2002

105 Hayes and Buchanan 2002

106 Hayes and Buchanan 2002

107 Ritchie et al. 1998



trees in B.C. Six nests were located in trees on offshore islands near seabird colonies; four of the six were in old Bald Eagle nests.<sup>108</sup> Many coastal nest sites are close to seabird colonies. Peregrine Falcons, like all other falcons, do not build nests. A shallow depression on a cliff ledge or the old nest bowl in another species old nest is sufficient to hold the eggs and developing chicks. The nest site may be enhanced by a shallow scraped out spot made by the adults prior to egg-laying. Usually 3–4 eggs are laid with 2–3 days between eggs. The eggs are incubated for about 33–37 days. The young leave the nest about six weeks after hatching though the family stays together; adults feed the young for several more weeks, until the young are independent.

### Food Habits

Peregrine Falcons locate potential prey from the air or an elevated perch. They capture their smaller prey (birds) in the air, and knock larger prey down to ground after striking them with their feet at the end of a stoop. In spite of the speed that peregrines are able to reach, many other smaller species are more manoeuvrable and peregrines often fail in their capture attempts. Often peregrines attempt to surprise their prey by flying low over the ground or water keeping some higher landscape feature between them and their prey until, at the last possible moment, they move over or around the feature and attack the prey. They also steal prey from other raptors including fish from Ospreys and mice from Red-tailed Hawks.<sup>109</sup>

Peregrine Falcons feed almost exclusively on birds. Many species of birds have been recorded in the Peregrine Falcons diet from small shorebirds and songbirds, to waterfowl up the size of geese. Occasionally small mammals are taken and rarely, fish, amphibians and insects.<sup>110</sup>

### Compatibility with Human Landscapes

Threats to peregrines in interior B.C. have been attributed to the loss of wetland foraging habitats to urban and agricultural development as well as continued exposure to organochloride pesticides and other toxic chemicals.<sup>111</sup> Although cliff-nesting habitat is secure in B.C., development of hillsides below nesting cliffs or recreational use of cliffs may be a problem for Peregrine Falcons that are sensitive to repeated human disturbance at nest sites. Outside of B.C., Peregrine Falcons have adapted to urban areas where high-rise buildings provide nesting and perching habitat and there is an abundance of prey such as Rock Pigeons.<sup>112</sup> Within B.C., there are several records of peregrines nesting on major bridges in the Greater Vancouver area and a few records of single birds perching on and hunting around Vancouver high-rises. To date, however, none have been known to nest on these buildings.

108 Campbell et al. 1978; Campbell et al. 1990

109 White et al. 2002

110 White et al. 2002

111 Wilson et al. 1996

112 Cade et al. 1996



#### 10.14. Prairie Falcon (*Falco mexicanus*)



Photo: Mike Yip

Identification (Length 37–47 cm; Wingspan 93–113 cm)

- Classified as a raptor in the Order *Falconiformes*, the Prairie Falcon is a medium-large falcon similar in size and shape to the Peregrine Falcon.
- Upperparts are pale brown. The underparts are whitish with dark spots.
- A distinctive feature, visible in flight from below is the dark patch on the inner wing (in the “armpit”). The overall colour is much paler than in Peregrine Falcon.

Prairie Falcon status

COSEWIC: Not at Risk  
B.C. status: Red-listed

#### Distribution and Status

The species is scarce during the breeding season in the southern interior of the province, north to about Williams Lake. There are breeding records from near Williams Lake and in the Okanagan, Nicola, and Thompson valleys; however, recent surveys show many of these sites to be either empty or taken over by peregrines and there is serious concern that the species may soon be extirpated as a breeding species in the province. On the positive side, the BC Breeding Bird Atlas has recently reported confirmed breeding in the Kootenays along the B.C./Alberta border as well as a sight record north of Prince George during the breeding season.<sup>113</sup> Occasionally, an individual is observed wintering in the Lower Mainland. The origin of the wintering birds on the coast is uncertain.

[Sample vocalizations](#)

#### Habitat

This species occurs mainly in open areas of grassland and sagebrush, and during the breeding season, near suitable nesting cliffs. During the winter, they occur in rural and urban areas attracted by the abundant source of birds as prey at bird feeders and livestock operations.<sup>114</sup> They nest on cliffs or other very steep sites.

113 BC Breeding Bird Atlas 2012: <http://www.birdatlas.bc.ca/bcddata/maps.jsp>

114 Fraser et al. 1999



## Food Habits

Throughout much of its range the Prairie Falcon feeds mainly on ground-squirrels.<sup>115</sup> In B.C., many species of small mammals and birds are taken. Small mammals include chipmunks, mice, Red Squirrels, ground-squirrels, marmots and a wide variety of small birds up to the size of Mallard (*Anas platyrhynchos*).<sup>116</sup>

## Compatibility with Human Landscapes

Prairie Falcons nest on fairly remote cliffs in open habitats away from urban environments, but regularly use urban and rural areas during the winter.

### 10.15. Barn Owl (*Tyto alba*)



Photo: ©Stuart Clarke

Identification (Length 41 cm; Wingspan 107 cm)

- Classified as a raptor in the Order *Strigiformes*.
- Medium-sized pale-coloured owl with broad but fairly pointed wings.
- Adults: Whitish heart-shaped face with dark eyes, no ear tufts. Golden-brown upperparts are variably spotted with grey. Underparts range from white to buff and are speckled with black spots. Underside of the wings looks white to cinnamon.
- Immatures: Like adults after first couple of months.
- Females are larger and typically darker than males.
- When hunting, flies with much banking and turning.
- Looks ghostly white in headlights or streetlights. Heart-shaped face unique among

Barn Owl status

COSEWIC: Special Concern

B.C. status: Blue-listed

[Sample vocalizations](#)

<sup>115</sup> Steenhof 1998

<sup>116</sup> Hooper 1997





B.C. owls. Combination of pale colour and rusty-brown colours unique. Snowy Owl is much larger, has yellow eyes and lacks rusty tones. Short-eared Owl has yellow eyes, is streaked on breast, and has relatively longer wings. Downy juveniles of other owls (e.g., Great Horned Owl, Barred Owl) are sometimes mistaken for Barn Owls as they are whitish in colour, lack ear tufts and give harsh calls. The shape of the facial discs should differentiate the young of these other species from Barn Owls.

## Distribution

Barn Owls are distributed nearly worldwide. In Canada, Barn Owls breed only in southwestern Ontario (very low numbers) and southern B.C. In B.C., Barn Owls breed throughout the Fraser Lowlands, and locally in the Okanagan and on Vancouver Island. There are individual non-breeding records from Creston, Trail and Valemount in the Kootenays, and Ft. St. John and Kitimat in northern B.C.<sup>117</sup>

## Population Status

The Barn Owl is a fairly relatively recent arrival in B.C., the first record occurring in 1909.<sup>118</sup> The clearing of the forest and development of large agricultural areas probably made it possible for Barn Owls to live in the region.<sup>119</sup> Barn Owl populations have declined in several parts of their range and the species is on Species at Risk lists in several western states. In B.C., Barn Owls are only common in the Lower Mainland. On Vancouver Island and southern interior areas the Barn Owl is rare. It nests in very low numbers and at very low densities. The population of Barn Owls in B.C. is about 1,000 individuals.<sup>120</sup>

## Movements

Barn Owls are non-migratory and largely resident in B.C. Young birds disperse from their parents nesting territory during the fall and may show up as vagrants far from their normal range.

## Habitat

Barn Owls hunt in open areas including but not limited to agricultural fields, marshes, and urban areas. In B.C., they are associated with low elevation agricultural areas of the Fraser Lowlands. During the nonbreeding season, Barn Owls often roost in the same location that is used for nesting.<sup>121</sup> Only nine of the 236 sites used for nesting or roosting that were found during a study in the Lower Mainland were not in human-made sites.<sup>122</sup>

117 Birds of British Columbia, Breeding Bird Atlas and e-bird Canada

118 Campbell et al. 1990

119 Andrusiak and Cheng 1997

120 Andrusiak and Cheng 1997

121 Andrusiak and Cheng 1997

122 Andrusiak and Cheng 1997



## Breeding

Barn Owls use many types of nesting sites. Natural sites include cavities in trees, cracks in cliffs, and old nests of other birds. Barn Owls also use human-made structures, particularly barns (hence their name), attics, grain silos, church steeples, and nest boxes.<sup>123</sup> Human-made nesting sites provide shelter from the weather and protection from predators.<sup>124</sup> They do not build a nest, although the eggs are usually laid on a layer of regurgitated pellets. The usual breeding period for Barn Owls in B.C. is early March to May. They may breed at other times in response to an abundance of prey. The clutch size is highly variable but 3–6 eggs is the norm in B.C., laid at 2–3 day intervals. Incubation of about 29–34 days is performed by the female while the male provides her with food. It takes the young up to two months to become independent and they may roost near the nest for up to two months more.

## Food Habits

Nearly all hunting Barn Owls fly low over open habitats making sharp banks and sudden changes in direction as they try to locate prey. Occasionally they search for prey from a perch. Barn Owls are capable of capturing prey in total darkness, using only their incredibly sensitive, directional hearing to locate the animal.

Barn Owls hunt for small mammals that are active at night such as voles, mice, and shrews. The most important prey species in southwestern B.C. is the Townsend's Vole (*Microtus townsendii*). The rest of the diet is largely other small mammals. Birds are also eaten in lesser amounts.

## Compatibility with Human Landscapes

The presence of the Barn Owl in B.C. is primarily a result of human activities that have produced suitable nesting and roosting habitats (barns and other buildings) and suitable foraging areas (e.g., agricultural areas). Fragmentation and development of such habitats may result in population declines. Loss of nest and roosting sites, particularly the removal of derelict farm buildings, and the decline of agricultural lands that support high densities of small mammals may also limit populations. Areas of old-fields and hedgerows, which provide preferred foraging habitat for this species in agricultural areas, are gradually disappearing in urban and rural areas of B.C. Voles (important prey for Barn Owls) are also susceptible to large population fluctuations in fragmented landscapes. Barn Owls can provide a major benefit to farmers by controlling small mammal populations that depredate their crops. The institution of nest box programs may help to alleviate the problems of the potential decline of suitable nesting and roosting habitat. Causes of mortality in B.C. include collisions with vehicles, starvation, nestling mortality, and predation by Great Horned Owls.

<sup>123</sup> Marti 1992

<sup>124</sup> Andrusiak and Chang 1997



## 10.16. Flammulated Owl (*Otus flammeolus*)



Photo: ©Jared Hobbs

Identification (Length 15–17 cm; Wingspan 40 cm)

Classified as a raptor in the Order *Strigiformes*, the Flammulated Owl is a very small brownish owl with dark eyes and small ear tufts. It is similar to the somewhat larger Western Screech-Owl except it has dark eyes and shorter ear tufts.

### Distribution and Status

In B.C., Flammulated Owls occur from the US border in the Southern Interior north to Williams Lake, west to Lillooet and east to Kamloops; it is also found in the Kootenay Trench.<sup>125</sup>

Flammulated Owl status

COSEWIC: Special  
Concern  
B.C. status: Blue-listed

### Movements

Flammulated Owls are highly migratory and normally occur in B.C. only between May and October.

[Sample vocalizations](#)

### Habitat and Breeding

Breeding habitat in B.C. is in the Interior Douglas-fir Biogeoclimatic Zone. Open forests of mature or old-growth Douglas-fir mixed with Ponderosa Pine and shrubby thickets are preferred in B.C. It nests in a cavity in a tree. It has used nest boxes in B.C. and other areas. They most often use nest cavities made by Northern Flickers and Pileated Woodpeckers.<sup>126</sup>

### Food Habits

Flammulated Owls locate prey at night while perched and fly to capture it. They capture prey in the air, on the ground or on branches by hovering. The diet is almost entirely insects especially moths and beetles.<sup>127</sup>

<sup>125</sup> van Woudenburg 1999

<sup>126</sup> Cannings and van Woudenburg 2004

<sup>127</sup> McCallum 1994



### Compatibility with Human Landscapes

In the southern interior valleys of B.C. they may occur close to urban and rural areas, provided mature woodlands and riparian habitats with large trees are nearby.

### 10.17. Western Screech-Owl (*Megascops kennicottii*)



Photo Dan Lockshaw

Identification (Length 22 cm; Wingspan 50 cm)

- Classified as a raptor in the Order *Strigiformes*.
- Small owl with short tail and rounded wings.
- Two subspecies in B.C. differing mainly in colour and distribution.
- Most coastal birds are browner and about 10% are much redder than the greyish interior birds.
- Adults: Generally grey or brown overall with streaks on the underparts and much barring and other marking on the upperparts and wings. Facial disc well-defined. Ear tufts are present, but are often not visible. The eyes are yellow and the bill is black.
- Immatures: Like adults after first couple of months.
- Flammulated Owl is smaller and has dark eyes and different call.

