

Recovery Strategy for the White-headed Woodpecker (*Picoides albolarvatus*) in Canada

White-headed Woodpecker



2011

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For copies of the recovery strategy, or for additional information on species at risk, including COSEWIC Status Reports, residence descriptions, action plans, and other related recovery documents, please visit the Species at Risk (SAR) Public Registry (www.sararegistry.gc.ca).

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[Proposition] »

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PREFACE

The federal, provincial, and territorial government signatories under the Accord for the Protection of Species at Risk (1996) agreed to establish complementary legislation and programs that provide for effective protection of species at risk throughout Canada. Under the *Species at Risk Act* (S.C. 2002, c.29) (SARA), the federal competent ministers are responsible for the preparation of recovery strategies for listed Extirpated, Endangered, and Threatened species and are required to report on progress within five years.

The Minister of the Environment is the competent minister for the recovery of the White-headed Woodpecker and has prepared this strategy, as per section 37 of SARA. It has been prepared in cooperation with the Province of British Columbia and as per section 39(1) of SARA.

Success in the recovery of this species depends on the commitment and cooperation of many different constituencies that will be involved in implementing the directions set out in this strategy and will not be achieved by Environment Canada, or any other jurisdiction alone. All Canadians are invited to join in supporting and implementing this strategy for the benefit of the White-headed Woodpecker and Canadian society as a whole.

This recovery strategy will be followed by one or more action plans that will provide information on recovery measures to be taken by Environment Canada and other jurisdictions and/or organizations involved in the conservation of the species. Implementation of this strategy is subject to appropriations, priorities, and budgetary constraints of the participating jurisdictions and organizations.

ACKNOWLEDGMENTS

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EXECUTIVE SUMMARY

White-headed Woodpecker (*Picoides albolarvatus*) is a small black woodpecker (21-23cm long) with a white head and white wing patches. The only other bird with which it can be confused is the Clark's Nutcracker (*Nucifraga Columbiana*), which is a larger bird (30-34cm) with a light grey head and body with black wings and white wing patches. White-headed Woodpeckers are dependent on mature and old Ponderosa Pine (*Pinus ponderosa*) for both food (seeds) and nesting cavities.

White-headed Woodpeckers in Canada are found at the northern periphery of their range in the southern Okanagan Valley, British Columbia up to 100 km from the border with the United States. They are non-migratory and are currently at extremely low population levels in Canada. This species was listed as Endangered under the *Species at Risk Act* in 2003.

Loss of snags and mature Ponderosa Pine trees due to forestry practices in Canada in the early 1900s, and in the adjacent United States, is believed to be the primary reason for the decline in the amount of available habitat. Fire suppression has also degraded White-headed Woodpecker habitat and has heightened the risk of catastrophic fire. Pine beetle is an emerging threat that could prove devastating to Ponderosa Pine habitats. Climate change may further increase the severity of fire and pine beetle outbreaks. There are unknowns regarding the feasibility of recovery of White-headed Woodpeckers in Canada; this recovery strategy has been developed to address those unknowns.

The population and distribution objective is to enable a population of White-headed Woodpeckers to exist within historically-occupied habitat. This will require managing suitable or potentially suitable habitat to ensure that continued occupancy can be supported.

Broad strategies to be taken to address the threats to the survival and recovery of the species are presented in the section on Strategic Direction for Recovery.

Due to a lack of information, critical habitat is not identified in this recovery strategy. An action plan will be completed in 2016.

RECOVERY FEASIBILITY SUMMARY

Based on the following four criteria outlined by the Government of Canada (2009), there are unknowns regarding the feasibility of recovery of the White-headed Woodpecker. In keeping with the precautionary principle, a recovery strategy has been prepared as per section 41(1) of SARA, as would be done when recovery is determined to be feasible. This recovery strategy addresses the unknowns surrounding the feasibility of recovery.

- 1. Individuals of the wildlife species that are capable of reproduction are available now or in the foreseeable future to sustain the population or improve its abundance.* Yes, families of White-headed Woodpecker are still being observed, indicating that reproductively capable individuals are available.
- 2. Sufficient suitable habitat is available to support the species or could be made available through habitat management or restoration.* Yes, approximately 40,000 ha of potentially suitable Ponderosa Pine (*Pinus ponderosa*) habitat is still available, despite the considerable impact of historical logging practices and the current Western and Mountain Pine Beetle (*Dendroctonus brevicomis* and *D. ponderosae*) infestations. Much of this area will have to be restored to older age classes (and managed for in-growth) for the recovery of this species to be successful, but this is possible. To date, not much Ponderosa Pine habitat has been permanently lost to development, though houses are starting to be built in this habitat.
- 3. The primary threats to the species or its habitat (including threats outside Canada) can be avoided or mitigated.* Yes, the greatest threats can be mitigated through habitat management. The risk of catastrophic fire and severe pine beetle infestations is lower in more open Ponderosa Pine stands. The large, seed-producing trees required by White-headed Woodpeckers for nesting and foraging are also produced under open stand conditions. There is interest in using mechanical thinning and prescribed burning to open up Ponderosa Pine stands in British Columbia and reduce fuel build-up.
- 4. Recovery techniques exist to achieve the population and distribution objectives, or can be expected to be developed within a reasonable timeline.* While the techniques necessary for habitat restoration exist, it is unknown whether White-headed Woodpeckers will respond favourably to habitat restoration in British Columbia. While evidence from Washington suggests that the species responds positively to restoration treatments (Gaines et al. 2007, 2010), the peripheral nature of the British Columbian population makes it subject to population fluctuations that may be independent of local habitat conditions.

