

LEWIS'S WOODPECKER

Melanerpes lewis

Original¹ prepared by Martin Gebauer

Species Information

Taxonomy

The Lewis's Woodpecker is currently placed in the genus *Melanerpes*, a genus with 21 species (Tobalske 1997). It has often been placed in the monotypic genus *Asyndesmus* (Bock 1970; AOU 1983). Five other *Melanerpes* species occur in North America (north of Mexico): Red-headed Woodpecker (*M. erythrocephalus*), Acorn Woodpecker (*M. formicivorus*), Golden-fronted Woodpecker (*M. aurifrons*), Red-bellied Woodpecker (*M. carolinus*), and Gila Woodpecker (*M. uropygialis*) (NGS 1999). The Lewis's Woodpecker is considered to be closely related to the Red-headed Woodpecker and possibly the Acorn Woodpecker (Tobalske 1997). No subspecies of Lewis's Woodpecker are recognized (AOU 1983).

Description

The upperparts of adult Lewis's Woodpecker are a glossy greenish-black except for a narrow grey collar. The face is a dark red and the breast is grey, shading into rose on the abdomen, flanks, and sides. Young are similar to adults but lack the red face and grey collar. In flight, its overall dark appearance, large size, and slow, steady wingbeats give it a crow-like appearance (Bent 1939). Flight is not undulating like that of other woodpeckers (e.g., genus *Picoides*) (Godfrey 1986; NGS 1999).

Distribution

Global

The Lewis's Woodpecker is restricted to North America, breeding from southern British Columbia through the western United States to California and southern New Mexico, and east to western

Oklahoma and Nebraska (Bent 1939; Tobalske 1997). Its distribution appears to be closely related to the presence of ponderosa pine (*Pinus ponderosa*) (Tobalske 1997).

Lewis's Woodpeckers winter within the southern portion of their breeding range as far north as southwestern Oregon, central Utah, and central Colorado. It winters south of its breeding range to northern Baja California Norte, Chihuahua, and Sonora, Mexico (Howell and Webb 1995; Tobalske 1997).