Western Screech-Owl  
status

*M. k. kennicottii*  
COSEWIC: Threatened  
B.C. status: Blue-listed

*M. k. macfarlanei*  
COSEWIC: Threatened  
B.C. status: Red-listed

[Sample vocalizations](#)

### Distribution

The Western Screech-Owl occurs from south-coastal Alaska to central Mexico. In B.C., two subspecies occur. The race *M. k. kennicottii* occurs the length of B.C. in coastal regions except Haida Gwaii. The race *M. k. macfarlanei* occurs in the south interior. It is sometimes considered to be part of a more widespread race known as *M. k.*



*bendirei*. This race has a small population in B.C. that was originally thought to be limited to the Okanagan Valley; however, recent surveys have expanded the breadth of its confirmed breeding locations from Lillooet to the Kootenays.<sup>128</sup>

### Population Status

There are conservation concerns regarding the Western Screech-Owl in B.C. The Interior subspecies, *M. k. macfarlanei*, is designated as Threatened nationally and Red-listed in B.C., while the coastal race, *M.k. kennicottii*, is also designated Threatened nationally but is Blue-listed provincially. A severe loss and degradation of riparian habitats is the main reason for the decline of Western Screech-Owls in the Okanagan and Similkameen Valleys.<sup>129</sup> Local declines have occurred in coastal areas including Vancouver, Victoria and Salt Spring Island. The Western Screech-Owl appears to be undergoing a range withdrawal on southern Vancouver Island.<sup>130</sup> The reason for the coastal declines is undetermined but loss of nesting and roosting habitat, and predation by Barred Owls, are identified as ongoing threats. The abundance of Barred Owls greatly increased in these areas during the same period as the Western Screech-Owl populations declined. The Great Horned Owl population also increased near Victoria during the same period.<sup>131</sup>

See the fact sheet on Western Screech-owls at <http://www.env.gov.bc.ca/wld/documents/bmp/devwithcare2012/Fact-Sheet-12-screech-owl.pdf>

### Movements

Western Screech-Owls do not migrate; pairs are resident on their territory all year. During late summer, young owls leave their parents' nesting territory and look for their own territory. Juvenile dispersal is generally a very short distance of less than 20 km.<sup>132</sup>

### Habitat

Western Screech-Owls occupy many types of habitat throughout their large range though are often associated with riparian habitats and deciduous trees. In B.C., coastal birds (*M. k. kennicottii*) use lower elevation habitats including a variety of woodlands, city parks and rural areas. In general, their preferred habitat is lowland forests with a mix of deciduous and coniferous trees near water. At Point Grey in Vancouver, Western Screech-Owls territories were in mixed woodlands with ravines containing large Big-leaf Maples. On Vancouver Island, mature mixed forest with openings and nearby water is the preferred general habitat. Old-growth habitats are also prime habitats for Western Screech-Owls on Vancouver Island.

Interior birds are restricted to lower elevations of southern valleys where they are strongly associated with mature riparian woodlands dominated by Water Birch (*Betula occidentalis*), Black Cottonwood (*Populus balsamifera trichocarpa*) or Trembling Aspen (*Populus tremuloides*); as these areas are often narrow areas, the birds likely forage in adjacent pine-fir forests and pastures.<sup>133</sup>

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- 128 Cannings and Davis, 2007
  - 129 Cannings 2004
  - 130 Levesque, pers. obs.
  - 131 Campbell et al. 1990
  - 132 Cannings and Angell 2001
  - 133 Cannings and Davis 2007





## Breeding

Western Screech-Owls nest in tree cavities excavated by woodpeckers or formed by some other means. In the Southern Interior, large Black Cottonwood trees are used most frequently for nesting.<sup>134</sup> Nest boxes are also used in many areas including B.C. No nest is built; the eggs are laid on the bottom of the cavity. Usually 3–5 eggs are laid between mid-March and late May. The incubation period is about 33–34 days. Chicks leave the nest when they are just over a month old and are fed out of the nest by the adults for another five weeks or so before the young disperse.<sup>135</sup>

## Food Habits

The main hunting method is perching low on an inconspicuous perch and waiting for prey to appear. Small mammals and birds are taken by short dives or stoops. Insects may be caught in the air or may be gleaned from foliage.<sup>136</sup>

Small animals of many types make up the diet of the Western Screech-Owl. Small mammals and birds are commonly taken. Insects are important mainly during warmer months. The exact diet varies annually, seasonally and locally; many unexpected prey species are captured at times including bats, fish, earthworms, and crayfish.<sup>137</sup>

## Compatibility with Human Landscapes

Western Screech-Owls need patches of forest with suitable cavities for nesting and roosting, and sufficient prey. This type of habitat can be provided in woodlots, riparian areas and undeveloped green spaces. The availability of suitable nest cavities likely affects the ability of the Western Screech-Owl to successfully breed, although if nest boxes are provided they will readily use them. Urban developments and forestry operations may negatively affect Western Screech-Owl habitat by removing forest stands and dead trees which serve as potential nest cavity trees. Western Screech-Owls occasionally collide with vehicles and windows.

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134 Bezener 2004

135 Cannings and Angell 2001

136 Cannings and Angell 2001

137 Cannings and Angell 2001



## 10.18. Great Horned Owl (*Bubo virginianus*)



Photo: ©Stuart Clarke

Identification (Length 56 cm; Wingspan 112 cm)

- Classified as a raptor in the Order *Strigiformes*.
- Large, stocky, big-headed owl with broad rounded wings.
- Three subspecies in B.C., varying mainly in colour tone of dark feathers and facial disk. Coastal birds are darker than interior and northern ones.
- Adults: Head very large with grey or brown facial disks. Prominent ear tufts on head. Throat white. Eyes yellow. Body and wings mostly brown variably spotted and barred. Underparts barred.
- Immatures: Similar to adults after first couple of months.
- Females are larger than males.
- Much larger and bulkier than Long-eared Owl.

Great Horned Owl status

COSEWIC: Not Listed

B.C. status: Yellow-listed

[Sample vocalizations](#)

### Distribution

Great Horned Owls inhabit most of the New World from the treeline, south to southern South America. The species is widespread and common throughout North America including all of B.C. except Haida Gwaii.<sup>138</sup>

### Movements

Great Horned Owls are resident throughout their range even the northernmost regions.<sup>139</sup>

138 Campbell et al. 1990; Houston et al. 1998

139 Houston et al. 1998



## Habitat

The Great Horned Owl occurs in nearly all terrestrial habitats in B.C. except alpine areas. Ecologically it is the night-time equivalent to the Red-tailed Hawk and utilizes the same habitats and prey.

## Population Status

The Great Horned Owl is not globally at risk. This species is common throughout its large range and is an adaptable species that utilizes many diverse habitats and prey species.

## Breeding

Great Horned Owls do not build their own nests but may add a lining of various materials to old nests of other species. Natural nesting sites include large stick nests in trees built by other birds, cliff ledges, and cavities in snags and rotting trees. Also used, though much less frequently, are various man-made structures, including buildings, and nest platforms erected for them or other species.<sup>140</sup>

The nesting period of Great Horned Owls in B.C. varies depending on local conditions as it does for nearly all bird species. In general, the more northern and eastern the location is, the later the nesting period.

Great Horned Owls lay their eggs between the middle of February and late May with the early third of the period being most frequent.<sup>141</sup> One to four eggs are laid usually with 2–3 days between each. After 30–32 days of incubation the eggs hatch. The young are fed in the nest for about 35 days, after which they leave the nest, but remain dependent on their parents for food for another month or more.

## Food Habits

Great Horned Owls hunt mainly by perching on elevated structures such as trees, bushes, telephone poles, lamp posts, or communications towers in open areas. Occasionally hunts while flying low over open areas. When prey is detected, the owl flies straight toward the animal, grabs it with its powerful feet and sharp talons, and carries it off.

A great variety of prey animals have been reported in the diet of this owl over its broad range. Small mammals up to the size of rabbits and hares make up about 90% of the diet in many regions. Waterfowl and other birds can also be important foods.

## Compatibility with Human Landscapes

If suitable foraging habitat exists nearby, Great Horned Owls are resilient to degradation of nesting habitat and are somewhat tolerant to disturbance of nests and roosts. They do not occur in heavily urbanized areas, unless well-wooded parkland is available. Rural areas with patches of open fields and woodlands are very good

<sup>140</sup> Houston et al. 1998

<sup>141</sup> Campbell et al. 1990



habitat for Great Horned Owls. Collisions with vehicles and electrocution account for large numbers of mortalities. Starvation of young during periods of food shortages is by far the largest contributor to Great Horned Owl mortalities.

Formerly very scarce in the Victoria region, Great Horned Owls have increased their population since the 1970s. This is possibly in response to the greater abundance of small mammal prey with the increased population of Grey Squirrels (*Sciurus carolinensis*), Eastern Cottontail Rabbits (*Sylvilagus floridanus*) and European Rabbits (*Oryctolagus cuniculus*) (all introduced species). Great Horned Owls are known to prey on other raptors and they may reduce recovery potential of less adaptable raptor species.<sup>142</sup>

### 10.19. Northern Pygmy-Owl (*Glaucidium gnoma*)



Photo: ©Jared Hobbs

Identification (Length 17 cm; Wingspan 31 cm)

- Classified as a raptor in the Order *Strigiformes*.
- Very small short-winged owl with narrow relatively long tail.
- Three subspecies in B.C. differing mainly in plumage colouration and geographic distribution.
- Adults: Head is red-brown with small pale spots on crown, and white eyebrows. Small facial disc. A false eye pattern on the back of the head formed by two oval black spots with white borders is distinct. Red-brown upperparts with small pale spots. The whitish underparts have dark streaks. The tail, relatively long for an owl, is dark with several narrow white bands. The eyes are yellow. The bill is yellow.

142 Bosakowski and Smith 2002



Northern Pygmy-Owl  
status

*G. g. grinnelli*  
COSEWIC: Not Listed  
B.C. status: Yellow-listed

*G. g. californicum*  
COSEWIC: Not Listed  
B.C. status: Yellow-listed

*G. g. swarthi*  
COSEWIC: Not Listed  
B.C. status: Blue-listed

[Sample vocalizations](#)

- Immatures: Similar to adult except fewer spots on head, bill dark and tail shorter.
- Flight: Undulating with quick bursts of flaps alternating with short glides.
- Smaller than other B.C. owls and similar in size to the Flammulated Owl. Western Screech-Owl (larger) and Flammulated Owl (dark eyes) are much more streaked overall, with shorter tails and ear tufts (not always visible). Northern Saw-whet Owl is similar in colour but larger with a much shorter tail and different plumage pattern. No other B.C. owl has such a relatively long tail except the much larger Northern Hawk Owl.

### Distribution

The Northern Pygmy-Owl has a patchy distribution from southeast Alaska to Central America. In B.C., it occurs throughout coastal areas except Haida Gwaii, and occurs widely in the southern two-thirds of the Interior. Recent survey data from the BC Breeding Bird Atlas and eBird Canada indicate it could also breed further north.

### Population Status

The Northern Pygmy-Owl is not globally at risk, but the subspecies *G. g. swarthi* is Blue-listed in B.C. The species is uncommon throughout its wide range in North America. The Canadian population was roughly estimated at 2,000-10,000 pairs.<sup>143</sup> On Vancouver Island, habitat change due to the forest industry may threaten the long-term existence of the endemic subspecies *G. g. swarthi*.<sup>144</sup>

The taxonomic status of some populations is uncertain. Birds from the southwest states and southward may be one or more distinct species. Three recognized subspecies inhabit B.C., differing mainly in colour and geographic distribution. One subspecies, *G. g. swarthi*, occurs only on Vancouver Island. It is darker, browner and less rufous than *G. g. grinnelli* of the coastal mainland. *G. g. californicum*, the third subspecies, is greyer than the other two subspecies and is less Rufous-coloured than *grinnelli*. It occurs in the north-central Interior.<sup>145</sup>

### Movements

The Northern Pygmy-Owl is non-migratory, though short distance elevational movements are common during the nonbreeding season. During winter in interior B.C., it is often seen along roads near valley bottoms where it is absent from during the rest of the year. Whether these birds are elevational migrants from the local area or longer distance migrants from farther north is unknown.<sup>146</sup>

<sup>143</sup> Kirk and Hyslop 1998

<sup>144</sup> Darling 2003

<sup>145</sup> Campbell et al. 1990

<sup>146</sup> Campbell et al. 1990





## Habitat

Forested habitats are preferred by the Northern Pygmy-Owl. On Vancouver Island, it uses old-growth and mature forests with openings in the forest and nesting cavities.<sup>147</sup> In the Okanagan Valley, it does not use valley bottoms during most of the year. However, during December and January of many years it is often seen at low elevations along roads, perched on fruit trees, telephone wires, or other objects.