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1. COSEWIC* SPECIES ASSESSEMENT INFORMATION

Date of Assessment: November 2010

Common Name (population): White-headed Woodpecker

Scientific Name: *Picoides albolarvatus*

COSEWIC Status: Endangered

Reason for Designation: In Canada, this distinctive woodpecker breeds only in British Columbia. Its Canadian population is extremely small, likely fewer than 100 individuals. The population is exposed to ongoing threats from habitat loss and degradation. Rescue from the U.S., where populations are sparse, is expected to be limited due to U.S. population declines and restricted remaining habitat in Canada.

Canadian Occurrence: British Columbia

COSEWIC Status History: Designated Threatened in April 1992. Status re-examined and designated Endangered in November 2000 and November 2010.

*Committee on the Status of Endangered Wildlife in Canada

2. SPECIES STATUS INFORMATION

Globally, the rank assigned to the White-headed Woodpecker is G4 (apparently secure; NatureServe 2009). However, within several jurisdictions, the species is listed as vulnerable to critically imperiled (Table 1). Canada represents significantly less than 1% of the global abundance of White-headed Woodpeckers (Partners in Flight 2007).

Table 1. List and description of various conservation status ranks for White-headed Woodpecker (from NatureServe 2009, British Columbia Conservation Data Centre 2009, and British Columbia Conservation Framework 2010).

Global (G) Rank	National (N) Rank	Canada Status	Sub-national (S) Rank	B.C. Conservation Status
G4	Canada: N1 United States: N4	COSEWIC : E (Endangered) SARA : Schedule 1 (Endangered)	British Columbia (S1) Idaho (S2B) Nevada (S2) Oregon (S2S3) Washington (S2S3)	<ul style="list-style-type: none"> • Red List (B.C. CDC) • Identified as a Species at Risk under the <i>Forest and Range Practices Act</i> (FRPA) • Conservation Framework Priority 2 under Goal 3¹

G/N/S1: Critically Imperiled; 2: Imperiled; 3: Vulnerable; 4: Apparently Secure; 5: Secure; SNR: Unranked; SNA: Not Applicable; B: Breeding. BC CDC: British Columbia Conservation Data Centre

¹ Goal 3: Maintain the diversity of native species and ecosystems. Priority 2: second-highest conservation priority. <http://www.env.gov.bc.ca/atrisk/help/consFrwk.htm>

3. SPECIES INFORMATION

3.1 Species Description

White-headed Woodpecker (*Picoides albolarvatus*) is a small (21-23cm long) woodpecker with a small bill. This is the only North American woodpecker with a black body and white head with white wing patches visible when perched. Males have a red patch of feathers at the back of the head. The only other bird with which it could be confused is the Clark's Nutcracker (*Nucifraga columbiana*), which is a larger bird (30-34cm) that has a light grey head and body with black wings and white wing patches. White-headed Woodpeckers are non-migratory, so are present in Canada year-round. White-headed Woodpecker is not a prolific species; breeding pairs produce only one clutch per year of around 4 eggs (Garrett et al. 1996), and do not produce multiple broods even upon nest failure. This inherently limits the population growth of the species.

3.2 Population and Distribution

White-headed Woodpeckers reside year-round in coniferous forests, from the extreme southern interior of British Columbia to southern California (Garrett et al. 1996; Fig. 1).

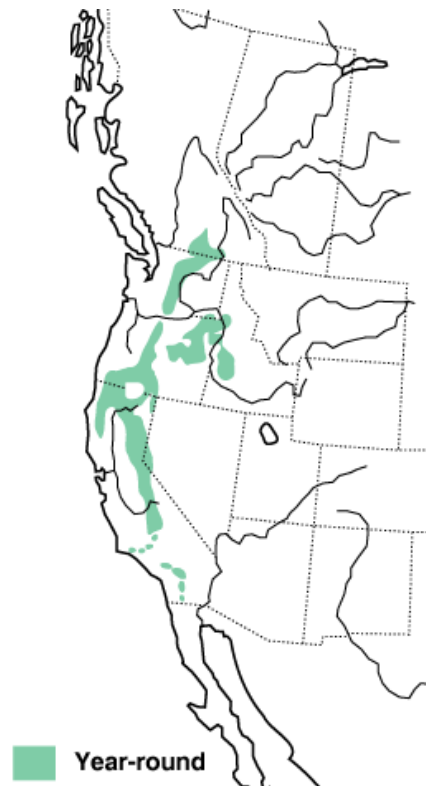


Figure 1. Global range of White-headed Woodpecker. Image courtesy of Birds of North America Online (<http://bna.birds.cornell.edu/bna>) maintained by the Cornell Lab of Ornithology.

In Canada, the White-headed Woodpecker is found only in British Columbia, where it is a very rare resident in the Okanagan Valley from Naramata south, and casual in the Similkameen Valley, Grand Forks area, and the Kootenays (Weber and Cannings 1976; Cannings et al. 1987; Campbell et al. 1990; Figure 2). In the non-breeding season, White-headed Woodpeckers do not migrate, but do move outside of their breeding territories (Garrett et al. 1996). In the northern part of their range (Washington and British Columbia), White-headed Woodpeckers are restricted to forests dominated by Ponderosa Pine. In British Columbia, the species has been detected in Ponderosa Pine-dominated habitats within the Ponderosa Pine, Bunchgrass, Interior Douglas-fir, and Interior Cedar-Hemlock biogeoclimatic zones (B.C. Conservation Data Centre 2009). In the southern part of their range (i.e., California), White-headed Woodpeckers have less strict habitat associations, likely because a greater number of large-seed-producing pine species (e.g., Coulter, Jeffrey and Sugar Pines – *Pinus coulteri*, *P. jeffreyi* and *P. lambertiana*) are available for them to feed on (Cannings 1995).