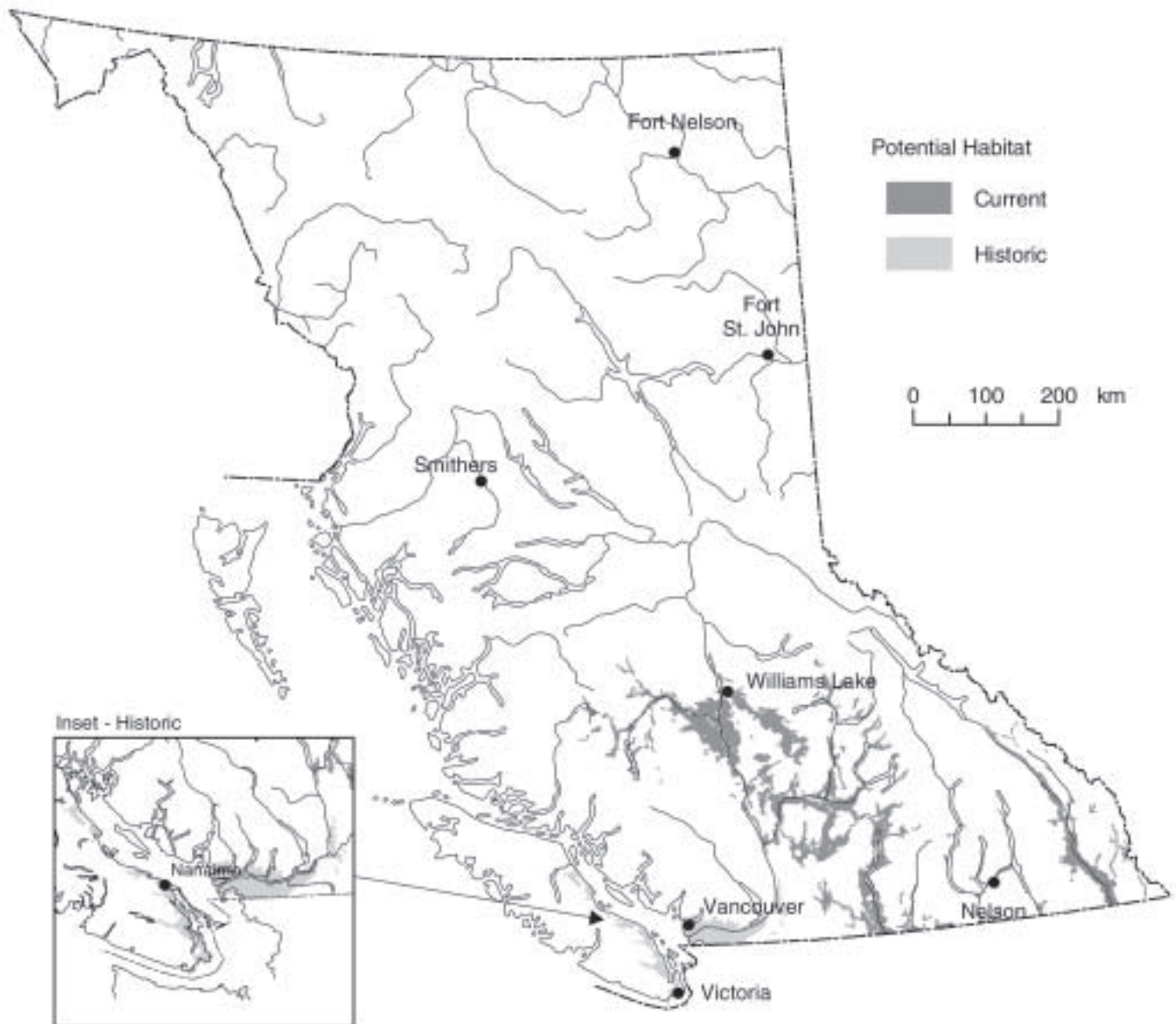
British Columbia

The Lewis's Woodpecker breeds locally throughout the southern Interior of British Columbia from the Similkameen Valley, east to the East Kootenay (e.g., Invermere south to Newgate and the Tobacco Plains) and north to the Chilcotin-Cariboo area (Campbell et al. 1990, Cooper and Beauchesne 2000). It is most abundant in the south Okanagan (Cannings et al. 1987). Breeding has been documented in Golden and Revelstoke, but these populations appear to have been extirpated (Cooper et al. 1998). Individuals have been seen recently in mature cottonwood stands in the Robson Valley of east-central British Columbia although breeding there has not yet been documented (L. Ingham, pers. comm.). Lewis's Woodpecker was a former abundant breeder in the Lower Mainland and on southeastern Vancouver Island between the 1920s and 1940s, when extensive clearcuts with abundant snags were available. Breeding in this region was last confirmed in 1963 (Campbell et al. 1990).

A few birds winter in the south Okanagan with the centre of abundance from Vaseux Lake to Summerland. In winter it appears to be restricted to residential areas and orchards (Cannings et al. 1987).

¹ Volume 1 account prepared by T. Manning

Lewis's Woodpecker (*Melanerpes lewis*)



Note: This map represents a broad view of the distribution of potential habitat used by this species. The map is based on several ecosystem classifications (Ecoregion, Biogeoclimatic and Broad Ecosystem Inventory) as well as current knowledge of the species' habitat preferences. This species may or may not occur in all areas indicated. More detailed maps are available for this species from the Ministry of Sustainable Resource Management.

Forest region and districts

Coast: Chilliwack, South Island (historical)
Southern Interior: 100 Mile House, Arrow Boundary, Cascades, Central Cariboo, possibly Columbia, Headwaters, Kamloops, Kootenay Lake, Okanagan Shuswap, Rocky Mountain

Ecoprovinces and ecosections

CEI: FRB, possibly CAB, CAP, CCR, CHP, QUL
COM: FRL (historical)
GED: LIM, NAL (historical)
SIM: CCM, EKT, ELV, EPM, MCR, SCM, SFH, SPK, SPM, UCV
SOI: GUU, NIB, NOB, NOH, NTU, OKR, PAR, SCR, SHB, SOB, SOH, STU, THB, TRU

Biogeoclimatic units

BG: xh1, xh2, xh3, xw, xw1, xw2
ICH: dw, mk1, mw2, mw3, xw
IDF: dk1, dk2, dk3, dk4, dm, dm1, dm2, dw, mw1, mw2, un, xh1a, xh2a, xm, xw, xw2
PP: dh1, dh2, xh1, xh2
MS: un, dk
SBPS: mk, xc

Broad ecosystem units

AB, AC, BS, CR, DF, DL, DP, OV, PP, RR, SS, UR, WR

Elevation

In British Columbia, the Lewis's Woodpecker has been observed nesting at elevations ranging from 250 to 1160 m (Campbell et al. 1990; Cooper and Beaudesne 2000). All nests above 1000 m were in burns (Cooper and Beaudesne 2000).