Breeding habitat may be in a variety of forest types, but suitable nest cavities are most available in stands of old trees. Foraging may be done in quite open locations, including clearcuts and road corridors.

## Breeding

Little information is available about the reproductive biology of this species compared to most other raptors. Very few Northern Pygmy-Owl nests have been found in B.C. All five recorded in B.C. prior to 1990 were in old woodpecker holes in coniferous trees.<sup>148</sup> As many as seven eggs are laid and incubated for about four weeks. The young leave the nest when they are about 3–4 weeks old. They are weak fliers at first and are fed by the adults for some time after leaving the nest.<sup>149</sup>

## Food Habits

Northern Pygmy-Owls hunt during daylight and twilight hours, rather than at night as is the case for most other owls. They often search for prey from an elevated perch during the winter.

Small birds and mammals probably make up much of its diet in B.C. Insects are likely important in some regions during the warmer months. Amphibians and reptiles are known to be taken in areas outside of B.C.

## Compatibility with Human Landscapes

The Northern Pygmy-Owl has been recorded in urban and rural areas, but little is known of their nesting requirements as only a few nests have been found.<sup>150</sup>

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147 Darling 2003  
 148 Campbell et al. 1990  
 149 Holt and Peterson 2000  
 150 Campbell et al 1990



## 10.20. Burrowing Owl (*Athene cunicularia*)



Photo: ©Jared Hobbs

Identification (Length 19–25 cm; Wingspan 50–55 cm)

Burrowing Owl status

COSEWIC: Endangered  
B.C. status: Red-listed

Classified as a raptor in the Order *Strigiformes*, the Burrowing Owl is a small slender owl with long legs and a small round head lacking ear tufts. The eyes are yellow. Underparts are pale heavily barred with brown. Upperparts are brown with whitish spots.

### Distribution and Status

[Sample vocalizations](#)

Formerly found in open grassland and sage habitats in the southern interior of B.C., this is only one of two owls that breed in B.C. that is fully migratory (the other being the Flammulated Owl). Banded owls that bred in B.C. have been located in winter from coastal Washington south through California. Once considered extirpated as a naturally occurring breeding species in the province, attempts to reintroduce the species (the only raptor to be classified as Endangered under the [Wildlife Act](#)) are ongoing. Released captive bred birds have successfully bred in the wild, sometimes attracting unbanded wild or captive bred birds released in previous years' birds. Some birds have returned following their winter migration; return rates are similar to those of natural populations in other areas. Appropriate habitat for this species is very limited in B.C. and continued management and conservation efforts are focused increasingly on habitat stewardship and management. Occasionally, an individual owl does not migrate, choosing instead to remain near the breeding grounds; when this occurs, recovery program volunteers often assist their survival chances by placing insulating straw over their burrow, and providing occasional prey items for them during the winter.



## Habitat

This species is native to the shrub-steppe areas of the southern interior of B.C. Successful stewardship partnerships with ranchers promote maintaining healthy grassland habitat and practising grazing rotations that benefit the owls and livestock.

## Breeding

Burrowing Owls nest in burrows underground. While they spend some effort preparing the burrow for breeding, in natural situations they rely on fossorial mammals like ground squirrels, badgers and marmots to create the burrows for them. Historically, such mammals have been reduced in abundance in B.C. due to conflicts with the ranching community as cattle and horses can break their legs by unwittingly stepping in areas with hidden underground burrow systems. Reintroduction attempts in B.C. have focused on captive breeding and release of Burrowing Owls into artificial burrows and nest boxes that are installed underground and made of materials that can support the weight of livestock; thus avoiding the conflict. Around 100 captive-bred owls are kept over winter and released to these sites in the spring; each year many remain and breed, sometimes producing over 200 wild-born young.<sup>151</sup> They lay an average clutch of nine eggs, with a range of 6–14 eggs. Hatchlings are relatively immobile, with eyes closed and fed by parents, but they gain enough mobility within 10–15 days to venture outside of their burrow entrances. By 35–40 days after hatch, young owls are capable of sustained flight. Fledglings may begin dispersing from their nest area at 60–70 days of age, although some remain near their natal site until migration.<sup>152</sup>

## Food Habits

Burrowing Owls hunt at all times of the day and night with peaks around dawn and dusk. They are opportunistic hunters and will take insects, birds, small mammals, reptiles and other small animals.<sup>153</sup>

## Compatibility with Human Landscapes

Burrowing Owls can breed in close proximity to human developments provided they are not harassed and the habitat around the nesting burrow is in good condition. However, this species often perches and forages close to roads, and collisions with vehicles is a major source of mortality.

151 M. Chutter pers. comm

152 Environment Canada. 2012

153 Haug et al. 1993



## 10.21. Spotted Owl (*Strix occidentalis*)



Photo: ©Jared Hobbs

Identification (Length 45–48 cm; Wingspan 100 cm)

Spotted Owl status

COSEWIC: Endangered  
B.C. status: Red-listed

Classified as a raptor in the Order *Strigiformes*, the Spotted Owl is a medium-sized, round-headed, short-tailed, broad-winged owl with dark eyes and no ear tufts. Differs from the similar Barred Owl by having a consistent pattern of white spotting on underparts rather than barring of the upper chest contrasting with vertical streaking on the rest of the ventral surface. It also is usually darker in overall plumage and has different vocalizations.

[Sample vocalizations](#)

### Distribution and Status

It is estimated that there are currently less than 10 breeding pairs of Spotted Owls in B.C.<sup>154</sup> This is considerably fewer than the estimated 100 pairs in 1991<sup>155</sup> and the estimated 500 pairs prior to European colonization<sup>156</sup>. This decline in population is attributed largely to the loss and fragmentation of mature and old-growth forested habitat in the Spotted Owl's range, and to the relatively recent and increasing competition with Barred Owls. Spotted Owls are patchily distributed between Vancouver and Manning Park north to about Lillooet. They are non-migratory throughout their range but will use different parts of their territory during the winter.

### Habitat

In B.C., the Spotted Owl uses two broad old-growth forest types. Owls living closer to the coast inhabit wetter forests, while those farther inland inhabit drier forests.

<sup>154</sup> M. Chutter, pers. comm.

<sup>155</sup> Dunbar et al. 1991

<sup>156</sup> Blackburn and Harestad 2002



Spotted Owls will also use some younger forests for foraging and dispersal. Prime Spotted Owl habitat is mature conifer stands older than 140 years.<sup>157</sup>

### Breeding

Spotted Owls do not build their own nests, but depend on naturally occurring or previously constructed nest sites that typically possess nest platforms that are at least 50 cm in diameter. Nest sites include broken treetops, tree cavities, abandoned raptor nests, mistletoe brooms, and debris accumulations captured in clusters of branches. There is substantial inter-annual variation in the number of pairs that breed, with few owls breeding in “poor” years and most owls breeding in “good” years. Most Spotted Owls do not breed every year. Clutch sizes typically range from 1–3 eggs. Although some Spotted Owls breed as 1- or 2-year-olds, most breed beginning as 3-year-olds. Juvenile Spotted Owls disperse from the natal area at the end of the breeding period, beginning in September and October.<sup>158</sup>

### Food Habits

Spotted Owls perch and search for their prey within the forest. They hunt at night mainly for small mammals which make up about 90% of their diet in northern parts of their range. Their primary prey species are the Northern Flying Squirrel (*Glaucomys sabrinus*) and the Bushy-tailed Woodrat (*Neotoma cinerea*).<sup>159</sup>

### Compatibility with Human Landscapes

Spotted Owls require large tracts of contiguous old-growth forest, but could potentially occur on the periphery of rural environments if unlogged forest is nearby.

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157 Kirk 1999  
 158 Chutter et al, 2004.  
 159 Gutiérrez et al. 1995





## 10.22. Barred Owl (*Strix varia*)



Photo: ©Stuart Clarke

Identification (Length 44–60 cm; Wingspan 105 cm)

- Classified as a raptor in the Order *Strigiformes*.
- Medium-sized, round-headed, short-tailed, broad-winged owl.
- Adults: Head mostly brown with well-developed facial discs, no ear tufts. Upper breast heavily brown barred horizontally, lower breast and belly are whitish with long vertical, heavy brown streaks. Tail is dark brown, heavily barred buff or whitish. Bill is orange-yellow. Eyes dark.
- Young birds retain some downy feathers after leaving nest until late summer. Reach adult plumage at about four months old.
- Most similar to Spotted Owl (very rare and local in B.C.) but Barred Owl (common and widespread in B.C.) has streaked belly, a paler face, is paler overall and has different vocalizations. Great Gray Owl is much larger with yellow eyes. The dark eyes distinguish Barred Owl from all other B.C. owls except the Spotted Owl, Barn Owl (much paler body and face) and Flammulated Owl (much smaller).

### Distribution

Barred Owls are resident in parts of Mexico, in the eastern and northwestern United States, eastern Canada, the central Prairie Provinces, the northern Rocky Mountains, and most of B.C.; however, they have yet to be recorded on Haida Gwaii.

Barred Owl status

COSEWIC: Not listed

B.C. status: Yellow-listed

[Sample vocalizations](#)



## Population Status

The Barred Owl is not globally at risk. The Canadian population was estimated at 10,000 to 50,000 pairs (1998).<sup>160</sup> Almost unknown in B.C. prior to the 1950s, Barred Owls are now common throughout most of B.C. Barred Owls were first recorded in coastal B.C. at Surrey in 1966 and in Victoria in 1969. The population near the coast has increased since then and it is likely now the most abundant owl on southern Vancouver Island.<sup>161</sup>

## Movements

Barred Owls have managed to dramatically expand their range in western North America, during the last 45 years, without being a truly migratory species. Southern birds are resident in their breeding territories. Barred Owls in northern B.C. may move south routinely during the winter.<sup>162</sup> During winters of low prey populations, Barred Owls, like several other northern owl species, range widely in search of more abundant prey.<sup>163</sup>

## Habitat

In most parts of North America, Barred Owls are strongly associated with large tracts of old-growth or mature forest near water. Although found in B.C. in remote areas with large old trees, they have also dispersed into urban and rural habitats. In areas such as farmlands, and rural and urban habitats, the Barred Owl often lives in parks, riparian corridors, and ravines. Breeding habitat must contain trees of sufficient size to provide cavities large enough for the female to nest in.<sup>164</sup>

## Breeding

Cavities in large trees are the most common nest site. A variety of other sites including old nests of other species, nest boxes and the ground have been reported. Barred Owls do not build a nest.<sup>165</sup> One to five eggs are laid at 1–3 day intervals during the spring. Incubation takes 28 to 33 days per egg and is begun after the first or second egg is laid. The eggs hatch at about the same intervals resulting in chicks of uneven age and size. Four to five weeks after hatching, although still unable to fly, the young leave the nest but stay in the area. The whole family stays together, the parents catching most of the food, until fall when the young disperse.<sup>166</sup>

## Food Habits

Barred Owls hunt primarily during the night. Perching on a structure with an open flight path to habitat with potential prey, Barred Owls wait, watch and listen. When prey is located they drop down grabbing the prey with their talons.

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160 Kirk and Hyslop 1998  
 161 Campbell et al. 1990  
 162 Campbell et al. 1990  
 163 Mazur and James 2000  
 164 Mazur et al. 1997  
 165 Mazur and James 2000  
 166 Mazur and James 2000



Barred Owls are versatile and adaptable feeders over their wide range. Many species of prey are recorded including various small mammals, birds, amphibians, reptiles, fish, and invertebrates.<sup>167</sup>

### Compatibility with Human Landscapes

Capable of breeding and hunting in urban areas that support stands of mature trees. Great Horned Owl, Northern Goshawk, mustelids and raccoons have been noted as predators of eggs, nestlings and adult Barred Owls. Barred Owls have greatly expanded their range in B.C., including urban and rural environments, and are implicated in the decline of smaller owl species such as the Western Screech-Owl.

### 10.23. Long-eared Owl (*Asio otus*)



Photo: ©Jared Hobbs

Identification (Length 35-40 cm; Wingspan 90-100 cm)

Long-eared Owl status

COSEWIC: Not Listed

B.C. status: Yellow-listed

[Sample vocalizations](#)

- Classified as a raptor in the Order *Strigiformes*, the Long-eared Owl is a slim, medium-sized owl with long wings.
- The plumage is generally brown and buff with darker mottling and barring throughout. Its long ear tufts are close to the middle of the head and usually held erect. The facial disc is reddish. The eyes are yellow. Short-eared Owl has very short inconspicuous ear tufts.
- Appears very similar to Short-eared Owl in flight but the buff and black wrist marks are less prominent. Great Horned Owl is much larger.