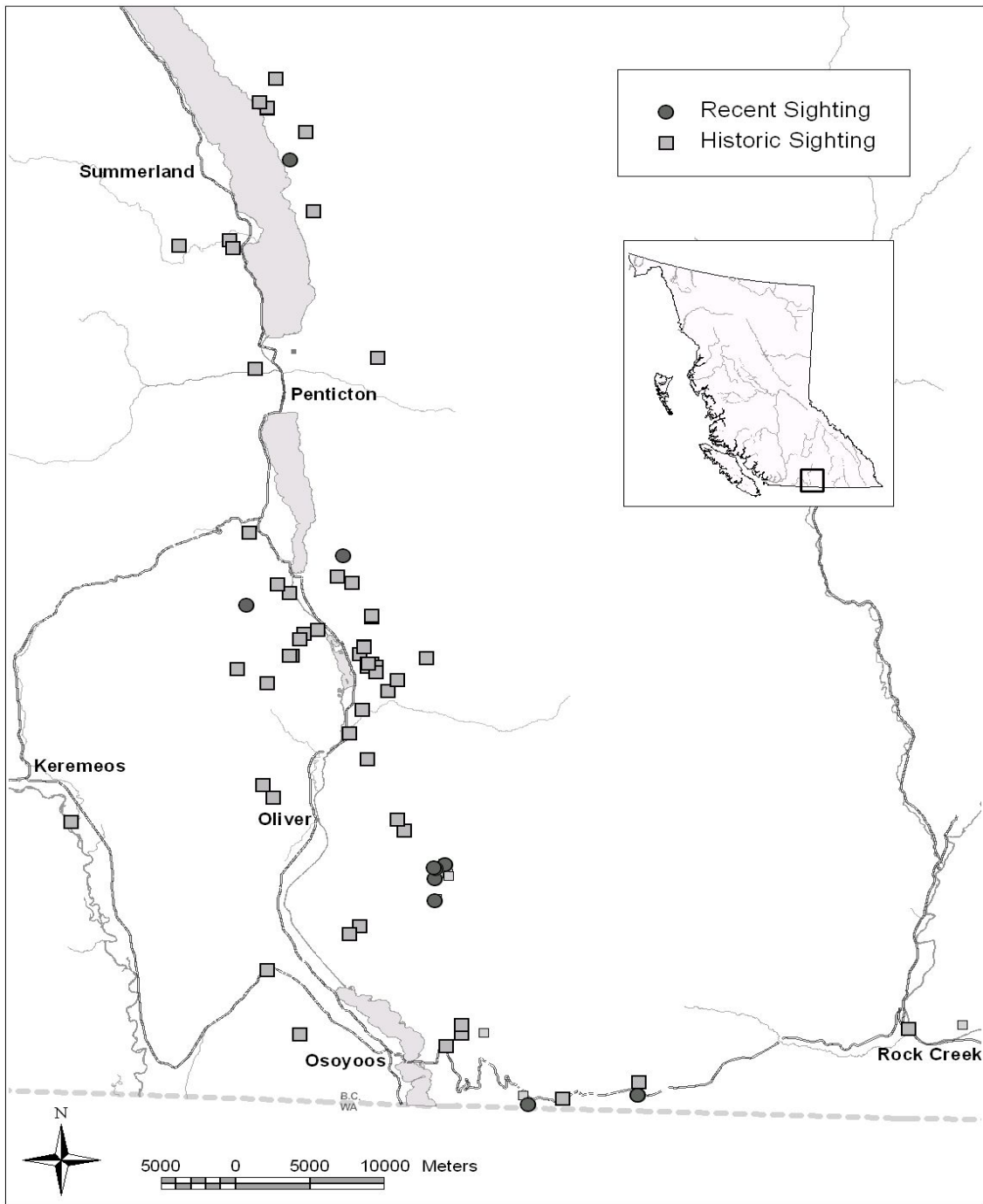


Figure 2. Distribution of White-headed Woodpecker in the South Okanagan-Similkameen region of British Columbia. Recent Sighting = 2000-2010. Historic Sighting = 1952-1999. Image prepared for Environment Canada based on information from the B.C. Ministry of Environment (1952-2002), with additional public sightings (2003-2010) which were reported to the Canadian Wildlife Service.

The global population of White-headed Woodpeckers is estimated at 70,000 individuals (Partners in Flight 2007). COSEWIC (2000) assessed the White-headed Woodpecker as endangered based on very small numbers, a restricted range, and continuing loss in extent and quality of mature Ponderosa Pine habitat. The Canadian population was considered by Cannings (1995) to be “well below 100 individuals” and was more recently estimated by the same author at about 10 individuals (Cannings 2000). White-headed Woodpeckers are difficult to enumerate in Canada for a variety of reasons. First, their breeding territories are large in the northern part of the range (Dixon unpublished data, Dixon 1995 and 1995b), so the same individuals may be counted twice in different areas. Second, the habitat in which they reside is inaccessible and often dangerous to traverse because of cliffs and rocky terrain. Finally, the low density of birds in this problematic terrain adds to the difficulty in actually finding them. Therefore, the records available are not likely accurate reflections of population numbers. Recent dedicated surveys by Preston (1990), Joy et al. (1995), and Ramsay (1997) failed to locate White-headed Woodpeckers.