Life History

Diet and foraging behaviour

The diet of Lewis's Woodpeckers varies with the seasonal abundance of food items, but includes primarily free-living (i.e., not wood-boring) insects, acorns and other nuts, seed and berries, and wild and agricultural fruit (Sherwood 1927; Bent 1939; Bock 1970; Cannings et al. 1987; Tobalske 1997). Insects taken include ants, butterflies, bees, wasps, beetles, crickets, and grasshoppers (Cannings et al. 1987; Tobalske 1997). Succulent fruits taken include apples,

cherries, peaches, Saskatoon (*Amelanchier alnifolia*), hawthorn (*Crataegus* spp.), dogwood (*Cornus* spp.), elderberry (*Sambucus* spp.), and sumac (*Rhus* spp.) (Cannings et al. 1987; Tobalske 1997).

During the breeding season, Lewis's Woodpeckers primarily forage by hawking insects in the air, but will also glean insects from tree trunks, branches, bushes, and the ground (Bock 1970; Short 1982 Raphael and White 1984). Extended feeding flights of greater than 30 minutes have been observed (Bent 1939; Beaudesne, pers. obs.). Snags or dead-topped trees and human-made structures such as telephone poles and fence posts that provide an open view are used for perching when hawking insects. Foraging substrates in the Sierra Nevada were primarily snags (i.e., 66% of 88 foraging bouts), with ground and live trees used to a lesser extent (Raphael and White 1984). The most common position used on the tree was the trunk (i.e., 68%) (Raphael and White 1984). Although no studies in British Columbia have specifically investigated diet, free flying insects and fruits, especially berries, seem to be the most important food items during breeding season (Cannings et al. 1987; Beaudesne, pers. obs.).

Lewis's Woodpeckers also collect and store nuts, such as acorns, primarily in the winter, and in some areas, corn in the fall (Hadow 1973; Vierling 1997). On several occasions in the Penticton and Summerland areas, it has been observed storing acorns of the introduced red oak (*Quercus rubra*) in the cracks of power poles (Cannings et al. 1987). Interestingly, Lewis's Woodpeckers first husk acorns, often cutting them into pieces, before storing them (Bent 1939; Ehrlich et al. 1988). Oak trees, cottonwood, and cracked telephone poles are some of the principal storage areas reported (Tobalske 1997). In the East Kootenay trench, during the breeding season, birds were observed caching beetles in the bark of ponderosa pine and in the cracks of utility poles (Beaudesne, pers. obs.).

Reproduction

Dates for 69 clutches in British Columbia ranged from 16 April to 27 June, with 53% recorded between 23 May and 11 June (Cannings et al. 1987; Campbell et al. 1990). Average size of 30 clutches

ranged from two to eight eggs with 63% having four to six eggs (Campbell et al. 1990). Bent (1939) has reported clutch sizes of up to nine eggs. Average incubation period ranges from 13 to 14 days (Ehrlich et al. 1988) with up to 16 days reported (Tobalske 1997). Dates for 165 broods in British Columbia ranged from 5 May to 3 August with 51% recorded between 12 June and 6 July (Campbell et al. 1990). Sizes of 28 broods ranged from one to five young with 89% having two to four young (Campbell et al. 1990). Fledgling period ranges from 28 to 34 days (Ehrlich et al. 1988; Tobalske 1997).

Lewis's Woodpeckers have been reported to be colonial in some areas (Currier 1928; Linder and Anderson 1998). Cooper and Beaudesne (2000) found three active nests in a live ponderosa pine near Newgate, in the East Kootenay in 1997. In 1998, the same tree harboured two active Lewis's Woodpecker pairs and one American Kestrel pair. The Lewis's Woodpeckers from this nest tree primarily travelled to forage within the open burn on the edge of Lake Koocanusa (Beaudesne, pers. obs.). Concentrations of Lewis's Woodpeckers have also been found in the Finlay Creek Burn (31 nesting pairs) and the Dutch Creek burn (seven nesting pairs) of the East Kootenay Trench (Cooper and Gilles 1999).

