COSEWIC
Assessment and Update Status Report

on the

Red-headed Woodpecker
Melanerpes erythrocephalus

in Canada

THREATENED
2007

COSEWIC
COMMITTEE ON THE STATUS OF
ENDANGERED WILDLIFE
IN CANADA

COSEPAC
COMITÉ SUR LA SITUATION
DES ESPÈCES EN PÉRIL
AU CANADA

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For additional copies contact:

COSEWIC Secretariat
c/o Canadian Wildlife Service
Environment Canada
Ottawa, ON
K1A 0H3

Tel.: 819-953-3215
Fax: 819-994-3684
E-mail: COSEWIC/COSEPAC@ec.gc.ca
http://www.cosewic.gc.ca

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COSEWIC
Assessment Summary

Assessment Summary – April 2007

Common name
Red-headed Woodpecker

Scientific name
Melanerpes erythrocephalus

Status
Threatened

Reason for designation
The brightly coloured woodpecker of open deciduous forests of southeastern Canada and southern parts of western Canada has experienced a significant population decline over the long-term associated with habitat loss and the removal of dead trees in which it nests. There is no evidence to suggest that the population trend will be reversed.

Occurrence
Saskatchewan, Manitoba, Ontario, Quebec

Status history
Designated Special Concern in April 1996. Status re-examined and designated Threatened in April 2007. Last assessment based on an update status report.

COSEWIC
Executive Summary

Red-headed Woodpecker
Melanerpes erythrocephalus

Species information

The Red-headed Woodpecker is approximately 20 cm long and is easily recognized by its crimson head, neck, throat, and upper breast, which contrast with its white underparts and black upperparts. Large white patches, formed by the inner secondaries and tertials, are visible on the wings. The two sexes are similar in appearance. The young can be distinguished by the colour of their heads and necks and the upper part of their breasts, which range from brownish-grey to crimson.

Distribution

The Red-headed Woodpecker occurs only in North America. In Canada, its range includes southern Saskatchewan, Manitoba, Ontario, and Quebec. In the United States, it ranges from the Great Plains to New England and south to the Gulf states. The Red-headed Woodpecker regularly winters in the southern two-thirds of its breeding range.

Habitat

The Red-headed Woodpecker is found in a variety of habitats, including oak and beech forests, grasslands, forest edges, orchards, pastures, riparian forests, roadsides, urban parks, golf courses, cemeteries, beaver ponds and burns.

Biology

The Red-headed Woodpecker is monogamous. Clutch size varies from three to seven eggs, with an average of four. Both sexes incubate and incubation generally lasts 12 to 14 days. The young remain in the nest for 27 to 30 days. The Red-headed Woodpecker is probably the most omnivorous species of woodpecker in North America, feeding on insects in summer and on acorns and beechnuts in winter.

Population sizes and trends

Population estimates based on the Breeding Bird Survey (BBS) suggest the current population of Red-headed Woodpeckers in Canada is approximately 5,000 breeding pairs or 10,000 mature individuals. This is, however, likely to be a maximum.

Minimum estimates suggest that the population could be as low as 700 breeding pairs or 1,400 mature individuals. In Canada, long-term trend analyses based on BBS data show a significant decline of 3.4%/year between 1968 and 2005, which amounts to a 70% decrease in the population over the last 37 years. Short-term analyses based on the same methods show a non-significant decline of 0.70%/year between 1995 and 2005. At this rate of decline the population would have decreased by 7% in the most recent 10-year period. Ontario Breeding Bird Atlas data suggest that Red-headed Woodpecker populations in that province have declined by 64% between 1985 and 2005. A continuing decline in population is expected with the ongoing loss and degradation of habitat (see below).