According to Breeding Bird Surveys (BBS; reference period 1966-2007), global White-headed Woodpecker populations have increased (2.1 +/- 1.3%; Sauer et al. 2008). No BBS trend data is available for White-headed Woodpeckers in Canada. Public sightings records (1952-2010; Table 2) suggests that the population has fluctuated over the last 50 years.

Table 2. Average numbers of White-headed Woodpecker sightings per year, by decade, in British Columbia (1952 and 2010). Ranges are in parentheses. Cases where multiple observers reported a bird at the same location were treated as one sighting. Data from 1952-2002 were provided by the B.C. Ministry of Environment. Additional public sightings (2003-2010) were reported to CWS.

Average # of sightings per year	1950s	1960s	1970s	1980s	1990s	2000s
Breeding season (Mar. - Aug.)	0.6 (0-4)	4.1 (1-9)	1.3 (0-5)	0.8 (0-3)	0.4 (0-2)	0.8 (0-3)
Winter (Sept. – Feb.)	0.6 (0-3)	2.5 (0-6)	0.8 (0-3)	0.9 (0-3)	0.8 (0-3)	0.5 (0-1)

3.3 Needs of the White-headed Woodpecker

White-headed Woodpeckers require habitat with an abundant supply of their main food source, pine seeds, especially in the non-breeding period. Ponderosa Pines produce good crops only every 4-5 years (Dahms and Barrett 1970), limiting White-headed Woodpecker population growth. In the breeding season they also eat invertebrates from the trunks, branches, and needle clusters of coniferous trees, predominantly Ponderosa Pine (Garrett et al. 1996). Dixon (1995) found that the northern subspecies of White-headed Woodpecker in Oregon State required habitat with the following characteristics for breeding, roosting and foraging:

1. Ponderosa Pine > 53 cm diameter at breast height (dbh), and less than 57% canopy closure within the stand overall;
2. ≥ 5 snags per hectare, > 25cm dbh, moderate decay class;
3. 100 (for continuous sites) to 400 ha (for fragmented sites) of habitat (per breeding territory).

It is likely that White-headed Woodpecker breeding territories in Canada will be as large as, if not larger than those in Oregon, because British Columbia has only one species of pine that is

used (Ponderosa Pine), and the habitat is also degraded due to past forest harvest (loss of large-diameter trees) and fire suppression (forest in-growth). In British Columbia, the total area of potentially suitable (i.e., Ponderosa Pine-dominated) habitat in the south Okanagan-Similkameen area is 37,635 ha (Wood 2003).

Given the peripheral nature of the White-headed Woodpecker population in Canada, immigration from the United States is vital in sustaining and stabilizing the number of birds breeding in Canada (see section 5.0 Population and Distribution Objectives). Therefore, in order for White-headed Woodpecker populations to persist in Canada, suitable and unfragmented habitat must be maintained and/or restored not just within Canada, but also within adjacent U.S. states.

4. THREATS

4.1 Threat Assessment

Table 3. Threat Assessment Table

Threat	Level of Concern ¹	Extent	Occurrence	Frequency	Severity ²	Causal Certainty ³
Threat Category: Changes in ecological dynamics or natural processes						
Fire Suppression	High	Widespread	Historic, current, anticipated	Continuous	High	Medium
Pine Beetles	Medium	Localized	Historic, current, anticipated	Recurrent	Unknown	Medium
Threat Category: Habitat Loss or Degradation						
Legacy of Past Commercial Forestry	Medium	Localized	Historic, current legacy	Historic	High	High
Threat Category: Climate and Natural Disasters						
Climate Change	Unknown	Widespread	Anticipated	Continuous	Unknown	Medium

¹ *Level of Concern: signifies that managing the threat is of (high, medium or low) concern for the recovery of the species, consistent with the population and distribution objectives. This criterion considers the assessment of all the information in the table.*

² *Severity: reflects the population-level effect (High: very large population-level effect, Moderate, Low, Unknown).*

³ *Causal certainty: reflects the degree of evidence that is known for the threat (High: available evidence strongly links the threat to stresses on population viability; Medium: there is a correlation between the threat and population viability e.g. expert opinion; Low: the threat is assumed or plausible).*

4.2 Description of Threats

In Canada, White-headed Woodpecker depends on Ponderosa Pine forests, an ecosystem type that makes up a small portion of the provincial land base and is of conservation concern (Austin et al. 2008, B.C. Conservation Data Centre 2010). Ponderosa Pine ecosystems have been impacted by historic logging, fire suppression, and pine beetles. Climate change may also influence fire cycles and behaviour and the extent and severity of pine beetle outbreaks, so is an additional threat to Ponderosa Pine ecosystems.

Fire suppression

As a result of low fire return frequencies (because of historic and current fire suppression activities), the density of younger coniferous trees has increased (Turner and Krannitz 2001). This has degraded Ponderosa Pine habitats for White-headed Woodpecker and other species dependent on more open, mature stands. Many Ponderosa Pine forests in the Okanagan are currently characterized by dense stands of young trees, resulting in poor cone production and less food for White-headed Woodpeckers (Krannitz and Duralia 2004). Because of fire suppression, there is also an increased probability of catastrophic (i.e., stand replacing) fires (Noss et al. 2006), which could remove mature live trees, snags and degrade soil properties, potentially limiting recolonization.