Site fidelity

Site fidelity is difficult to determine because very few researchers have banded these birds, marking individuals (Tobalske 1997). However, the same cavities are often used in successive years (Bent 1939; Tobalske 1997). In Wyoming, 37% of nest cavities found in 1993 were reused in 1994 (Linder and Anderson 1998). In the East Kootenay Trench, 60% of nest cavities found in 1997 were reused in 1998 (Cooper and Beaudesne 2000). In addition, where cavities had been destroyed or removed between breeding seasons, a pair was often found nesting nearby (Cooper and Beaudesne 2000).

Home range

Little is known of the home range of Lewis's Woodpeckers. Adults defend the immediate vicinity of nesting trees and mast stores in fall and winter (Hadow 1973; Tobalske 1997). In the Blue Mountains

of Washington and Oregon, territory size of 6.1 ha/pair has been reported (Thomas et al. 1979). In the East Kootenay Trench, birds were observed travelling more than 1 km from their nest to forage, suggesting that some home ranges may be extensive (Beaudesne, pers. obs.).

Movements and dispersal

Most birds in British Columbia are migratory arriving within the first 2 weeks of May, although early arrivals appear in mid-April. Large flocks gather in late summer, wandering through foraging habitats in their local ranges. Peak autumn movement is between late August and early September. Few birds remain after the end of September (Campbell et al. 1990). One notable migration of Lewis's Woodpeckers was observed on 7 September 1971, when 42 birds in groups of two and three, moved past McIntyre Bluffs (Cannings et al. 1987).

Lewis's Woodpeckers wander irregularly, having been reported as far north as Masset on the Queen Charlotte Islands and at Takla Lake in the central Interior of British Columbia (Campbell et al. 1990).

Habitat

Structural stage

- 2: herb – foraging for ants, beetles and other insects
- 3a: low shrub – shrub stage for foraging when insects are abundant
- 3b: high shrub – possibly used for foraging when insects are abundant
- 5: immature forest – particularly in black cottonwood stands
- 6: mature forest – black cottonwood, ponderosa pine and oak stands
- 7: old-growth forest – black cottonwood, ponderosa pine and oak stands

Important habitats and habitat features

Nesting

Typical breeding habitat in the interior of British Columbia includes deciduous groves (e.g., mature cottonwood stands), open ponderosa pine forests, recent burns, sagebrush/pine/bunchgrass grasslands,

agricultural areas, and urban environments (Campbell et al. 1990; Cooper et al. 1998; Cooper and Beauchesne 2000).

Good breeding habitat is characterized by an open canopy (e.g., <25% crown closure), the availability of a suitable dead or dying tree (>30 cm dbh) for a nesting site, and understorey vegetation that provides an abundant supply of insects. Where closed canopy riparian stands are used, trees at the edge of the stand are usually used for nesting (Fraser et al. 1999). In the East Kootenay, a high density (i.e., 59% of 85 nests) of breeding Lewis's Woodpeckers were found in areas that were burned by stand-destroying fires (i.e., characterized by open space with a few remaining snags) between 13 and 28 years ago (Cooper and Beauchesne 2000). Bock (1970) indicated that burns <10 years and >40 years are likely of low use because of successional factors. However, in southwestern Idaho, Saab and Dudley (1998) found a high density of Lewis's Woodpecker, 2–4 years after a stand-destroying fire, in areas that had been salvage logged. In Wyoming, 98% of Lewis's Woodpecker nests studied by Linder and Anderson (1998) were found within burned stands despite these stands comprising only 26% of the 11 100 ha study area.

In Colorado, Vierling (1997) found that mature cottonwood forests were critical for breeding and mast storage, whereas little breeding was evident in ponderosa pine forests; the author suggests this is probably due to a lack of suitable ponderosa pine forest in that area. In the Okanagan, Cannings et al. (1987) reported a high percentage of documented breeding Lewis's Woodpeckers in black cottonwood (*Populus balsamifera*), but attribute this partially to observer bias. In contrast, in the East Kootenay, Cooper and Beauchesne (2000) found low numbers of breeding pairs in black cottonwood stands despite the relative abundance of this habitat in some areas. This may have been because riparian cottonwood stands tend to be bordered by dense conifer stands rather than the open grasslands found in the Okanagan Valley and Thompson Basin (Cooper et al. 1998). In the Cariboo-Chilcotin, Lewis's Woodpecker use wide-spaced large diameter

Douglas-fir (*Pseudotsuga menziesii*) trees in the grasslands (grassland/Douglas-fir ecotone), and mature cottonwood groves. The different use of forest types may indicate that other structural components are more important than forest type for breeding habitat selection.