<sup>167</sup> Mazur and James 2000



## Distribution and Status

Uncommon to rare, resident breeder on the Mainland south of Prince George. Northern breeders likely somewhat migratory; seasonal dispersal also likely occurs. Rare on the south coast where most of the records are of wintering birds. The largest breeding population known in the province is in the Okanagan Valley, though recent Breeding Bird Atlas surveys have confirmed breeding in the Peace River Valley and West Kootenay. Recent and historical records of the species outside of these regions indicate that its potential breeding range may expand beyond these areas.

## Food Habits

Hunts at night by flying low over open ground while searching for prey. Mainly feeds on small mammals, although birds can also be important.<sup>168</sup> A study in the southern Okanagan Valley found that small mammals were more than 98% of the diet, and voles were about 50% of the diet.<sup>169</sup>

## Habitat

In the Okanagan most nesting is in thick riparian forest of trees and shrubs. In the winter, it roosts in dense conifers especially Western Redcedar. It forages over open areas including wetlands, old fields and pasture. They sometimes roost communally in the Okanagan Valley (up to six birds).

## Breeding

The Long-eared Owl nests usually in an abandoned nest of a crow, magpie or hawk, from 3–9 m above the ground; occasionally on the ground. The female usually lay 4–6 eggs which are incubated for 25–30 days. Fledging takes another 23–24 days.

## Compatibility with Human Landscapes

Long-eared Owls can breed in urban and rural environments provided thickets of deciduous or coniferous trees are available.

<sup>168</sup> Marks et al. 1994

<sup>169</sup> Campbell et al. 1990



## 10.24. Short-eared Owl (*Asio flammeus*)



Photo: ©Stuart Clarke

Identification (Length 38 cm; Wingspan 97 cm)

- Classified as a raptor in the Order *Strigiformes*.
- Medium-sized owl with long narrow wings.
- Adults: Tawny brown overall. Prominent facial disc. The small ear tufts are only visible at close range. Eyes are yellow. The bill is black. The brownish breast is strongly streaked by dark brown. The belly is paler with less streaking. Wings are generally brown with two distinctive marks visible in flight; a buffy patch on the upperside and a black mark on the underside of the wings near the wrist.
- Females: Slightly larger, darker and buffier.
- Flight: easy, bouncing, and erratic flight is similar only to Northern Harrier. Often hovers briefly 1–3 m above the ground when potential prey is spotted.
- This mid-sized owl hunts during both the night and day; during daylight hours it can most often be observed foraging in late afternoon/early evening. Appears similar to Long-eared Owl in flight and is difficult to separate. Long-eared Owl very rarely flies during the day unless disturbed, has less distinct black and buff wing markings and has a rufous facial disc. While perched, Long-eared Owls show long ear tufts; Short-eared Owls have very short ear tufts that are usually not noticeable. May look like Barn Owl, especially during darkness when seen in headlights or other artificial lighting. Barn Owl is much paler below and on the face, is unstreaked and has a unique rusty-brown colour to upperparts. Short-eared Owl perches in a less upright position than most other owls.

Short-eared Owl status

COSEWIC: Special  
Concern

B.C. status: Blue-listed

[Sample vocalizations](#)





## Distribution

The Short-eared Owl has a very wide distribution that includes much of Europe, Asia, North America, and South America as well as several remote oceanic islands. Many continental populations withdraw from northern parts of their range for the winter and occur south of the normal breeding areas.

## Population Status

Globally, the Short-eared Owl is not considered at risk and has a very large range. The species is considered at risk in Canada and B.C. as evidenced by its Special Concern (federal) and Blue-list (provincial) designations. Major population declines in eastern, central, and parts of western North America are of concern and the species is also listed by several states as a species at risk. Presently, numbers appear to be declining in B.C., but their status is uncertain because their nests are extremely difficult to survey for.<sup>170</sup>

## Movements

Short-eared Owls are migratory throughout much of B.C.; however, those in the south and some in the Peace River valley are resident. In B.C., early spring migrants start to move through the province during late March. The main northward movement is in April. Fall migration peaks in late October and continues through November.

## Habitat

Short-eared Owls prefer open habitats of many types. Marshes, grasslands, agricultural fields, coastal foreshores and beaches, airports, and sagebrush are all commonly used areas in B.C. They are frequently found in very open areas sitting on the ground.

Most nests in B.C. have been found in shrubby fields near agricultural areas. This may be because nests in such locations are much more likely to be found than ones in large wetlands or remote areas.

During migration, Short-eared Owls may occur in nearly any area that includes open habitat though they occur most frequently at estuaries, marshes and beaches along the entire coast and freshwater wetlands throughout the interior.

The few Short-eared Owls that winter on Vancouver Island are usually seen at agricultural fields or larger estuaries. The Lower Mainland, including Richmond and Delta, was historically a major wintering area with roosts containing more than 100 owls on Sea and Iona islands in years of high vole abundance during the 1970s. However, winter numbers have declined in recent decades as old-field habitat has been converted to other uses. On rare occasions, they may winter in almost any part of B.C., including Haida Gwaii, Vancouver Island, the Okanagan, the Cariboo, and the Peace regions.<sup>171</sup>

<sup>170</sup> Cooper and Beauchesne 2004

<sup>171</sup> Campbell et al. 1990



### Breeding

Short-eared Owls nest on the ground. Usually a shallow scraped out nest is made and lined with grasses and other vegetation. It is often on a slightly elevated spot such as a hummock or small ridge. Although up to 13 eggs may be laid, the usual clutch is 5–6. Eggs hatch after about 26–37 days. The young leave the nest when they are about two weeks old and move around on foot for about three weeks until they are able to fly.<sup>172</sup>

### Food Habits

Short-eared Owls search for prey by flying above suitable habitat and listening and looking for prey. They hover briefly before dropping down quickly and grabbing the prey in their talons. Small mammals are the principal prey over most of North America, *Microtus* voles being most important in most places. Other small rodents, shrews, and rabbits are also common in the diet. Birds are also common but of secondary importance. In some places, however, Short-eared Owls specialize in hunting birds.<sup>173</sup>

### Compatibility with Human Landscapes

The Short-eared Owl is threatened by rapid urbanization, industrialization, intensive agriculture and human disturbance. Similarly, fragmentation of habitats may accentuate the magnitude of population fluctuations of their rodent prey base.

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172 Holt and Leasure 1993

173 Holt and Leasure 1993



## 10.25. Northern Saw-whet Owl (*Aegolius acadicus*)



Photo: Berry Wijdeven

Identification (Length 20 cm; Wingspan 43 cm)

- Classified as a raptor in the Order *Strigiformes*.
- Small owl with broad rounded wings and short tail.
- Two subspecies in B.C.; differ mainly in colouration and breeding distribution.
- Adults: Large round head with whitish facial discs edged in red-brown, no ear tufts. Eyes are yellow. Upperparts reddish brown. Small white streaks on crown and neck; upper wings, back and tail spotted with white. Underparts white, with wide rufous streaks.
- Immatures: Fledglings plumage very different for first few months out of nest with underparts entirely dark red-brown. Facial discs and upperparts are also darker than adult.
- Females are larger than males.
- Flight low with quick wing beats rising up to perch.
- Boreal Owl is similar but larger with black-bordered facial disks, and is more chocolate-brown. Western Screech-Owl is similar in size, but is brownish-grey overall and has ear tufts. The Northern Hawk Owl is larger with long tail.

Northern Saw-whet Owl status

*A. a. acadicus*  
COSEWIC: Not Listed  
B.C. status: Yellow-listed

*A. a. brooksi*  
COSEWIC: Not Listed  
B.C. status: Blue-listed

[Sample vocalizations](#)

### Distribution

The main breeding range is the southern half of all provinces in Canada from B.C. to the Maritimes. It extends farther north on the Pacific Coast into Alaska, and at higher elevations in most western states and some mountain areas of northern and central Mexico. During winter many move into the eastern and central United States. It breeds throughout B.C. except possibly some north-central and northeastern parts.



## Population Status

The Northern Saw-whet Owl is not considered to be at risk. Cannings (1993) estimated at least 100,000 to 300,000 individuals in North America and indicated the population was likely declining slowly due to loss of habitat. Northern Saw-whet Owls that breed on Haida Gwaii are of the subspecies *A. a. brooksi* and are Blue-listed provincially. Saw-whets breeding in the rest of the province are *A. a. acadicus*. It is not known whether *acadicus* occurs on Haida Gwaii during the nonbreeding season.

## Movements

Northern Saw-whet Owls occur year-round throughout their breeding range in North America, though many of them move southward during the winter. In eastern North America, Northern Saw-whet Owls are known to make long-distance migrations. Northern Saw-whet Owls are migratory but not much is known about their migratory strategies in western North America. In the west, some movements may be short-distance elevational ones while others may be much longer latitudinal migrations. Fairly large numbers of Northern Saw-whet Owls pass through south-coastal B.C. in October and November.<sup>174</sup> Recent banding efforts have shown that saw-whets trapped during the fall at the Rocky Point Bird Observatory at the southern tip of Vancouver Island have come from as far north as Tatlayoko Lake (west of Williams Lake) and have gone as far south as Oregon.<sup>175</sup>

## Habitat

Northern Saw-whet Owls breed in a variety of forested habitats. Across mainland B.C., they frequently nest in younger forests, including second growth. Nests are often near lakeshores or in riparian forest.<sup>176</sup>

In the Okanagan Valley, Northern Saw-whet Owls breed in two different habitats. In the valley bottom, they nest in the remnant deciduous riparian forests present in some areas. At higher elevations, they nest in coniferous forests of Ponderosa Pine and Douglas-fir.<sup>177</sup>

On Haida Gwaii, the ecology of this endemic subspecies is part of an ongoing research.<sup>178</sup> This owl is found throughout the island archipelago, and forages in a wide range of second-growth and old-growth forests and also along the beach intertidal zone. It preys upon invertebrates, birds, and mammals which range in size from beach isopods,<sup>179</sup> to the introduced rats. It nests in tree cavities, and roosts in both second-growth and old-growth forests.<sup>180</sup>

<sup>174</sup> Campbell et al. 1990

<sup>175</sup> M. Chutter pers comm.

<sup>176</sup> Campbell et al. 1990

<sup>177</sup> Cannings 1987

<sup>178</sup> Provincial Northern Saw-whet Owl Recovery Team. 2012

<sup>179</sup> Sealey 1999

<sup>180</sup> Doyle et al. 2012



During winter, individuals may roost (during the day) in the same location for weeks; often in a sheltered spot in a cedar or other conifer.<sup>181</sup>

### Breeding

Cavities in trees made by woodpeckers are the most important nest site for Northern Saw-whet Owls. Cavities in trees formed by branches breaking off or some other means are also used. Nest boxes have been used in B.C. and many other areas. Most commonly, 5–6 eggs are laid at two day intervals. After being incubated for 27–29 days the eggs hatch. Month-old young are able to fly fairly well when they fledge (young of many species of owls leave the nest before they can fly well or at all). At least one adult stays and provides food for the young for another month or so.<sup>182</sup>

### Food Habits

The Northern Saw-whet Owl hunts at night by perching on a fairly low (1–3 m) object and locating prey using hearing and vision. It captures prey on the ground by grasping it in its talons.

The main food is small mammals, the species depending on local availability. The list of small mammals recorded in their diet over North America, includes nearly every species that occurs in the saw-whet's range. Overall, deer mice (*Peromyscus sp.*) are the predominant prey. A study in the Okanagan Valley found that deer mice and other rodents made up most of the diet; less important prey included shrews and songbirds.<sup>183</sup> On Haida Gwaii, saw-whets forage in intertidal habitats for a variety of invertebrates.<sup>184</sup>

### Compatibility with Human Landscapes

This species is known to adapt well to urban and rural environments outside of the breeding season. Logging of older forests throughout its range has undoubtedly reduced the amount of suitable breeding habitat for this species, particularly through the loss of snags used for nesting. In recent decades, the Barred Owl has expanded its range into coastal areas and is thought to be having an impact on small owl species by preying on them and excluding them from some habitats.

181 Campbell et al. 1990; Cannings 1993

182 Campbell et al. 1990; Cannings 1993

183 Cannings 1987

184 Hobson and Sealy 1991





## 10.26. Other Species

The following species do not occur in urban and rural areas in B.C. often enough to warrant specific management practices. However, if guidelines are followed for other raptors, then most of these species will likely benefit if and when they occur in such environments.

### 10.26.1. *Broad-winged Hawk (Buteo platypterus)*

Identification (Length 34–42 cm; Wingspan 82–92 cm)

The Broad-winged Hawk is a black and white hawk of the Order *Accipitriformes*, similar in shape to Red-tailed Hawk but smaller. Light and dark morphs occur; the dark is very rare. Light birds have whitish underwings with a narrow black border except the inner leading edge of the wing. The tail has white and black bands.