Pine beetles

Western Pine Beetle (*Dendroctonus brevicomis*) is a common pest of unhealthy, weak or dying Ponderosa Pine and has started to infest entire stands at the northern edge of the range of White-headed Woodpecker in trees weakened by intense wildfire in Okanagan Mountain Provincial Park (Drew Carmichael, B.C. Ministry of Environment [retired], pers. comm.). The potential impact of the infestation is not yet known, and represents a knowledge gap that must be addressed through future work. During the drought of the 1930s, the extent of the infestation was so great that foresters feared that Ponderosa Pine would be exterminated (Oliver and Ryker 1990).

Though not normally a pest of Ponderosa Pine, the Mountain Pine Beetle (*D. ponderosae*) is also starting to infest high density stands of Ponderosa Pine in the south Okanagan (Drew Carmichael pers. comm.) possibly due to reduced vigor of the larger trees in overcrowded conditions (Oliver and Ryker 1990) or the sheer epidemic levels of the insect, resulting in a shortage of their preferred host species, Lodgepole Pine (*Pinus contorta*). Salvage harvesting of beetle-killed trees has been mandated by the Province of British Columbia (B.C. Ministry of Forests and Range 2009). The volume of pine (all species) that has been subject to salvage harvesting of bark beetle-infested stands has increased in recent years within the Okanagan area (B.C. Ministry of Forests and Range 2009). However, it is unlikely that this salvage harvesting will severely impact nesting habitat in the short- to mid-term as there will likely be an increase in standing dead Ponderosa Pine due to an inability to access all infested areas (Grant Furness, B.C. Ministry of Environment, pers. comm.). Over the longer term, however, this immediate pulse of nesting habitat will likely come at the expense of cone producing habitat and forage productivity (e.g., see Chan-McLeod 2006).

Legacy of past commercial forestry

Though Ponderosa Pine is not currently harvested commercially, Ponderosa Pine habitat has been degraded through historical harvesting of larger diameter (>45cm dbh) pines, which are known to produce heavier cone crops (Krannitz and Duralia 2004). Most of the old growth Ponderosa Pine forests of British Columbia were logged in the 1930s and 1940s with only scattered remnants remaining by the 1950s (Klenner et al. 2008). Adequate time has now passed for many historically harvested stands to be approaching an age that should be appropriate for White-headed Woodpecker occupancy. However, the legacy of clearcut harvesting coupled with decades of fire suppression has left dense, even-aged stands that lack the open structure that facilitates cone production and is preferred by White-headed Woodpeckers. Current forest safety standards also encourage the removal of “danger trees²”, which could limit the number of potential nest sites available to White-headed Woodpeckers (Fraser et al. 1999).

Because of the small population size in Canada, the long-term viability of White-headed Woodpeckers is likely dependent on the breeding success of birds in adjoining United States. Forest harvesting activities in the Pacific Northwest have fragmented old-growth Ponderosa Pine and have been explicitly linked with population declines of White-headed Woodpecker in Idaho and Oregon (Garrett et al. 1996). The degree of integration between White-headed Woodpecker populations in the United States and Canada is not known. Habitat restoration activities, which include stand thinning and prescribed burns, are being carried out in Ponderosa Pine forests in Washington, with apparently beneficial results for White-headed Woodpecker (Dale Swedberg Washington Department of Fish and Wildlife, pers. comm.; Gaines et al. 2007, 2010)

Climate change

Climate records from 1902 to 2001 show a continuing trend of increased temperature and precipitation in the Okanagan Valley (Cohen and Kulkarni 2001). Increased precipitation promotes regeneration of understorey trees (PNRS 2004), which compromises the open forest structure required by White-headed Woodpeckers. This forest in-growth, in combination with increased average temperatures, may result in a greater likelihood of catastrophic fire (Schoennagel et al. 2004). Warmer average temperatures have also been linked with increases in the extent and severity of pine beetle outbreaks (Logan et al. 2003).

5. POPULATION AND DISTRIBUTION OBJECTIVE

The population and distribution objective of this Recovery Strategy is to enable a population of White-headed Woodpeckers to exist within historically-occupied habitat.

Rationale: Knowledge of historical and current population levels is lacking, making it impossible to calculate a minimum viable population size, or to determine whether the species has ever been self-sustaining within Canada. A realistic objective, based on current knowledge, is to ensure that appropriate conditions exist in historically-occupied habitat to support potential

² Work Safe B.C. term for a tree that is a hazard for forest worker safety.

use by White-headed Woodpeckers. The objective will be revisited every 5 years based on new knowledge.

In addition, because the small Canadian population of White-headed Woodpecker occurs at the northern part of its continental range, and the vast majority of its continental distribution and population occurs further south in the United States, population changes at the continental level may have a significant effect on recovery feasibility in Canada. If the continental population experiences an ongoing downward or upward population trend, its range may correspondingly shift, expand, or contract. As such, the Canadian population may reflect both these continental range changes and local response to the provision of suitable habitat and mitigation of key threats. This objective reflects that uncertainty.

6. BROAD STRATEGIES AND GENERAL APPROACHES TO MEET OBJECTIVE

6.1 Actions Already Completed or Currently Underway

Efforts to determine the population size and distribution have been aided by surveys conducted by Preston (1990), Joy et al. (1995) and Ramsay (1997), and anecdotal observations by the Cannings family. Sightings have been reported by the general public as a result of public education and outreach efforts. However, this rare and elusive species remains difficult to inventory.