Limiting factors and threats

Historically, one of the main reasons for the decline of the Red-headed Woodpecker was the significant reduction in the vast stands of mature hardwoods, such as oak and beech, following European settlement. These trees produced an abundance of acorns and nuts, the species' primary food source in winter. More recent threats include loss of nesting and roosting sites as large dead trees are removed from urban and agricultural areas and also the reduction in beechnuts, an important food source through the winter, as American beech trees succumb to disease.

Special significance of the species

This species is important to the maintenance of biodiversity because the cavities it excavates in trees provide sleeping and nesting sites for many other species. It also plays a significant role in maintaining the deciduous forest ecosystems of eastern North America by dispersing large quantities of acorns and beechnuts during feeding.

Existing protection

Globally, the Red-headed Woodpecker species is considered secure by the IUCN. In Canada, the species, its nests, and its eggs are protected under the *Migratory Birds Convention Act, 1994*. COSEWIC designated the species as Special Concern in 1996. NatureServe ranks the species as critically imperiled in Saskatchewan, secure and vulnerable in Manitoba, vulnerable in Ontario, and threatened in Quebec. In Ontario, the Ministry of Natural Resources has designated it a species of special concern and it appears on the provincial species at risk list. In Quebec, the species is on the list of species of vertebrate wildlife likely to be designated threatened or vulnerable.

COSEWIC HISTORY

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) was created in 1977 as a result of a recommendation at the Federal-Provincial Wildlife Conference held in 1976. It arose from the need for a single, official, scientifically sound, national listing of wildlife species at risk. In 1978, COSEWIC designated its first species and produced its first list of Canadian species at risk. Species designated at meetings of the full committee are added to the list. On June 5, 2003, the *Species at Risk Act* (SARA) was proclaimed. SARA establishes COSEWIC as an advisory body ensuring that species will continue to be assessed under a rigorous and independent scientific process.

COSEWIC MANDATE

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) assesses the national status of wild species, subspecies, varieties, or other designatable units that are considered to be at risk in Canada. Designations are made on native species for the following taxonomic groups: mammals, birds, reptiles, amphibians, fishes, arthropods, molluscs, vascular plants, mosses, and lichens.

COSEWIC MEMBERSHIP

COSEWIC comprises members from each provincial and territorial government wildlife agency, four federal entities (Canadian Wildlife Service, Parks Canada Agency, Department of Fisheries and Oceans, and the Federal Biodiversity Information Partnership, chaired by the Canadian Museum of Nature), three non-government science members and the co-chairs of the species specialist subcommittees and the Aboriginal Traditional Knowledge subcommittee. The Committee meets to consider status reports on candidate species.

DEFINITIONS

Wildlife Species	A species, subspecies, variety, or geographically or genetically distinct population of animal, plant or other organism, other than a bacterium or virus, that is wild by nature and is either native to Canada or has extended its range into Canada without human intervention and has been present in Canada for at least 50 years.
Extinct (X)	A wildlife species that no longer exists.
Extirpated (XT)	A wildlife species no longer existing in the wild in Canada, but occurring elsewhere.
Endangered (E)	A wildlife species facing imminent extirpation or extinction.
Threatened (T)	A wildlife species likely to become endangered if limiting factors are not reversed.
Special Concern (SC)*	A wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.
Not at Risk (NAR)**	A wildlife species that has been evaluated and found to be not at risk of extinction given the current circumstances.
Data Deficient (DD)***	A category that applies when the available information is insufficient (a) to resolve a species' eligibility for assessment or (b) to permit an assessment of the species' risk of extinction.

* Formerly described as "Vulnerable" from 1990 to 1999, or "Rare" prior to 1990.

** Formerly described as "Not In Any Category", or "No Designation Required."

*** Formerly described as "Indeterminate" from 1994 to 1999 or "ISIBD" (insufficient scientific information on which to base a designation) prior to 1994. Definition of the (DD) category revised in 2006.

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The Canadian Wildlife Service, Environment Canada, provides full administrative and financial support to the COSEWIC Secretariat.