#### Distribution and Status

A rare breeder in B.C., mainly known from areas along the Rocky Mountains in the Peace River, Fort Nelson and Kootenay areas, but occasionally as far west as Prince George. In recent years, it has been found annually in very small numbers during fall migration in extreme southern Vancouver Island.

#### Habitat

Inconspicuous and secretive during the breeding season, Broad-winged Hawks are rarely seen at that time in B.C. Little is known of its breeding habitat in the province. The few breeding records for B.C. indicate that like elsewhere in its range, nesting habitat is extensive mixed or deciduous forests with clearings, often near water.

In recent years, during fall migration (mainly late September to late October), a handful of Broad-winged Hawks have been seen near Rocky Point on southern Vancouver Island. The habitat there is very hilly with forested parks, hobby farms, houses and military bases. They are occasionally seen flying over Victoria. It is not the type of habitat that attracts them to this area. Rather, like many other raptors, Broad-winged Hawks prefer not to fly across large bodies of water. Any Broad-winged Hawk on Vancouver Island during fall migration likely ends up at the southern tip of the Island where it waits for the right weather conditions to cross Juan de Fuca Strait on its way south.

#### Food Habits

Broad-winged Hawks hunt by perching unobtrusively in the forest, often at the edge of a clearing, and watching for potential prey. The wide range of prey in their diet includes small mammals, amphibians, insects, and young birds.<sup>185</sup>

Broad-winged Hawk  
status

COSEWIC: Not Listed  
B.C. status: Blue-listed

185 Goodrich et al. 1996



### 10.26.2. *Ferruginous Hawk (Buteo regalis)*

Identification (Length 56–69 cm; Wingspan 135–145 cm)

The Ferruginous Hawk of the Order *Accipitriformes* is similar to the Red-tailed Hawk, but slightly larger with relatively longer more pointed wings. Light- and dark-type birds occur but light ones are much more frequent. Light adults are nearly all white below with rusty coloured legs and mostly dark above. The tail is variable: all white or sometimes with some pale rusty or grey near the tip. Some Red-tailed Hawks are very pale with whitish tails and are best separated by the different shape and proportions.

Ferruginous Hawk status

COSEWIC: Threatened

B.C. status: No status

[Sample vocalizations](#)

#### Distribution and Status

B.C. is at the very edge of its range and as a rare bird in the province its status is listed as “unknown”. It has bred here in the past as evidenced by two historical breeding records from the Southern Interior in 1968 and 1978. Most sightings are during migration. Ferruginous Hawks from central Washington move north to Alberta after breeding<sup>186</sup> and possibly contribute to summer and fall sightings in B.C. Spring sightings may be birds breeding in the province or spring migrants that have over shot their normal range.

#### Habitat

In other parts of its range, the Ferruginous Hawk uses grasslands, deserts and shrub-steppe habitats. Because there have been so few sightings in B.C. the preferred habitat in the province is little known. Most sightings have been in open dry locations in the southern interior especially the Okanagan and Nicola valley areas. Both nests that have been reported in B.C. were in trees.<sup>187</sup> The species has likely been extirpated as a breeding bird from B.C. as breeding has not been documented here for over three decades.<sup>188</sup>

#### Food Habits

Searches for prey while perched or flying in open habitats. In the western part of its range the principal prey are hares and rabbits.<sup>189</sup> Nothing is known about its diet in B.C.

<sup>186</sup> Watson and Pierce 2001

<sup>187</sup> Campbell et al. 1990

<sup>188</sup> M. Chutter, pers. comm.

<sup>189</sup> Bechard and Schmutz 1995



### 10.26.3. Rough-legged Hawk (*Buteo lagopus*)

Identification (Length 46–59 cm; Wingspan 122–143 cm)

- Classified as a raptor in the Order *Accipitriformes*.
- The Rough-legged Hawk is similar in size and shape to a Red-tailed Hawk but with different proportions and colour patterns. Like several other hawks, there are light and dark birds with various intergrades. Light birds are most common in B.C.
- Like the Swainson's Hawk, the Rough-legged Hawk has longer, narrower wings than the Red-tailed Hawk and usually flies with wings slightly uptilted.
- The main plumage feature in all Rough-legged Hawks is the white tail with one broad dark band at the tip. Light birds have a dark mark on the underwing near the wrist.

#### Distribution and Status

This hawk breeds around the globe in Arctic tundra regions. It occurs in B.C. only during the nonbreeding season from October to May. It winters in southern B.C. mainly in the Fraser Lowlands, the Thompson and Okanagan Valleys, and near Creston.

#### Habitat

During the breeding season it occurs over tundra. During the non-breeding season it frequents grasslands, wetlands and agricultural fields.

#### Food Habits

Searches for prey by soaring over open areas. Its primary food at all times of the year is small mammals. During the winter, voles, mice and shrews make up much of the diet.<sup>190</sup>

#### Compatibility with Human Landscapes

A considerable number of Rough-legged Hawks winter in the Lower Fraser Valley and occasionally in Southern Interior valleys in agricultural areas close to human developments and roads.

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<sup>190</sup> Bechard and Swem 2002



#### 10.26.4. Gyr Falcon (*Falco rusticolus*)

Identification (Length 50–61 cm; Wingspan 110–130 cm)

The Gyr Falcon of the Order *Falconiformes* is the largest falcon in the world. It has the typical falcon shape (pointed wings and narrow tail) although the wings are relatively broader than in other large falcons. Their variable plumage can be white to dark grey, or dark brown. Gyr falcons lack the broad dark vertical mark on the face of the Peregrine Falcon, and unlike the peregrine, the tail extends far beyond the wing on perched birds.

##### Distribution and Status

Mainly an Arctic species; in B.C., the Gyr Falcon is only known to breed in the extreme northwest part of the province, though it may breed in other parts of the north (sightings have occurred in Spatsizi Park as well as in the extreme northeast corner of the province). It can occur throughout the rest of the province during the nonbreeding season. Most sightings are along the coast. A very small number winter each year in the Lower Mainland.

Gyr Falcon status

COSEWIC: Not at Risk  
B.C. status: Blue-listed

##### Habitat

Prefers open country year-round. During the winter it is seen most often in farm fields near Boundary Bay and Roberts Bank where one or two birds occur most winters. In coastal areas, it is often seen along rocky shorelines and estuaries.

[Sample vocalizations](#)

##### Food Habits

The Gyr Falcon is a versatile hunter able to locate prey while perched, soaring or actively flying. It will chase prey for long periods of time unlike most other raptors, sometimes forcing the prey high into the air. The Gyr Falcon's diet is mostly of birds up to the size of grouse and geese.<sup>191</sup> During the winter in coastal B.C., it likely preys mainly on waterfowl and seabirds.

#### 10.26.5. Northern Hawk Owl (*Surnia ulula*)

Identification (Length 41 cm; Wingspan 71 cm)

The Northern Hawk Owl is a medium sized owl of the Order *Strigiformes* with relatively long wings and tail. Facial disc has a dark border. The eyes are yellow. It is dark brown above with pale spots. Pale below barred with dark brown. It is darker brown than the smaller and shorter tailed Northern Saw-whet Owl. It has a longer tail than the Boreal Owl. When seen perched, it appears more like a falcon than like other owls due to its long tail and less upright posture.

<sup>191</sup> Clum and Cade 1994



Northern Hawk Owl  
Photo: ©Stuart Clarke



### Distribution and Status

Widespread in B.C. except Vancouver Island and Haida Gwaii. Although common in the north of the province, it is thinly distributed in appropriate habitat in the south.

### Habitat

In B.C., it breeds in areas of spruce forest. In the southern half of B.C., spruce forests are found at higher elevations. In northern B.C., spruce forests are more widespread and so is the Northern Hawk Owl. Like many northern raptors, it may move in search of prey and at that time can occur in urban and rural habitats mainly agricultural areas.

### Food Habits

Hunts during daylight or darkness. Mainly hunts by perching high up in a tree with a view of open ground. It specializes in capturing small mammals—primarily voles and mice.<sup>192</sup>

#### 10.26.6. *Great Gray Owl (Strix nebulosa)*

Identification (Length 61-84 cm; Wingspan 132 cm)

The Great Gray Owl of the Order *Strigiformes* is a very large, greyish owl with large facial discs, yellow eyes and no ear tufts. Only the Great Horned Owl (has ear tufts) and Snowy Owl (much paler) are similar in size to the Great Gray Owl. The Barred Owl is smaller with dark eyes.

### Distribution and Status

An uncommon resident in the interior of the province and rare winter visitor to southwestern B.C.

Northern Hawk Owl  
status

COSEWIC: Not at Risk  
B.C. status: Yellow-listed

[Sample vocalizations](#)

Great Gray Owl status

COSEWIC: Not at Risk  
B.C. status: Yellow-listed

[Sample vocalizations](#)

<sup>192</sup> Duncan and Duncan 1998





Great Gray Owl  
Photo: ©Jared Hobbs

### Habitat

Although a bird of the forest, it is usually seen along the edge of the forest adjacent to an open area. In areas where this species is common it can be seen sitting on fence posts or telephone poles along roads in areas of forest and open habitats. It usually nests in abandoned stick nests of other large raptors, but also will nest in the top of snags and on artificial platforms.

### Food Habits

Hunts mainly at night, but also will hunt during twilight. It usually perches in an elevated position overlooking potential prey habitat. The diet is almost entirely of small mammals, mainly rodents. Like several other northern raptors, Great Gray Owls will move widely if there is a lack of prey in their nesting region.<sup>193</sup>

#### 10.26.7. *Snowy Owl (Bubo scandiacus)*

Identification (Length 58 cm; Wingspan 132 cm)

The Snowy Owl is a large, mostly white owl of the Order Strigiformes. The white plumage has a variable amount of black barring depending on age and sex with adult males being almost pure white, immature females having the most dark markings, and adult females and immature males falling in between. The eyes are yellow. About the same size as the Great Horned Owl (some individuals of which can be very pale) but lacks ear tufts.

<sup>193</sup> Bull and Duncan 1993



Snowy Owls  
Photo: ©Stuart Clarke



### Distribution and Status

Circumpolar, breeding north of the treeline. During winter may move south. In some years they travel long distances to the central United States.

#### Snowy Owl status

COSEWIC: Not at Risk  
B.C. status: Blue-listed

Occurs in B.C. only during the winter. In years of major food shortages on the breeding grounds, major irruptions occur and dozens may be seen on the Lower Mainland and southern Vancouver Island.

### Habitat

#### [Sample vocalizations](#)

The Snowy Owl inhabits open Arctic tundra during the breeding season, and open habitats of many types during winter when it moves south of the treeline. In B.C., it is most often seen in agricultural fields, beaches, estuaries, wetlands, and airport fields. It commonly perches in trees and on the ground, fence posts, towers and buildings.

### Food Habits

Hunts mainly by sitting and scanning for potential prey. Pounces on prey on the ground; will chase birds through the air or take them off the water. Primarily takes small mammals to the size of large hares. Birds up to the size of geese are also taken.<sup>194</sup>

<sup>194</sup> Parmelee 1992



#### 10.26.8. *Boreal Owl (Aegolius funereus)*

Identification (Length 21–28 cm; Wingspan 55–62 cm)

The Boreal Owl of the Order *Strigiformes* is a small owl with a large head and long wings. Facial disc is greyish-white with a dark brown border. The eyes are yellow. Underparts are whitish streaked by dark brown. The upperparts are brown with white small white spots. As with the related Northern Saw-whet Owl, the immature's plumage is quite distinct from the adults, being a uniform dark sooty brown with obvious white eyebrows.

Boreal Owl status

COSEWIC: Not at Risk  
B.C. status: Yellow-listed

#### Distribution and Status

Common and widespread throughout most of interior B.C. Generally resident in its breeding territory. However, like several other northern raptors, it will move to new areas during winter in search of food.

#### Habitat

Breeding habitat is boreal spruce forests with deciduous stands in northern parts of the province, and subalpine forests of spruce and subalpine fir in the southern parts. It nests in cavities in trees, but also uses nest boxes in many parts of its range including B.C. During winter, the Boreal Owl may be found in unusual habitats and locations. Very few sightings of this species have been made during the winter away from known breeding locations.

[Sample vocalizations](#)

#### Food Habits

Boreal Owls hunt at night by sitting and waiting for prey then pouncing. Small mammals, mainly mice and voles, make up most of the diet. Birds and insects are also taken.<sup>195</sup>

<sup>195</sup> Hayward and Hayward 1993



*Nesting Bald Eagle with young.*

Photo: Judith Cullington



## Glossary

**Biodiversity:** the variety of life on earth in all its forms including genes, species, and ecosystems and the natural processes that link and maintain them.