Research on habitat suitability in Canada and U.S.A. has been ongoing. Habitat modeling efforts using forest cover and Terrestrial Ecosystem Mapping (TEM) have been tested and have not aided in ability to predict sightings of the species; however, additional testing will occur using updated datasets.

Experimental thinning and prescribed burns have been conducted within several hundred hectares of Ponderosa Pine forests, with the objective of restoring more natural (i.e., open) stand conditions (Grant Furness, British Columbia Ministry of Environment, pers. comm.).

6.2 Strategic Direction for Recovery

Table 4. Recovery Planning Table

Threat or Limitation	Priority	Broad Strategy to Recovery	General Description of Research and Management Approaches
Fire suppression, pine beetles, legacy of past commercial forestry	Urgent	Habitat characterization and management	<ul style="list-style-type: none"> • Identify characteristics of traditionally-occupied habitat (target most recently-occupied areas) and determine where additional habitat with those characteristics occurs on the landscape. • Set management objectives for identified sites, including fire suppression, restoration, salvage harvesting, and silviculture. • Establish restoration techniques and define targets for habitat condition.
Lack of information about population size, distribution, and habitat use in Canada	Necessary	Public outreach	<ul style="list-style-type: none"> • Prepare and distribute outreach materials to naturalists, private land stewards, landowners, forestry workers, etc., in order to both educate them about White-headed Woodpeckers and the species’ importance and encourage them to report sightings. Plan for and implement a follow-up outreach program.
Lack of information about threats	Beneficial	Research	<ul style="list-style-type: none"> • Establish the severity of threat presented by pine beetles and associated timber salvage, fire suppression (forest in-growth), climate change and any potential future forest harvesting.

6.3 Narrative to Support the Recovery Planning Table

Habitat Characterization and Management

The first step in recovering the White-headed Woodpecker will be to characterize occupied habitat within British Columbia. Wood (2003) mapped historically-occupied White-headed Woodpecker habitat by establishing 400-ha buffers around all detection records since 1952 and then discounting overlapping areas. Four hundred hectares was selected as the buffer area based on a precautionary assumption that territories within British Columbia would fall on the larger side of the observed spectrum (see Dixon 1995) due to habitat degradation and the absence of multiple pine species (see Section 3.3 – Needs of the White-headed Woodpecker). The next step toward White-headed Woodpecker recovery will be to characterize the habitat within historically-occupied areas (prioritizing areas where birds have been detected during the breeding season, within the last 10 years) to establish a reliable definition of “suitable habitat”. Additional areas with “suitable” characteristics can then be identified, and management objectives established. Restoration and active silvicultural management will be required for much of the identified habitat because traditional forest harvesting and fire suppression have resulted in habitat degradation.

Public Outreach

Basic information about the species’ population size and distribution, as well as habitat preferences in Canada, are lacking. Establishing these basic parameters will require gathering information from public sightings and Aboriginal Traditional Knowledge.

Public outreach and targeted landowner contact can take place through various approaches including the Wildlife Tree Stewardship Program and the South Okanagan Similkameen Stewardship Program.

Research

The absolute and relative severity of the threats listed in Section 4.0 - Threats is largely unknown. A more rigorous examination of the threats will improve the ability to mitigate their effects and prioritize recovery efforts.

7. CRITICAL HABITAT

7.1 Identification of the Species' Critical Habitat

Critical habitat cannot be identified for White-headed Woodpeckers at this time. Information is lacking about the current population size and distribution of White-headed Woodpecker in British Columbia. Although there is knowledge of the general habitat requirements necessary for White-headed Woodpecker, particularly for the range of the subspecies in the adjacent American states, there is not adequate information available on the characteristics of the habitat used in Canada, the distribution of appropriate Ponderosa Pine stands, and the number of White-headed Woodpeckers potentially supported by those stands, to allow for area-based critical habitat identification.

7.2 Schedule of Studies to Identify Critical Habitat

Table 5. Schedule of Studies

Description of Activity	Outcome/Rationale	Timeline
1. Characterize the habitat (on the ground and using GIS and Remote Sensing) within recorded White-headed Woodpecker territories (focusing on recent records), and compare with American data.	Characterization of suitable habitat in British Columbia, as compared to what has been described elsewhere.	2012
2a. Evaluate the reliability of updated TEM¹ and Landsat data for predicting White-headed Woodpecker occurrences.	Identification of data sources that are most likely to have information that enables accurate prediction of suitable habitat and White-headed Woodpecker occurrence.	2012
2b. If updated TEM and/or Landsat data is not reliable, field update and then evaluate the reliability of forest cover (provincial Vegetation Resources Inventory - VRI) data.		
3. Use most reliable updated landscape data in combination with habitat suitability definitions from the habitat characterization to develop habitat models (including the classes: suitable and occupied, suitable but unoccupied, unsuitable but restorable, and unsuitable).	Identification of all suitable or restorable occupied and unoccupied habitat within the known range of the White-headed Woodpecker.	2014
4. Use spatial mapping of historically/recently-occupied habitat in conjunction with habitat models to identify important sites.	To the extent possible, complete a draft identification of critical habitat.	2015

¹TEM and Forest Cover data were found to be inaccurate at predicting suitable habitat for White-headed Woodpecker: 52% for the TEM data, and 46% for the forest cover data (Sarell, Wood and Haney 2003). However, the TEM mapping has been updated since 2003 and is worth retesting.