Sousa (1983) suggests that good Lewis's Woodpecker breeding habitat is positively correlated with increased shrub density, which supplies an abundance of insects (<25% shrub closure has no value, from 25 to 50% there is an increase in value, and >50% or greater is optimal). However, recently other researchers have found that Lewis's Woodpeckers selected breeding habitat with much lower shrub densities (i.e., 16.1% in Wyoming and 13.4% in California; Linders and Anderson 1998). This is more consistent with the habitat in the East Kootenay Trench, where the average percentage of cover by shrubs at nesting sites was 16.5% ($n = 109$; range 0–90%) (S.M. Beauchesne, unpubl. data). Most of the sites with a high shrub density ($n = 11$, average density 40%) were in the Dutch Creek burn, an area considered to be of limited future suitability to Lewis's Woodpecker because of conifer regeneration (Cooper and Gilles 2000). Excluding the Dutch Creek burn data, the shrub closure for the East Kootenay Trench was 14.4% (S.M. Beauchesne, pers. comm.).

Lewis's Woodpeckers nest in living and dead deciduous and coniferous trees in British Columbia with ponderosa pine (47% of 215 nests) and black cottonwood (33%) the most common nest trees reported (Campbell et al. 1990). Use of human-made structures such as utility poles (eight records from 215 nests), fence posts (one record from 215 nests; Campbell et al. 1990), and buildings (one record of a cavity in roof of a house; Beauchesne, pers. obs.) is also possible. Other tree species used in the Interior included domestic cherry and apple, ornamental maple, Douglas-fir, western larch (*Larix occidentalis*), trembling aspen (*Populus tremuloides*), alder, (*Alnus rubra*) paper birch (*Betula papyrifera*), ornamental willow, elm, and Lombardy poplar (Cannings et al. 1987; Cooper and Beauchesne 2000). Trees previously used for nesting in coastal

areas included Garry oak (*Quercus garryana*) and bigleaf maple (*Acer macrophyllum*) (Cooper et al. 1998). Garry oak (known as Oregon white oak in the United States) is still used to a large extent in Wasco County, Oregon (Galen 1989). In the Blue Mountains of Oregon and Washington, Lewis's Woodpecker used 72% cottonwood, 12% ponderosa pine (*Pinus ponderosa*), 10% juniper, 4% willow, and 2% fir for nesting ($n = 49$) (Thomas et al. 1979).

Lewis's Woodpeckers can excavate their own cavities, but will reuse old Lewis's Woodpecker, Northern Flicker (*Colaptes auratus*), or Hairy Woodpecker (*Picoides villosus*) nest holes or natural cavities (Tobalske 1997). Live trees and dead trees with

heartrot provide suitable nesting trees. Softer snags are preferred.

In British Columbia, nest heights ($n = 212$) ranged from 1.0 to 30.5 m with most nests (64%) recorded between 3.5 and 9.0 m (Campbell et al. 1990). In 1998, a nest cavity in a 1.6 m stump in the East Kootenay was only 60 cm above the ground, the lowest nest cavity height reported for Lewis's Woodpecker (Cooper and Beauchesne 2000).

The characteristics of Lewis's Woodpecker nest trees vary between locations (see Table 1), and dbh varies between nest tree species (see Table 2).