**Buffer:** an area of land that surrounds and protects a raptor nest (or other sensitive habitat) from the adverse effects of activities on, or encroachment from, adjacent lands.

**Due diligence:** the level of judgment, care, prudence, determination, and activity that a person would reasonably be expected to undertake under certain circumstances.

**Guidelines:** a set of recommended or suggested methods or actions that should be followed in most circumstances to assist administrative and planning decisions, and their implementation in the field. Guidelines may consist of policy statements, procedures, or checklists. They are provided as a broad framework of recommended actions to be taken and, therefore, provide some flexibility for decision making. Note that guidelines cannot, by definition, be mandatory; such actions are prescribed by regulations or rules. (Dunster and Dunster 1996).

**Mitigation:** measures implemented to control, reduce or eliminate a potential adverse impact of a project, including restorative measures. (Environmental Assessment Office 2003).

**Monitoring:** the processes and activities that need to take place to characterize and monitor the quality of the habitat.

**Professional biologist:** is registered in B.C. under the *College of Applied Biology Act*, and acting under the college's code of ethics and subject to disciplinary action by the college, and who, through demonstrated suitable education, experience, accreditation and knowledge relevant to the particular matter, may be reasonably relied on to provide sound advice within their area of expertise.

**Raptors:** birds of prey, including hawks, owls, falcons, and eagles.

**Species at risk:** a species that has been defined as 'at risk' [of extirpation] by either the federal or provincial government.

**Federally listed:** The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) maintains a list of species that are designated as Extirpated, Endangered, Threatened, or of Special Concern. Those species listed by the *Species at Risk Act* are protected on federal lands.

**Endangered:** A species facing imminent extirpation (local extinction) or extinction.

**Threatened:** A species likely to become endangered if limiting factors are not reversed.

**Special Concern:** A species of special concern because of characteristics that make it particularly sensitive to human activities or natural events.

**Not at Risk:** A species that has been evaluated and found to be not at risk.

**Not Listed:** A species for which there is no present need for evaluation.

**Provincially ranked:** The British Columbia government maintains a ranking of species considered to be Red-listed, Blue-listed, and Yellow-listed in the province. Yellow-listed species are not at risk. Species at risk can now be listed under the *Wildlife Amendment Act 2004*.





**Red-listed:** includes any indigenous species or subspecies that have, or are candidates for, Extirpated, Endangered, or Threatened status in British Columbia. Extirpated taxa no longer exist in the wild in British Columbia, but do occur elsewhere. Endangered taxa are facing imminent extirpation or extinction. Threatened taxa are likely to become endangered if limiting factors are not reversed. Not all Red-listed taxa will necessarily become formally designated. Placing taxa on these lists flags them as being at risk and requiring investigation.

**Blue-listed:** includes any indigenous species or subspecies considered to be of Special Concern (formerly Vulnerable) in British Columbia. Taxa of Special Concern have characteristics that make them particularly sensitive or vulnerable to human activities or natural events. Blue-listed taxa are at risk, but are not Extirpated, Endangered or Threatened.

**Yellow-listed:** includes species that are apparently secure and not at risk of extinction. Yellow-listed species may have red- or blue-listed subspecies.



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## Additional Information Sources

Some additional management, conservation, and educational resources are listed below.

### Habitat Management and Guidelines

Bald Eagle Habitat Management Guidelines. Ontario Ministry of Natural Resources <http://www.ontla.on.ca/library/repository/mon/6000/10299737.pdf>

Bald Eagle Information (US Fish & Wildlife Service) [https://ecos.fws.gov/species\\_profile/SpeciesProfile?spcode=B008](https://ecos.fws.gov/species_profile/SpeciesProfile?spcode=B008)

Best Management Practices for Wildlife and Others in Ontario <http://www.omafra.gov.on.ca/english/environment/bmp/wild.htm>

Develop with Care 2012: Environmental Guidelines for Urban and Rural Land Development in British Columbia <http://www.env.gov.bc.ca/wld/documents/bmp/devwithcare2012/index.html>

Glossary of Terms; B.C. Ministry of Forests <http://www.for.gov.bc.ca/hfd/library/documents/glossary/>

Guidelines and Best Management Practices in British Columbia (link to multiple guideline documents) <http://www.env.gov.bc.ca/wld/BMP/bmpintro.html>

Habitat Management Guidelines for Ontario's Forests Nesting Accipiters, Buteos and Eagles <http://www.ontla.on.ca/library/repository/mon/6000/10299745.pdf>

Habitat Management: Enhancing Wildlife Habitat on Farmlands (Ohio) <http://ohioline.osu.edu/wfact/0014.html>

Habitat Management: Practices for Enhancing Wildlife Habitat (Pennsylvania) <http://pubs.cas.psu.edu/FreePubs/pdfs/uh107.pdf>

About Hawks, Owls and Other Raptors (Alberta) <http://www.srd.alberta.ca/FishWildlife/HumanWildlifeConflict/HawksOwlsRaptors.aspx>

Accounts and Measures for Managing Identified Wildlife under the Forest and Range Practices Act (birds) [http://www.env.gov.bc.ca/wld/frpa/iwms/accounts.html#seventh\\_](http://www.env.gov.bc.ca/wld/frpa/iwms/accounts.html#seventh_)

Land Use in the Vicinity of Airports (Transport Canada) <http://www.tc.gc.ca/eng/civilaviation/publications/tp1247-menu-1418.htm>

Management Recommendations for Washington's Priority Species, Volume IV: Birds <http://wdfw.wa.gov/hab/phs/vol4/birdrecs.htm>

Natural Heritage Systems in Urban Settings [http://www.toronto.ca/moraine/pdf/natural\\_heritage\\_systems\\_urbanizing\\_settings.pdf](http://www.toronto.ca/moraine/pdf/natural_heritage_systems_urbanizing_settings.pdf)





## Inventory

Inventory: Avian Inventory and Monitoring Protocols <http://www.parks.ca.gov/pages/734/files/imap%20bird%20protocol%20table%20.pdf> (see pages 3-5)

Inventory: B.C. Inventory Methods for Raptors [http://www.ilmb.gov.bc.ca/risc/pubs/tebiodiv/raptors/version2/rapt\\_ml\\_v2.pdf](http://www.ilmb.gov.bc.ca/risc/pubs/tebiodiv/raptors/version2/rapt_ml_v2.pdf)

Species and Ecosystem Explorer (B.C.) <http://www.env.gov.bc.ca/atrisk/toolintro.html>

## Raptors (General)

Bibliography of Raptors and Humans <http://users.cybercity.dk/~ccc12787/bibacci/raptorandman.html>

Canadian Raptor Conservancy <http://www.canadianraptorconservancy.com/>

Managing Breeding Raptors in the Cariboo Forest Region: A Case Study of the Alex Fraser Research Forest. Laura K Smith, R.P.F. <http://afrf.forestry.ubc.ca/files/2012/03/Raptor-Full-Report.pdf>

Raptor Bibliography (search catalog for 'raptor') <http://www.calacademy.org/research/library/biodiv/biblio/raptor.htm>

Raptor Identification (Patuxent Center) <http://www.mbr-pwrc.usgs.gov/id/fram1st/infocenter.html>

Raptor Research Reports (Raptor Research Foundation) <http://www.raptorresearchfoundation.org/publications/raptor-research-reports>

Raptor Research and Management Techniques. David M. Bird and Keith L. Bildstein (Eds.) 2007. [http://raptors.hancockwildlife.org/filemgmt\\_data/files/Raptor\\_Research\\_all.pdf](http://raptors.hancockwildlife.org/filemgmt_data/files/Raptor_Research_all.pdf)

## Raptors and Pesticides

American Bird Conservancy, Pesticides and Birds <http://www.abcbirds.org/abcprograms/policy/toxins/pesticides.html>

Minnesota Department of Agriculture Voluntary Pesticide Best Management Practices <http://www.mda.state.mn.us/protecting/bmps/voluntarybmps.aspx>

Impact of Agricultural Pesticides on Birds of Prey in the Lower Fraser Valley [http://research.rem.sfu.ca/downloads/frap/S\\_48.pdf](http://research.rem.sfu.ca/downloads/frap/S_48.pdf)

## Raptors and Powerlines

Edison Electrical Institute Avian Protection Plan Guidelines <http://eei.org/ourissues/TheEnvironment/Land/Documents/AvianProtectionPlanGuidelines.pdf>

Edison Electrical Institute, Promoting Compatibility between Birds and Power Lines <http://eei.org/ourissues/TheEnvironment/Land/Pages/WildlifeEndangeredSpecies.aspx>



## Raptors and the West Nile Virus

Delaware Valley Raptor Centre <http://www.dvrconline.org/WestNileVirus.html>

## Raptors and Wind Power Facilities

National Wind Coordinating Collaborative <http://www.nationalwind.org/>

National Wind Coordinating Collaborative Wildlife Workgroup <http://www.nationalwind.org/issues/wildlife.aspx>

Raptors (Alberta Government site: Hawks, Owls, and Raptors)) <http://www.srd.alberta.ca/FishWildlife/HumanWildlifeConflict/HawksOwlsRaptors.aspx>

Raptors (and Other Wildlife; Manitoba Government site) <http://www.gov.mb.ca/conservation/wildlife/managing/index.html>

Recommendations for protecting raptors from human disturbance. Cary T. Richardson and Clinton K. Miller. 1997. Wildlife Society Bulletin 1997, 25(3):634-638. <http://www.cosb.us/Solargen/feir/v2/b026refs/Richardson%20and%20Miller%201997%20Reccomendations%20for%20protecting%20ra.pdf>

## Species

Cornell Lab of Ornithology All About Birds website <http://www.allaboutbirds.org/guide/search.aspx>

### Hawks

Hawk Information: Links to many different publications and reports <http://www.hawkwatch.org/conservation-science/publications-and-reports>

Hawk Information: Northern Prairie Wildlife Research Centre [http://www.npwrc.usgs.gov/resource/taxa\\_n.htm](http://www.npwrc.usgs.gov/resource/taxa_n.htm)

Hawkwatch International: Comprehensive Information on Hawks <http://www.hawkwatch.org/>

### Owls

Owls: General Information <http://www.owlpages.com/>; <http://www.rci.rutgers.edu/~au/owl.htm>

Owls of North Dakota <http://www.npwrc.usgs.gov/resource/birds/owls/index.htm>

Biology and conservation of owls of the Northern Hemisphere <http://www.ncrs.fs.fed.us/pubs/gtr/other/gtr-nc190/toc.html>

Barn Owl (Status in Canada) [http://www.sararegistry.gc.ca/species/speciesDetails\\_e.cfm?sid=44](http://www.sararegistry.gc.ca/species/speciesDetails_e.cfm?sid=44)

Flammulated Owl (Status in Canada) [http://www.sararegistry.gc.ca/species/speciesDetails\\_e.cfm?sid=48](http://www.sararegistry.gc.ca/species/speciesDetails_e.cfm?sid=48)



Short-eared Owl (Status in Canada) [http://www.sararegistry.gc.ca/species/speciesDetails\\_e.cfm?sid=60](http://www.sararegistry.gc.ca/species/speciesDetails_e.cfm?sid=60)

Spotted Owl Information (US Fish & Wildlife Service) [https://ecos.fws.gov/species\\_profile/SpeciesProfile?spcode=B08B](https://ecos.fws.gov/species_profile/SpeciesProfile?spcode=B08B)

Spotted Owl (Status in Canada) [http://www.sararegistry.gc.ca/species/speciesDetails\\_e.cfm?sid=33](http://www.sararegistry.gc.ca/species/speciesDetails_e.cfm?sid=33)

Western Screech-owl (*macfarlanei* and *kennicottii* subspecies status in Canada)

[http://www.sararegistry.gc.ca/species/speciesDetails\\_e.cfm?sid=720](http://www.sararegistry.gc.ca/species/speciesDetails_e.cfm?sid=720)

[http://www.sararegistry.gc.ca/species/speciesDetails\\_e.cfm?sid=719](http://www.sararegistry.gc.ca/species/speciesDetails_e.cfm?sid=719)

### **Osprey**

Forest Management Guide for the Protection of Osprey Nests in Ontario [http://www.mnr.gov.on.ca/stdprodconsume/groups/lr/@mnr/@forests/documents/document/mnr\\_e000512.pdf](http://www.mnr.gov.on.ca/stdprodconsume/groups/lr/@mnr/@forests/documents/document/mnr_e000512.pdf)

Building Nesting Platforms for Ospreys (Ontario) [http://www.lrconline.com/Extension\\_Notes\\_English/pdf/ospry.pdf](http://www.lrconline.com/Extension_Notes_English/pdf/ospry.pdf)

### **Northern Goshawk**

Recovery Strategy for the Northern Goshawk, *laingi* subspecies (*Accipiter gentilis laingi*) in British Columbia [http://www.env.gov.bc.ca/wld/documents/recovery/rcvrystrat/northern\\_goshawk\\_rcvry\\_strat\\_200508.pdf](http://www.env.gov.bc.ca/wld/documents/recovery/rcvrystrat/northern_goshawk_rcvry_strat_200508.pdf)

Stuart-Smith, A.K., W.L. Harrower, T. Mahon, E.L. McClaren, & F. I. Doyle. 2012. A scientific basis for managing northern goshawk breeding areas in the Interior of British Columbia: Best management practices. FORREX Forum for Research and Extension in Natural Resources, Kamloops, B.C. FORREX Series 29. [http://www.forrex.org/sites/default/files/forrex\\_series/176-goshawk-final.pdf](http://www.forrex.org/sites/default/files/forrex_series/176-goshawk-final.pdf)

### **Peregrine Falcon**

Monitoring Plan for the American Peregrine Falcon <http://library.fws.gov/pubs1/peregrine03.pdf>

Peregrine Falcon (*anatum* and *pealei* Subspecies Status in Canada) [http://www.sararegistry.gc.ca/species/speciesDetails\\_e.cfm?sid=29](http://www.sararegistry.gc.ca/species/speciesDetails_e.cfm?sid=29); [http://www.sararegistry.gc.ca/species/speciesDetails\\_e.cfm?sid=54](http://www.sararegistry.gc.ca/species/speciesDetails_e.cfm?sid=54)

Urban Habitats Journal, Birds in the Urban Environment <http://www.urbanhabitats.org/v03n01/>



## Appendix A: Legislation

This information is based on a cursory review of relevant legislation concerning raptors and their habitat and does not represent a legal interpretation or opinion. For legal purposes, the reader must seek legal counsel and/or the official legislation.