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SPECIES INFORMATION

Name and classification

The common name for *Melanerpes erythrocephalus* Linnaeus (1758) is Red-headed Woodpecker. The French name is “pic à tête rouge”. The taxonomy of this species is as follows:

Class: Aves
Order: Piciformes
Family: Picidae
Genus: *Melanerpes*
Species: *erythrocephalus*

According to Short (1982), there are no recognized subspecies of the Red-headed Woodpecker. Although there is clinal variation in size (Smith *et al.* 2000).

Morphological description

The Red-headed Woodpecker shows the highest degree of monomorphism of all woodpecker species in North America, with the two sexes having identical plumage (Kilham 1978, 1983). A medium-sized bird (length 19.4–23.5 cm; massweight 56–91 g), both the male and female have a crimson head, neck, throat, and upper breast, contrasting with their white underparts and black upperparts. Large white patches, formed by the inner secondaries and tertials, are visible on the wings. The tail is generally black, except for the outermost rectrices, which are white. The upper tail and the rump are also white. The bill is light grey, becoming darker terminally. The iris is reddish-brown in adults. The legs and feet are olive grey (Smith *et al.* 2000).

During their first fall and winter, immatures can be distinguished from adults by the colour of their head, neck, and upper breast, which ranges from greyish-brown to crimson red (with little or no brown coloration). The secondaries are white and can be distinguished from those of adults by a subterminal black band (complete in juvenile plumage but variable after prebasic moult). The underparts of immatures are generally whitish with variable amounts of dusky streaking, especially on the flanks. The back and tail are generally brownish-black, and the iris is greyish-brown (Smith *et al.* 2000).

Genetic description

To date, there have been no molecular studies published on *M. erythrocephalus*. A single unpublished study was carried out to determine the relationship between the Red-headed Woodpecker and other species of *Picidae* (A. Fry pers. comm. in Smith *et al.* 2000). Mitochondrial DNA sequences of the Red-headed Woodpecker suggest that this species is closely related to several other members of the genus *Melanerpes* that occur in the Caribbean, in particular Puerto Rico (*M. portoricensis*) and Guadeloupe (*M. herminieri*). This study also suggests that the Red-headed Woodpecker is not as

closely related to the Acorn Woodpecker (*M. formicivorus*) as was suggested by Mayr and Short (1970) and Short (1982).

DISTRIBUTION

Global range

The Red-headed Woodpecker occurs only in North America. Its range extends northward to the southern parts of Saskatchewan, Manitoba, Ontario, and Quebec; westward to the eastern parts of Montana, Wyoming, Colorado and the centre of New Mexico; southward to the Texas panhandle to the Gulf states of Louisiana, Mississippi, Alabama, and Florida; and eastward to the Atlantic seaboard states of Georgia, South Carolina, North Carolina, Virginia, Delaware, Maryland, New Jersey, New York, Connecticut, Massachusetts and Vermont (Smith *et al.* 2000, Figure 1). Its range is concentrated primarily in the midwest U.S. states (Smith *et al.* 2000, Figure 2).