Table 1. Characteristics (mean \pm SD) of Lewis's Woodpecker nests trees

Location	Species	Citation	n	dbh (cm)	Height (m)	Nest height (m)
Colorado	Cottonwood	Vierling 1997	47	112.6 \pm 38.8	20.4 \pm 5.2	11.1 \pm 3.4
Wyoming	Ponderosa pine	Linder 1994	35	47.8 \pm 8.4	10.6 \pm 3.0	7.5 \pm 2.7
Sierra Nevada	Pine/fir forests	Raphael and White 1984	37	66.5		
British Columbia	Ponderosa pine and cottonwood	Campbell et al. 1990	215			1.0–30.0 range
Oregon	Oregon white oak and ponderosa pine	Galen 1989	53	66 \pm 20.8		
British Columbia	Ponderosa pine and Douglas-fir	Cooper and Beauchesne 2000	85	52 \pm 19.1		

Table 2. Dbh^a of Lewis's Woodpecker nest trees by species in the eastern foothills of Mount Hood in Oregon (Galen 1989) and in the East Kootenay of British Columbia (Cooper and Beauchesne 2000)

Tree Species	Oregon		British Columbia	
	n	dbh (cm)	n	dbh (cm)
Ponderosa pine	22	75.6 \pm 19.2	34	59.2 \pm 21.9
Douglas-fir	5	72.1 \pm 16.2	30	48.3 \pm 13.6
Black cottonwood	3	65.2 \pm 21.6	3	71.0 \pm 33.0
Oregon white oak	23	56.1 \pm 19.8		
Birch			4	47.5 \pm 13.4
Aspen			6	34.2 \pm 11.3
Western larch			3	47.0 \pm 9.9

^a Mean \pm SD.

Foraging

During the breeding season in British Columbia, foraging areas include breeding habitats, open forests and valley bottoms, deciduous groves near lakes and streams, burns, logged areas, agricultural habitats such as orchards and farms, rural gardens, and urban areas. In British Columbia in winter, foraging is generally restricted to residential areas, orchards, and mature cottonwood groves (Cannings et al. 1987).

Broken-topped or large-limbed living or dead trees are used as hawking perches.

Conservation and Management

Status

The Lewis's Woodpecker is on the provincial *Blue List* in British Columbia. It is considered a species of *Special Concern* in Canada (COSEWIC 2002).

Summary of ABI status in BC and adjacent jurisdictions (NatureServe Explorer 2002)

BC	AB	WA	ID	MT	Canada	Global
S3B, SZN	SH	S3B, SZN	S4B, SZN	S4B, SZN	N3	G4

Trends

Population trends

Breeding Bird Survey results for the period 1966 to 1999 indicate a significant decline (-2.3%/yr) in Lewis's Woodpecker populations across North America (Sauer et al. 2000). Declines of -2.2% were observed in western North America. Significant declines were noted in Montana (-5.2%) and Washington (-8.4%) (Sauer et al. 2000). Sauer et al. (2002) did not report a significant trend in British Columbia for the same period; however, sample sizes were likely too small to obtain significant results. Cooper et al. (1998) and Fraser et al. (1999) report that long-term population declines have been documented in British Columbia and that

populations may still be declining. Once abundant, populations on southeastern Vancouver Island and near Vancouver have been extirpated (Campbell et al. 1990).

Population size of Lewis's Woodpecker in the province was estimated to be a maximum of 600 pairs in 1990, but this estimate may have been conservative because some areas had not yet been surveyed (Fraser et al. 1999). For example, based on inventory work in 1997 and 1998 in the East Kootenay Trench, this region has a population estimate of 100–150 pairs (Cooper and Beauchesne 2000).

Habitat trends

Potential suitable habitat is undoubtedly declining as stands of mature ponderosa pine, Douglas-fir, and black cottonwood are harvested for timber, urban development, and firewood. Stands of old black cottonwood along the South Thompson River, east of Kamloops, have been severely impacted by cattle activity, urban development, and changing agricultural practices (Cooper et al. 1998). Helicopter logging of mature ponderosa pine still occurs in some areas where steep terrain and other access issues prevented their removal in the past. Some low-lying areas in the East Kootenay have been flooded by hydroelectric reservoirs (Cooper et al. 1998).

Intensive grazing may result in elimination of brushy or grassy forest understoreys, that may be important to Lewis's Woodpeckers. Forest fire suppression has resulted in encroachment by regenerating conifers into open ponderosa pine forests, which has reduced suitable habitat for Lewis's Woodpeckers.