### Provincial Legislation

**British Columbia Wildlife Act** [http://www.bclaws.ca/EPLibraries/bclaws\\_new/document/ID/freeside/00\\_96488\\_01](http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/00_96488_01)

The British Columbia *Wildlife Act* was designed to help protect and manage wildlife in British Columbia. Although most species of wildlife are included in this Act, marine mammals are not. All native birds described in the American Ornithologists Union Checklist of North American Birds, 7th Edition or its supplements, and all migratory game birds covered by the federal *Migratory Birds Convention Act* are covered by this Act. In addition, some non-native species are included. This includes non-native upland game birds introduced for hunting, all raptor species imported for falconry purposes, and some nuisance alien species designated as wildlife to enable their management and control.

The *Wildlife Act* has the power to designate [Wildlife Management Areas](#). The Minister may by regulation designate land as a [Critical Wildlife Management Area](#) for threatened or endangered species. If the Lieutenant Governor in Council considers that a species of wildlife is threatened with imminent extinction throughout all or a significant portion of its range in British Columbia because of the actions of humans, the Lieutenant Governor in Council may, by regulation designate the species as an endangered species. Note that there are presently four species classified as endangered under the Act, including one raptor—the Burrowing Owl. By the same method, if the Lieutenant Governor in Council considers that a species of wildlife is likely to become endangered in British Columbia, the Lieutenant Governor in Council may designate the species a threatened species.

A person that alters, destroys, or damages wildlife habitat, or deposits on land or water a substance or manufactured product or by product in a manner that is harmful to wildlife or wildlife habitat that person commits an offence under the *Wildlife Act*. Under the *Wildlife Act* ([Section 7\(4\)](#)), a regional manager may make orders prohibiting a person from:

“entering, cutting, picking, removing, altering, destroying or damaging vegetation in, disturbing or harassing wildlife in, releasing or abandoning an animal in, and allowing an animal to enter a wildlife management area, a critical wildlife area or a wildlife sanctuary.”

A person who contravenes an order made under this subsection commits an offence.



[Section 34](#) of the *Wildlife Act* is specific to birds and states that:

“A person commits an offence if the person, except as provided by regulation, possesses, takes, injures, molests or destroys:

- a) a bird or its egg,
- b) the nest of an eagle, peregrine falcon, gyrfalcon, osprey, heron or burrowing owl, or
- c) the nest of a bird not referred to in paragraph (b) when the nest is occupied by a bird or its egg.”

Thus, all birds designated as wildlife under the *Wildlife Act* are protected and this protection is extended to their eggs, chicks and nests. All bird nests are protected when active/occupied, and Subsection 34 extends this protection year-round to a select few species including six species of raptor: Golden Eagles, Bald Eagles, Ospreys, Peregrine Falcons, Gyrfalcons, and Burrowing Owls. This protection extends automatically to the structure holding the nest (often a tree) as obviously disturbance to/destruction of the structure would result in similar effects on the nest and its contents. Further extension to surrounding habitat is not mentioned, but this does not mean that no protection exists as disturbance/destruction of immediately adjacent habitat that results in abandonment or destruction of a nest could be construed as a violation of Section 34. Each situation is different and therefore must be evaluated separately. Some species are more sensitive to disturbance than others, and even within species, birds choosing to nest in urban areas show much more tolerance to disturbance than those nesting in more remote areas. Thus, involvement of qualified professional and consultation/evaluation on a site-by-site basis is often required to demonstrate due diligence and provide an appropriate buffer if necessary.

Specific habitat protection under the *Wildlife Act* occurs for areas set aside as Wildlife Management Areas, Critical Wildlife Areas or Wildlife Sanctuaries. Except as permitted, statutes under Section 7 of the Act make it an offence to alter, destroy or damage wildlife habitat. Furthermore, it is an offence to deposit on land or water a substance or manufactured product or by-product in a manner that is harmful to wildlife or wildlife habitat in a wildlife management area. Additionally, it is an offence to enter, cut, pick, remove, alter, destroy or damage vegetation, or to disturb or harass wildlife, release or abandon an animal in, or allow an animal to enter a wildlife management area, a critical wildlife area or a wildlife sanctuary.

Another section of the *Wildlife Act* that has the potential to protect wildlife is Section 75; Accidental Killing of Wildlife. [Section 75](#) states that:

“A person commits an offence if the person:

kills or wounds wildlife, other than prescribed wildlife, by accident or for the protection of life or property, and

does not report promptly to an officer the killing or wounding and the location of the wildlife.”





Note that Section 34 of the Act states that, unless a permit is obtained in advance, it is illegal to kill or trap a raptor on your property. Depending on the offence, various penalties and fines may be imposed for offences under the *Wildlife Act* or a regulation under the Act.

**Forest and Range Practices Act** [http://www.bclaws.ca/EPLibraries/bclaws\\_new/document/ID/freeside/00\\_02069\\_01](http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/00_02069_01)

For non-protected (i.e., non park) areas where industrial forestry is prevalent, the *Forest and Range Practices Act* provides for varying degrees of raptor habitat conservation. These include the [Identified Wildlife Management Strategy](#) and [General Wildlife Measures](#). The Identified Wildlife Management Strategy allows for the creation of Wildlife Habitat Areas (WHAs). WHAs are usually small (i.e., typically <50 ha) areas of limiting habitat that have been mapped and approved by the chief forester and the Minister responsible for jurisdiction of the *Wildlife Act* or their delegate. However, they can be large for some species such as the Northern Goshawk and Marbled Murrelet (hundreds of hectares). WHAs are designed to minimize disturbance or habitat alteration to a species' limiting habitat or to a rare plant community. Some WHAs have a single level of protection, while others consist of a core area that is protected from habitat alteration and a buffer to minimize other disturbance. The Act provides for Identified Wildlife and General Wildlife Measures under [Operational Planning Regulations](#). The net result is the establishment of a management practice that applies within a specified ecosystem unit as a general wildlife measure where necessary to maintain a specified habitat.

**Ecological Reserve Act** [http://www.bclaws.ca/EPLibraries/bclaws\\_new/document/ID/freeside/00\\_96103\\_01](http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/00_96103_01)

**Protected Areas of British Columbia Act** [http://www.bclaws.ca/EPLibraries/bclaws\\_new/document/ID/freeside/00017\\_00](http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/00017_00)

**Park Act** [http://www.bclaws.ca/EPLibraries/bclaws\\_new/document/ID/freeside/00\\_96344\\_01](http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/00_96344_01)

These acts as well as associated pieces of legislation (e.g., [Ecological Reserve Regulations](#), [Application of Park Legislation to Ecological Reserves Regulation](#)) serve to create and protect significantly important ecological sites that are located on Crown land (terrestrial or submarine). This Act provides very strong legal protection because the Act and regulations and orders made under it prevail over all other provincial legislation. For matters requiring cooperation between federal and provincial agencies, BC Parks will coordinate provincial participation.

Ecological Reserves are established through publication of a notice in the B.C. Gazette by the Minister responsible. The purpose of the *Ecological Reserve Act* is to reserve Crown land for ecological purposes including the following areas:

- “areas suitable for scientific research and educational purposes associated with studies in productivity and other aspects of the natural environment;
- areas that are representative examples of natural ecosystems in British Columbia;



areas that serve as examples of ecosystems that have been modified by human beings and offer an opportunity to study the recovery of the natural ecosystem from modification;

areas where rare or endangered native plants and animals in their natural habitat may be preserved; and

areas that contain unique and rare examples of botanical, zoological or geological phenomena.”

The Ecological Reserve Regulations strictly regulate human activities in Ecological Reserves. Section 1 of the regulations state that

“no person shall enter upon an ecological reserve for a purpose inconsistent with the *Ecological Reserve Act*, and without limiting the generality of the foregoing, no person shall prospect for minerals, cut timber, allow domesticated animals to graze, camp, light fires, trap or molest animals, build roads or trails, use motorized vehicles within an ecological reserve, or remove plants, animals or material from an ecological reserve.”

Permits may be authorized for research or educational purposes. Permits may be cancelled or modified by the administrator when he considers such action advisable. Persons that commit an offence under the regulations are punishable by fine. The *Ecological Reserve Act* and related legislation has powers to protect wildlife as it is expressly stated that no person may molest animals in an Ecological Reserve. “Molestation of animals” is not defined in the Act.

**Environment and Land Use Act** [http://www.bclaws.ca/EPLibraries/bclaws\\_new/document/ID/freeside/00\\_96117\\_01](http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/00_96117_01)

The *Environment and Land Use Act* allows the provincial government to customize land use regimes to meet particular objectives. It is used when the government wants to formally designate areas where the desired management objectives do not neatly fit into any of the other designations available. This is strong legislation that makes it relatively easy for the province to be flexible and adaptive to local situations that are not easy to manage under other legislation.



## Federal Legislation

### **Migratory Bird Convention Act** <http://laws-lois.justice.gc.ca/eng/acts/M-7.01/>

This legislation governs the 1916 Migratory Birds Convention, which was designed to protect and manage migratory bird species that used habitats in both Canada and the United States and was revised in 1994. The following species are covered by the Act: waterfowl; cranes; rails and coots; shorebirds, including gulls and terns; pigeons and doves; insectivorous songbirds (excluding blackbirds); seabirds; loons; grebes; herons, egrets and bitterns. While, generally speaking, this Act is considered to supersede the *Wildlife Act* for species that appear on both, it does not cover raptors, which only receive federal protection if they become covered by the *Species at Risk Act* (see below).

### **Species at Risk Act** <http://laws-lois.justice.gc.ca/eng/acts/S-15.3/>

The purpose of the *Species at Risk Act* is:

“to prevent Canadian indigenous species, subspecies and distinct populations of wildlife from becoming extirpated or extinct, to provide for the recovery of endangered or threatened species and to encourage the management of other species to prevent them from becoming at risk.”

This enactment established the [Committee on the Status of Endangered Wildlife in Canada](#) (COSEWIC) as an independent body of experts responsible for assessing and identifying species at risk. It provides that COSEWIC’s assessments are to be reported to the federal Minister of the Environment and to the Canadian Endangered Species Conservation Council and it authorizes the Governor in Council to establish by regulation the official list of species at risk based on that process. It requires that the best available knowledge be used to define long- and short-term objectives in a recovery strategy for endangered and threatened species and it provides for action plans to identify specific actions. It creates prohibitions to protect listed, threatened, and endangered species and their critical habitat. It recognizes that compensation may be needed to ensure fairness following the imposition of the critical habitat prohibitions. It creates a public registry to assist in making documents under the Act more accessible to the public. It is consistent with Aboriginal and treaty rights and respects the authority of other federal ministers and provincial governments.

The *Species at Risk Act* aims to protect threatened species and their habitats by using species assessments from COSEWIC to determine which species are threatened. The Act sets out the process whereby COSEWIC will classify species in Canada and the other duties of COSEWIC. Recovery strategies and action plans will be developed for species that are considered to be endangered, threatened, or extirpated. Management plans will be developed for species of special concern. Critical habitats for these species will be identified.