8. MEASURING PROGRESS

The performance indicators presented below provide a way to define and measure progress toward achieving the population and distribution objectives. Specific progress towards implementing the recovery strategy will be measured against indicators outlined in subsequent action plans.

- 1) Have the characteristics of suitable habitat and where it occurs on the landscape been determined?
- 2) Have habitat restoration techniques and target habitat condition been tested, evaluated, and established?
- 3) Have realistic targets for habitat restoration quantity and timelines been established?
- 4) Has restoration been implemented where needed?

9. STATEMENT ON ACTION PLANS

An action plan will be completed in 2016.

10. REFERENCES

- Austin, M.A., D.A. Buffett, D.J. Nicolson, G.G.E. Scudder and V. Stevens (eds.). 2008. Taking Nature's Pulse: The Status of Biodiversity in British Columbia. Biodiversity BC, Victoria, BC. 268 pp. Available at: www.biodiversitybc.org.
- B.C. Conservation Data Centre. 2010. BC Species and Ecosystems Explorer. B.C. Min. Environ., Victoria, BC. <<http://a100.gov.bc.ca/pub/eswp/>> (Accessed Sept. 27, 2010).
- B.C. Conservation Framework. 2010. Conservation Framework Summary: *Picoides albolarvatus*. B.C. Minist. of Environment. Available: <http://a100.gov.bc.ca/pub/eswp/> (accessed Jun 16, 2010).
- B.C. Ministry of Forests and Range. 2009. Monitoring Harvest Activity Across 29 Mountain Pine Beetle Impacted Management Units. Unpublished report. Forest Analysis and Inventory Unit. Available: http://www.for.gov.bc.ca/hfp/mountain_pine_beetle/Monitoring-Harvest-Activity-Across-29-Mountain-Pine-Beetle-impacted-management-units_FINAL.pdf (Accessed July 30, 2010)
- Campbell, R.W., N.K. Dawe, I. McTaggart-Cowan, J.M. Cooper, G.W. Kaiser and M.C.E. McNall. 1990. The Birds of British Columbia, Volume 2: Nonpasserines, Diurnal birds of prey through woodpeckers. Royal British Columbia Museum and Canadian Wildlife Service.
- Cannings, R.J. 1995. Status report on the White-headed Woodpecker, *Picoides albolarvatus*, in British Columbia. B.C. Ministry of Environment, Victoria, B.C. Wildlife Bulletin No. B-80.
- Cannings, R.J. 2000. Update COSEWIC Status Report on White-headed Woodpecker (*Picoides albolarvatus*). Committee on the Status of Endangered Wildlife in Canada.
- Cannings, R.A., R.J. Cannings and S.G. Cannings. 1987. Birds of the Okanagan Valley, British Columbia. The royal British Columbia Museum, Victoria, B.C.
- Chan-McLeod, A. 2006. A review and synthesis of the effects of unsalvaged mountain-pine-beetle attacked stands on wildlife and implications for management. B.C. Journal of Ecosystems and Management 7(2):199-132.
- Cohen, S, and T. Kulkarni. 2001. Water management and climate change in the Okanagan Basin. Environment Canada and University of British Columbia. Available: http://adaptation.nrcan.gc.ca/projdb/pdf/46_e.pdf (Accessed September 29, 2010).

- COSEWIC 2000. COSEWIC assessment and update status report on the Whiteheaded Woodpecker *Picoides albolarvatus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 17 pp
- Dahms, W.G. and J.W. Barrett. 1975. Seed production of central Oregon ponderosa and lodgepole pines. USDA Forest Service, Research Paper PNW-191.
- Dixon, R.D. 1995. Ecology of White-headed Woodpeckers in the central Oregon cascades. MSc thesis. University of Idaho, Moscow, Idaho.
- Dixon, R.D. 1995b. Density, nest-site and roost-site characteristics, home range, habitat-use, and behavior of White-headed Woodpeckers: Deschutes and Winema National Forests, Oregon. Unpublished report prepared for Oregon Department of Fish and Wildlife Nongame Project Number 93-3-01.
- Fraser, D.F., W.L. Harper, S.G. Cannings and J.M. Cooper. 1999. Rare birds of British Columbia. Wildlife Branch and Resources Inventory Branch, B.C. Ministry of Environment, Lands and Parks, Victoria, B.C. 244pp.
- Gaines, W.L., M. Haggard, J.F. Lehmkuhl, A.L. Lyons, and R.J. Harrod. 2007. Short-term response of land birds to Ponderosa Pine restoration. *Restoration Ecology* 15: 666–674.
- Gaines, W., M. Haggard, J. Begley, J. Lehmkuhl, and A. Lyons. 2010. Short-term effects of thinning and burning restoration treatments on avian community composition, density, and nest survival in the Eastern Cascades dry forests, Washington. *Forest Science* 56: 88-99.
- Garrett, K.L., M.G. Raphael and R.D. Dixon. 1996. White-headed Woodpecker (*Picoides albolarvatus*). In *The Birds of North America*, No. 252 (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, PA.
- Government of Canada. 2009. *Species at Risk Act* Policies, Overarching Policy Framework [Draft]. *Species at Risk Act* Policy and Guidelines Series. Environment Canada. Ottawa. 38 pp.
- Joy, J., R. Van den Driessche and S. McConnell. 1995. 1995 White-headed Woodpecker population and habitat inventory in the South Okanagan. Unpublished report, B.C. Ministry of Environment, Lands and Parks, Penticton, B.C.
- Klenner, W., R. Walton, A. Arsenault, L. Kremsater. 2008. Dry forests in the Southern Interior or British Columbia: Historic disturbances and implications for restoration and management. *Forest Ecology and Management*. 256:1711-1722
- Krannitz, P.G. and T. Duralia. 2004. Cone and seed production in *Pinus ponderosa* – a review. *The Western North American Naturalist*. 64:208-218.