Threats

Population threats

Competition with European Starlings may be a problem in some areas, but Lewis's Woodpeckers appear to be more successful in competing with starlings than other *Melanerpes* woodpeckers such as the Red-bellied Woodpecker (Cannings et al. 1987; Ingold 1994). Vierling (1998) recorded 78 inter-specific interactions between starlings and Lewis's

Woodpeckers during 418 hours of monitoring. Of the 59 Lewis' Woodpecker pairs, only one lost its nest cavity to starlings. In the Okanagan and the East Kootenay Trench, starlings and Lewis's Woodpeckers seem to be able to coexist, having been observed nesting in the same habitat, occasionally sharing a nest tree (Cannings et al. 1987; Cooper and Beauchesne 2000). In contrast, Sorenson (1986) found a correlation between the rapid increase of starlings in Salt Lake City and the rapid decline of Lewis's Woodpeckers. It is possible that the effects of competition depend on resource availability (i.e., number of cavities) and population size of the competitors (i.e., if Lewis's Woodpecker are vastly outnumbered by starlings and cavities are scarce, the energetic cost of competition may be too great).

Collisions with cars may be a cause of mortality in some areas (Tobalske 1997). Both members of a pair nesting close to Highway 95 were found dead by the road in 1997 (Cooper and Beauchesne 2000).

Habitat threats

Fire suppression in the Okanagan and other interior areas has resulted in dense stands of ponderosa pine and Douglas-fir in forest understoreys, making some stands unsuitable for Lewis's Woodpecker (Cooper et al. 1998). Vierling (1997) found that Lewis's Woodpeckers in southeastern Colorado avoided dense stands of trees at all times of the year. Other factors such as grazing, logging, and possibly climate change have resulted in many more younger and smaller trees, fewer older and larger trees, accumulation of fuel loads, reduced herbaceous production, and associated changes in ecosystem structure, fire hazard, and wildlife fauna (Covington and Moore 1994).

Loss of nest trees through logging and firewood collection is a significant threat. In coastal areas of southwestern British Columbia, the cutting of snags for firewood and as a WCB safety requirement for the Forest Service may have contributed to the decline and eventual extirpation of Lewis's Woodpeckers (Campbell et al. 1990). Removal of Garry Oak on Vancouver Island likely resulted in declines in numbers there (Fraser et al. 1999).

Use of insecticides and pesticides in orchards and gardens may reduce insect populations, an important food resource during the breeding season.

Legal Protection and Habitat Conservation

The Lewis's Woodpecker, its nests, and its eggs are protected in Canada and the United States under the *Migratory Birds Convention Act* and in British Columbia under the provincial *Wildlife Act*.

Several breeding sites are protected in provincial parks, ecological reserves, and wildlife management areas. According to MELP (1998), only 8% (i.e., 7731 ha) of potentially suitable Lewis's Woodpecker habitat in the south Okanagan is currently designated as conservation lands.

Remaining suitable lands are found on Crown land (34 999 ha; 37%); Indian Reserves (22 110 ha; 24%); and private land (27 975 ha; 30%). A number of new provincial parks have been announced in the south Okanagan through the Okanagan-Shuswap Land and Resource Management Plan process. Some of the more important parks for Lewis's Woodpecker include White Lake Grasslands and South Okanagan Grasslands.

The riparian and biodiversity guidelines under the results based code, particularly recommendations for wildlife tree retention, may partially address the requirements of this species. The feasibility of using the wildlife tree retention area recommendations or the wildlife habitat feature designation should be considered prior to establishing a WHA for this species and should be used to manage for individual pairs.

Identified Wildlife Provisions

Sustainable resource management and planning recommendations

- ❖ Maintain open forests, dominated by ponderosa pine, black cottonwood, or Douglas-fir, with some large snags and recruitment trees.
- ❖ Provide naturally vegetated linkages between riparian areas, semi-open forest, and reserve areas of similar quality.

- ❖ Consider the relative location and proximity of other preferred habitats (e.g., recent burns, partially logged areas showing low crown closures and desirable habitat attributes such as snags and large hardwoods, orchards, crop fields, or pastures).
- ❖ Since this species is largely dependent on wildlife trees, it is best managed through the wildlife tree retention objectives established within landscape level plans. Blocks should be assessed to identify potentially suitable WTR areas. Table 3 provides recommendations for wildlife tree retention objectives for this species.
- ❖ It is recommended that salvage not occur in WTR areas established to provide habitat for this species. In addition, these areas should be designed to include as many suitable wildlife trees as possible and maintained over the long term.

Wildlife habitat area

Goal

Maintain suitable nesting habitat for multiple pairs.

Feature

Establish WHAs over breeding aggregations of three or more pairs.