General prohibitions ([Section 32](#)) of the Act specify that:

“(1) No person shall kill, harm, harass, capture or take an individual of a wildlife species that is listed as an extirpated species, an endangered species or a threatened species.

(2) No person shall possess, collect, buy, sell or trade an individual of a wildlife species that is listed as an extirpated species, an endangered species or a threatened species, or any part or derivative of such an individual.

(3) For the purposes of subsection (2), any animal, plant or thing that is represented to be an individual, or a part or derivative of an individual, of a wildlife species that is listed as an extirpated species, an endangered species or a threatened species is deemed, in the absence of evidence to the contrary, to be such an individual or a part or derivative of such an individual.”

[Section 33](#) states that:

“No person shall damage or destroy the residence of one or more individuals of a wildlife species that is listed as an endangered species or a threatened species, or that is listed as an extirpated species if a recovery strategy has recommended the reintroduction of the species into the wild in Canada.”

Species of concern are listed in three schedules within the Act depending on the time frame that COSEWIC has to finalize its evaluation of the conservation status of the species. The Act will be enforced by officers designated by the Minister. Contravention of the Act by persons or corporations is punishable by fines and imprisonment.



# Appendix B: Raptor Webcam Guidelines

## 1. Introduction

### 1.1 Purpose

This appendix provides guidance on how to install and use webcams at raptor nests in British Columbia in an effective, ethical, and biologically sound way.

The guidelines were created to address issues regarding webcam installation; however, they may be adapted and applied to other forms of audio-visual wildlife surveillance equipment as they are deployed.

### 1.2 How to Use the Guidelines

While the following document represents a relatively comprehensive list of guidelines, it is not exhaustive and it is likely that other issues may arise and need to be added if the use of webcams and associated human disturbance increases. Webcam installers maintaining and submitting records on nest success/failure can also provide useful information that will assist in guideline amendments and future decision making.

Note also that some issues are interrelated; for instance, distance from the nest is of far greater importance at an occupied nest than during the period when the nest is vacated. The distances and dates suggested have been drafted in accordance with the precautionary principle and thus if followed, should avoid nest abandonment and undue disturbance throughout the province. It may be feasible to make minor adjustments to them, but this should only be done following consultation with an appropriately qualified professional such as a [Registered Professional Biologist](#) with expertise in raptors or a qualified staff person (species at risk or raptor specialist) from the Provincial Government.

We encourage users of these guidelines to submit their suggestions for improvements to the guidelines.

### 1.3 Background

At one time, the use of webcam technology was largely limited to being a component of a scientific research project that usually required acquisition of a permit and/or [Animal Care Committee](#) approval. Technological advances now make it possible for private citizens to install webcams at raptor nests. This can be done at nests on their own property, on someone else's property at the landowner's request, or on Crown land, all without the need for a permit. The placement of a webcam at a raptor nest has the potential to disturb the birds during the actual installation and/or during ongoing webcam maintenance. It should be noted that different raptors in different areas respond differently to various levels of human disturbance. In the case of webcam installation, the concern is not so much the presence of the webcam



itself, but rather the potential disturbance to the birds from human activity at or above the nest. In a worst case scenario, this may lead to abandonment of the site or premature fledging of immature birds. Provincial government staff have received a number of public complaints/concerns regarding these activities, as well as requests for guidance/permits from people wanting to install them. The Province has created these guidelines to address our responsibilities under the [Wildlife Act](#) to protect the birds, their young and nests, while at the same time avoiding the implementation of legislative requirements which may prove unnecessary. The effectiveness of these guidelines will be assessed over time, and if need be, regulations enabling the requirement of permits may be considered at a later date.

## 2 Guidelines for Raptor Webcams

Legal requirements relevant to the protection of raptors are outlined in Appendix A.

### 2.1 Guidelines for Professional Reliance

It is recommended that prior to taking any action, citizens desiring to set up a webcam at a raptor nest (even if on their own property) should consult with an appropriately qualified professional who is familiar with the ecology and conservation of the nesting raptor species in question.

### 2.2 Guidelines for Time of Year Considerations

Raptors are most susceptible to disturbance during their breeding seasons. This period varies amongst species as well as with latitude and elevation.

- ☑ Webcams should be installed outside of the breeding/courtship season, especially when intended to be close to the nest.
- ☑ Bald Eagles can be present on their territories almost year-round, particularly in southern B.C. where territorial activity can begin prior to winter, thereby significantly shortening the safe period to install webcams.
- ☑ Attendance of webcams for service or cleaning should be restricted to the access periods stated in the **Recommendations** section below. If there is concern that mechanical breakdown may occur, installers should accommodate this by increasing the number of webcams installed rather than trying to access one at an active nest.
- ☑ The courtship/egg laying/early incubation periods are the most sensitive phases of the breeding season as the birds have less invested in a particular nest site at that time and are more likely to abandon it if disturbed; particularly if the disturbance is at or directly above the nest.
- ☑ Adults have higher nest fidelity and are less likely to desert once young are in the nest. Note, however, that excessive disturbance that occurs any time during the nesting period and doesn't result in immediate abandonment, could result in





avoiding the site in following years.

- ☑ Boreal Owls, Great Horned Owls, and Bald Eagles are the earliest nesters in B.C., with south-coastal birds commonly having eggs in the nest as early as February (see Table 2, page 24).
- ☑ Most raptors have fledged their young by the end of August; however, the Burrowing Owl and Short-eared Owl may still have young at the nest well into September, and Barn Owls may nest at any time of the year (see Table 2, page 24).
- ☑ Generally, the further north and the higher the elevation the later and shorter the breeding period, hence webcam access periods could be extended in northern regions for most species.

### 2.3 Guidelines for Webcam Distance from Nest

Distances will vary depending on time of year, occupancy of the site, location of the camera, and status designation of the bird (see **Guidelines for Status of Species Being Viewed** below).

- ☑ No activities involving webcam installation or maintenance should occur at or directly above tree nests outside of the recommended access periods (see **Guidelines for Time of Year Considerations** above),
- ☑ At inactive nests or within the recommended access periods, they can be installed in the nest tree, but should not impact the nest structure. In general, the nest and the tree should not be altered in any way to improve the “view” as this may make the nest more susceptible to inclement weather and/or predation (see **Guidelines for Habitat Alteration During Webcam Installation** below).
- ☑ At tree nests, cameras should not be affixed to the nest itself, but rather to the trunk or a sturdy branch. Wide angle lens, single focus cameras need to be close to the edge of the nest – the smaller the camera the better. Cameras with an adjustable focus should be situated further away and moving parts should be hidden from the bird’s view.
- ☑ In some situations, consideration of distance may not be necessary, even if the camera is set up during the breeding season (e.g., installing a webcam in a building across a road from the nest).



## 2.4 Guidelines for Status of Species Being Viewed

Greater precautions need to be taken in the case of raptors with at-risk status.

- ☑ The [Conservation Data Centre Species and Ecosystems Explorer](#) website should be checked to confirm the provincial and/or federal listing status of the raptor in question.
- ☑ Species/taxa that are Threatened or Endangered nationally or provincially, and/or on the provincial Red List are of the highest concern; followed by those that are Special Concern/Blue-listed.
- ☑ In general, with the potential exception of raptors nesting on human-made structures and/or as part of a valid scientific research study, webcams should not be used at the nests of species at risk.
- ☑ Species/taxa determined to be not at-risk provincially (Yellow-listed) have the lowest conservation concern, but some of may have a high public profile due to media coverage and/or have large, easily visible nests and well-known nests (e.g., Bald Eagles, Ospreys). This should be taken into consideration when selecting a nest site to avoid potential public concern.

## 2.5 Guidelines for Location of Webcam

The relative locations of the webcam and the raptor nest are extremely important factors to consider prior to installing a webcam.

- ☑ Federal, provincial and municipal laws regarding tree, bird, “residence”, and nest protection should be checked before proceeding.
- ☑ Setting up a webcam for a species at risk at a non-natural site (e.g., urban peregrines nesting on a building or bridge), may be acceptable; whereas, doing this at a wild eyrie on a cliff may not be.
- ☑ Raptors habituated to human presence are often more tolerant of human activity below the nest than those in rural or wilderness situations; e.g., Bald Eagles in urban settings are able to withstand much more disturbance than in wilderness settings. However, even the most habituated urban raptors will not tolerate human disturbance in or directly above their nests.
- ☑ Some nest boxes and nest ledges are built expressly to contain surveillance equipment for research purposes.
- ☑ Setting up a webcam in the interior of a building across the street from a nest would likely be of no concern, regardless of whether the nest was active or not, or whether the species was at-risk. On the other hand, setting up a webcam close to the active nest of a species at risk should not be attempted.
- ☑ Well-known, publicly viewed sites (e.g., long-term active sites in public parks) may warrant consideration for greater restrictions to alleviate potential public concern.



## 2.6 Guidelines for Webcam Maintenance Activities

Care must be taken to ensure that the equipment installed, particularly the wiring and its placement, does not pose a threat to the birds or the public.

- ☑ Consideration of and planning for maintenance activities should be made in advance of installation in order to avoid disturbance outside of the recommended access periods (see **Guidelines for Time of Year Considerations** above). Only equipment that does not need attendance outside of the recommended access period should be installed at the nest site (i.e., in the nest tree). Equipment requiring servicing outside of the recommended access periods should only be installed at locations/distances safely away from the nest (see **Guidelines for Webcam Distance from Nest** above).
- ☑ The equipment used should be designed and installed such that some post set-up activities are not required during the breeding season as this would involve human presence at the nest and disturbance of the birds (e.g., manually adjusting the camera or its location, changing/retrieving the film, replacing batteries, etc.).
- ☑ If mechanical breakdown is a concern, installers should accommodate this by increasing the number of webcams installed rather than trying to access one at an active nest. This can be done by either installing webcams at multiple sites, or by having more than one installed at a particular site.

## 2.7 Guidelines for Habitat Alteration During Webcam Installation

Alterations to the habitat around the nest to assist installation of a webcam could change the microclimate and cover properties of the nest area which could result in desertion or increased predation.

- ☑ No alterations should be made to an existing nest tree, ledge, nest box or cavity for the placement of the camera equipment or for opening a viewing lane to the nest.
- ☑ It may be acceptable to make minor alterations to a nearby tree or other vegetation to assist placement of the camera, but not if such changes would adversely impact the nest site.
- ☑ If a situation exists where removal of a nest tree branch may seem appropriate (perhaps improving access to the nest for the bird), an appropriately qualified professional familiar with the species should be consulted before doing so.
- ☑ Nest cliffs should not be altered to accommodate webcams.
- ☑ In some cases, webcams may be placed in buildings or other human-made structures. Where the nest is in a tree or on a cliff adjacent to the structure, alterations can be made to the structure to accommodate the camera in



accordance with the owner's permission. If the nest is on the structure (e.g., urban peregrines), no alterations should be made that would adversely impact the microclimate and cover properties of the nest area.

## 2.8 Guidelines for Nest Interference

It is recommended that webcam installers and property owners let nature take its course and do not interfere with the natural events that take place at the nest.

- ☑ Proponents of webcams and their viewers may be unaware that natural mortality can occur and the nest they are observing may fail. This may result in an interest to take actions that may interfere with the natural process of wild birds' reproductive cycles.
- ☑ One intent of private webcams is to educate the public about the ecology of raptors. This education should include awareness of the real possibility that some or all of the young may not survive, and that this is part of the natural selection process.
- ☑ In general, interference with a raptor's natural breeding activities should be avoided as, while well-intentioned, it may constitute an offence under the *Wildlife Act*.
- ☑ In situations involving widespread "commercial" dissemination of the broadcast where a successful nesting outcome is deemed important, advance consideration should be given to installing multiple webcams at different nests to increase the likelihood that at least one nest will successfully fledge its young.

## 2.9 Guidelines for Injured Birds

Injured adult birds and young birds that fall out of the nest prior to fledging may be candidates for veterinary care and/or rehabilitation.

- ☑ Care should be taken in handling and transporting raptorial birds as they are capable of inflicting injury to themselves and humans.
- ☑ If possible, the nearest permitted wildlife rehabilitation centre or wildlife biologist at the B.C. Ministry of Forests, Lands and Natural Resource Operations regional office should be contacted for instructions and assistance.



### 3. Recommendations

1. For Bald Eagles, the webcam nest access period for webcam installation, maintenance and servicing should be restricted to the months of August and September in southern B.C. and only at sites where the adults left the nest during this period; this period can be extended to include October for the rest of the province.
2. For other raptors, the nest access period for webcam installation, maintenance and servicing should be from October 1st to December 31st.
3. For installation outside these time periods at active/occupied nests, cameras should be installed outside the minimum buffers recommended in **Table 6** of the Guidelines.
4. An appropriately qualified professional familiar with the species in question should be consulted if variances to these recommendations or alteration to nest habitat are to be considered.