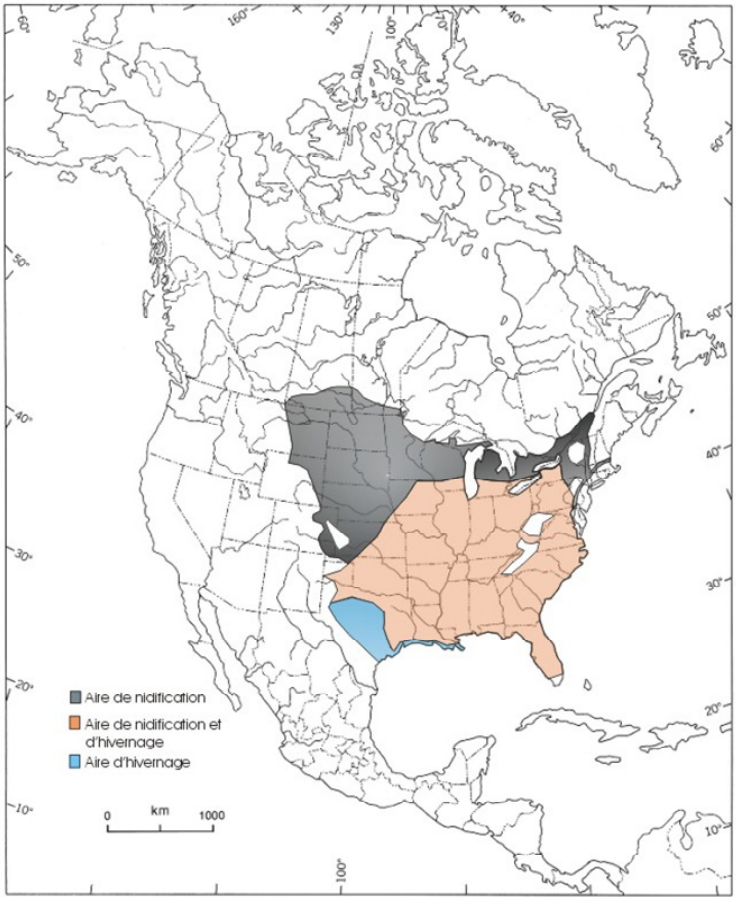

Figure 1. Distribution of the Red-headed Woodpecker in North America, from Smith *et al.* (2000) (Legend: breeding range, breeding and wintering range, wintering range)

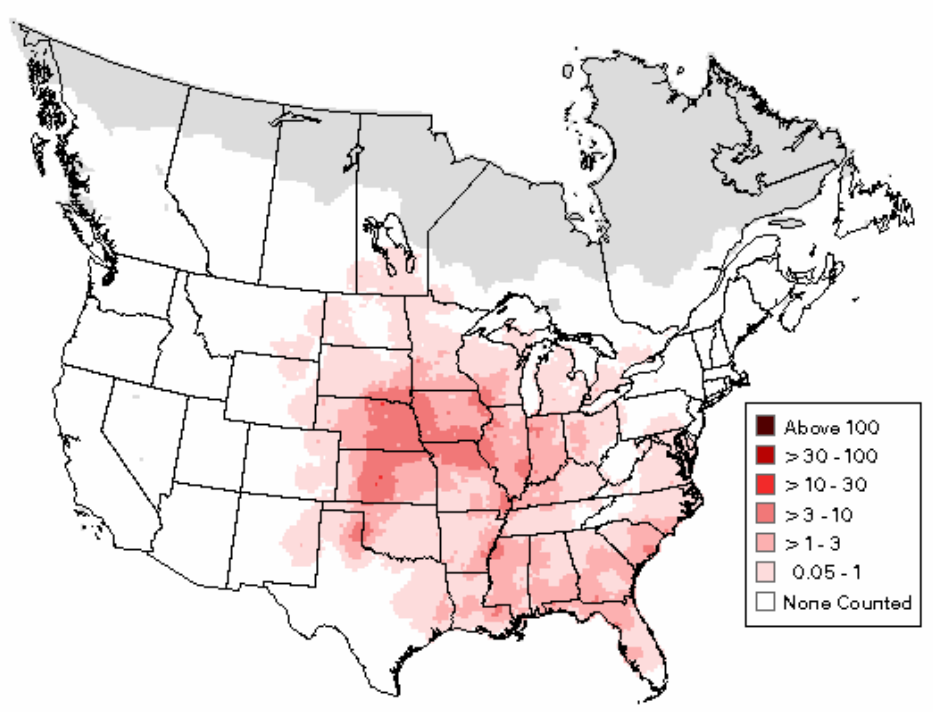

Figure 2. Relative abundance of the Red-headed Woodpecker in North America derived from the North American Breeding Bird Survey (taken from Sauer *et al*. 2005).