Size

Typically between 5 and 50 ha but will depend on area of suitable habitat.

Design

The WHA should contain open mature or old growth ponderosa pine or Douglas-fir forests, preferably with <25% canopy closure, with presence of large diameter dead or live snags (preferably ≥ 45 cm dbh; minimum 30 cm dbh) OR mature deciduous stands (e.g., paper birch, trembling aspen, and black cottonwood) with variable canopy closure (range from approximately 5–80% with presence of large trees (preferably ≥ 45 cm dbh; minimum 30 cm dbh).

General wildlife measure

Goals

1. Provide an adequate supply of large diameter live and dead wildlife trees suitable for foraging and nesting.
2. Maintain an open canopy.
3. Maintain the integrity of nesting habitat.
4. Maintain shrub cover.

Measures

Access

- Do not construct roads unless there is no other practicable option.

Harvesting and silviculture

- Do not harvest or salvage mature timber. When harvesting is approved, follow the measures below.

Table 3. Preferred wildlife tree patch features for the Lewis’s Woodpecker

Attribute	Characteristics
Size (ha)	variable; may be quite small (1 ha)
Location	if possible, on west side of valleys; proximity to large open areas important
Tree features	large dbh; evidence of heartrot infection or broken tops or limbs
Tree species	ponderosa pine; black cottonwood; Douglas-fir
Tree size (dbh)	in general: 55–80 cm; specifically: 66–87* cm ponderosa pine, 68–96* cm cottonwood, 52–66* cm Douglas-fir; in the absence of trees with the preferred dbh, trees ≥ 30 cm may be retained for recruitment
Wildlife tree class	2–4 for ponderosa pine; 4–7 for Douglas-fir (a mix would be ideal, but preference would be for lower end of decay range to maximize current suitability and longevity)

* Weighted mean pooled S.D.

- Protect and retain all ponderosa pine and black cottonwood live and dead trees ≥ 30 cm dbh for nesting, perching, and foraging.
- Maintain at least six standing dead trees per ha. Where it is not possible to retain six ≥ 45 cm, use the largest available. The highest practical density of snags is preferred. Hazardous snags or trees can be incorporated into group reserves (plan as no-work zones if appropriate); otherwise maintain snags within the operational setting as described in the *Wildlife/Danger Tree Assessor's Course Workbook*. Use partial cutting silvicultural systems to maintain widely spaced ($< 25\%$ canopy cover) late seral ponderosa pine and Douglas-fir.
- Topping large diameter snags may be appropriate in areas where standing dead trees are few.
- Additional potential nest sites in intensely managed stands may be provided by leaving some high-cut (5 m in height) stumps of large (≥ 45 cm dbh) ponderosa pine or black cottonwood.

Pesticides

- Do not use pesticides.

Range

- Limit browse utilization by livestock to no more than 10%.

Additional Management Considerations

Open forests resulting from regularly occurring burns provide prime nesting and foraging habitat for Lewis's Woodpeckers (Cooper and Beauchesne 2000). Naturally occurring fire regimes in the ponderosa pine and Douglas-fir biogeoclimatic zones should be encouraged, and where possible, fire suppression should be minimized. The use of prescribed burning is a potentially useful habitat management tool.

A high potential for habitat enhancement exists through a combination of mechanical removal of regenerating conifers and selective logging of mature timber. Planting of suitable "snags" in open habitats where natural snags are absent may be beneficial as well.

Maximize the number of snags retained in suitable habitats.

Implement protection measures to reduce the risk of stand-replacing fire. Encourage ground-fires that keep regenerating ponderosa pine and Douglas-fir in check but do not kill mature trees.

Use prescribed burning to create semi-open parkland habitats with sufficient grassland understorey to provide habitat for an abundance of insects, and presence of some snags for nesting.

Information Needs

1. Impacts of tree encroachment into open ponderosa pine habitats, and the role of fire suppression.
2. Information on the effect of cattle grazing on habitat quality and the role that starlings play in Lewis's Woodpecker population levels.
3. Inventories in the Fraser River Basin and the Pavilion Ranges ecosections where populations are poorly documented.

Cross References

Bighorn Sheep, Fringed Myotis, "Great Basin" Gopher Snake, "Interior" Western Screech-Owl, Racer, White-headed Woodpecker, ponderosa pine/bluebunch wheatgrass – silky lupine

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