- Logan, J. A., J. Regniere, and J. A. Powell. 2003. Assessing the impacts of global warming on forest pest dynamics. *Frontiers in Ecology and Environment* 1:130–137.
- NatureServe. 2009. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: June 16, 2010).
- Noss, R. F., J. F. Franklin, W. L. Baker, T. Schoennagel, and P. B. Moyle. 2006. Managing fire-prone forests in the western United States. *Frontiers in Ecology and Environment* 4:481–487.
- Oliver, W.W. and R.A. Ryker. 1990. Ponderosa Pine. Pp. 413-424 *in* Burns, R.M and B.H. Honkala (eds.) *Sylvics of North America, Volume 1: Conifers*. USDA Forest Service, Agricultural Handbook 654, Washington, D.C.. (http://www.na.fs.fed.us/spfo/pubs/silvics_manual/volume_1/pinus/ponderosa.htm).
- Partners in Flight. 2007. PIF Landbird Populations Estimates Database. Rocky Mountain Bird Observatory, Brighton, CO. Available http://rmbo.org/pif_db/laped/PED4.aspx (accessed Oct. 12, 2009).
- PNRS, Pacific Northwest Research Station. 2004. Western forests, fire risk and climate change. Science Update, Issue 6, January 2004. <http://www.fs.fed.us/pnw>
- Preston, A. 1990. Canyon Wren, Sage Thrasher, White-headed Woodpecker, Gray Flycatcher and Grasshopper Sparrows in the South Okanagan. Unpublished field report, British Columbia Ministry of Environment, Penticton, British Columbia
- Ramsay, L. 1997. White-headed Woodpecker survey in the South Okanagan, B.C. (1996 and 1997). Unpublished report, Ministry of Environment, Lands and Parks, Wildlife Branch, Penticton, B.C.
- Sauer, J. R., J. E. Hines, and J. Fallon. 2008. The North American Breeding Bird Survey, Results and Analysis 1966 - 2007. Version 2008.1. [USGS Patuxent Wildlife Research Center](http://www.mbr-pwrc.usgs.gov/bbs), Laurel, MD Website: www.mbr-pwrc.usgs.gov/bbs.
- Sarell, M.J., C. Wood, and A. Haney. 2003. An assessment of two types of habitat models for the White-headed Woodpecker using habitat field data and sightings in the south Okanagan. Unpublished report, Ministry of Environment, Lands and Parks, Wildlife Branch, Penticton, B.C.
- Schoennagel, T., T. T. Veblen, and W. H. Romme. 2004. The interaction of fire, fuels, and climate across Rocky Mountain forests. *Bioscience* 54:661–676.
- Turner, J. and P.G. Krannitz. 2001. Conifer density increases in semi-desert habitats in British Columbia in the absence of fire. *Northwest Science*. 75:176-182.

Weber, W.C. and S.R. Cannings. 1976. The White-headed Woodpecker (*Dendrocopos albobarvatus*) in British Columbia. *Syesis* 9: 215-220.

Wood, C. 2003. An assessment of White-headed Woodpecker habitat and population estimates in the south Okanagan using a terrestrial ecosystem mapping model. Unpublished report, Ministry of Environment, Lands and Parks, Wildlife Branch, Penticton, B.C.

APPENDIX A: EFFECTS ON THE ENVIRONMENT AND OTHER SPECIES

A strategic environmental assessment (SEA) is conducted on all SARA recovery planning documents, in accordance with the *Cabinet Directive on the Environmental Assessment of Policy, Plan and Program Proposals*. The purpose of a SEA is to incorporate environmental considerations into the development of public policies, plans, and program proposals to support environmentally sound decision-making.

Recovery planning is intended to benefit species at risk and biodiversity in general. However, it is recognized that strategies may also inadvertently lead to environmental effects beyond the intended benefits. The planning process based on national guidelines directly incorporates consideration of all environmental effects, with a particular focus on possible impacts upon non-target species or habitats. The results of the SEA are incorporated directly into the strategy itself, but are also summarized below in this statement.

The potential for the strategy to inadvertently lead to adverse effects on other species was considered. The SEA concluded that this strategy will clearly benefit the environment and will not entail any significant adverse effects.

This recovery strategy will clearly benefit the environment by promoting the recovery of the White-headed Woodpecker and by enhancing habitat shared by other species. As a weak cavity excavator, the White-headed Woodpecker creates cavities that could be used by a suite of other species; however, other SARA-listed cavity-nesting species (Lewis's Woodpecker *Melanerpes lewis* and Flammulated Owl *Otus flammeolus*) are likely too big to use cavities created by White-headed Woodpecker. Many species share the White-headed Woodpecker's requirements for open Ponderosa Pine stands, so that restoration of Ponderosa Pine habitats will be of benefit. California bighorn sheep would benefit from creation or protection of suitable White-headed Woodpecker habitat because they feed on bluebunch wheatgrass (*Psuedoroegneria spicata*), which is the dominant ground cover in natural, open Ponderosa Pine forests, and they are less susceptible to predation in more open stands.