The Red-headed Woodpecker winters regularly in the southern two-thirds of its breeding range and rarely north of it (American Ornithologist's Union 1998, Figure 1). The bird's wintering range seems closely linked to the annual production of acorns and beechnuts, which varies widely by region from one year to the next (Smith *et al.* 2000). During migration, it selects overwintering sites according to the density of acorns and beechnuts. If the supply at a given site is not sufficient to last the whole winter, Red-headed Woodpeckers will continue their migration and ultimately choose sites where food resources are sufficiently abundant. The Red-headed Woodpecker uses central Texas and southern Louisiana only as a wintering area (Figure 1).

Canadian range

Breeding Bird Survey data from the 1990s indicate that 0.8% of the North American breeding population of the Red-headed Woodpecker occurs in Canada. Its Canadian range generally includes southern Saskatchewan, southern Manitoba, southwestern Ontario, and southwestern Quebec (Cadman *et al.* 1987; Gauthier and Aubry 1995; Smith 1996; Manitoba Avian Research Committee 2003, Figure 1). The species was an occasional breeder in New Brunswick in the late 1800s (Squires 1976) and now appears to be only a rare annual visitor (S. Blaney pers. comm. 2005). It is considered accidental in British Columbia, southern Alberta, and Nova Scotia (Godfrey 1986; Campbell *et al.* 1990; Erskine 1992; Semenchuk 1992). In winter, the Red-headed Woodpecker is

occasional in southern Manitoba and southern Ontario, and is rare and irregular in Quebec, New Brunswick, Nova Scotia, and southern Alberta (Godfrey 1986; Cyr and Larivée 1995). Winter sightings usually involve individuals visiting feeding sites in urban areas as well as agricultural areas (Cyr and Larivée 1995; Page 1996).

In Saskatchewan, the Red-headed Woodpecker breeds very locally south of Prince Albert, particularly in the Cypress Hills, in surrounding prairies and in aspen parkland to the east (Godfrey 1986; Smith 1996). There is also evidence of breeding near the confluence of the Red Deer and South Saskatchewan rivers from the early 1990s (B. Korol pers. comm. 2007). In breeding bird atlas surveys in this province, Red-headed Woodpecker breeding was reported in 3% of the province (24 squares). Breeding was confirmed in 8% of squares, and considered probable and possible in 12.5% and 79% of the squares, respectively (Smith 1996).

In Manitoba, the species occurs mainly in the southern part of the province, particularly in the areas of Dauphin, Winnipeg and Sprague, but appears absent from areas dominated by boreal forest (Manitoba Avian Research Committee 2003). The species' range encompasses approximately 14% of the province (P. Taylor pers. comm. 2005), corresponding mainly to agricultural areas and wooded grasslands (Page 1996).

In Ontario, the species' distribution is continuous in the southern part of the province, particularly south of Georgian Bay. It is uncommon in the Canadian Shield, near large urban centres, such as Toronto and Hamilton, and in certain intensively farmed areas (Page 1996). The species is also a regular breeder, albeit in small numbers, in northwestern Ontario (i.e., Lake of the Woods area) and eastern Ontario, along the Ottawa River Valley (Cadman *et al.* 1987).

In Quebec, the Red-headed Woodpecker is rare and is now only an occasional breeder in the regions bordering the southern St. Lawrence valley, such as the Outaouais, Montreal, Montérégie, and the Eastern Townships (Gauthier and Aubry 1995).

The Red-headed Woodpecker has never been a regular breeder in the Maritime provinces (Erskine 1992). The only confirmed breeding record in these provinces comes from near St. John, New Brunswick and dates from 1881 (Chamberlain 1882c in Squires 1976). Recent records for New Brunswick are mainly of non-breeders observed in the central and northern parts of the province (Erskine 1992).

In Canada, the Extent of Occurrence (EO) of this species is estimated at 317,580 km² (values calculated on the basis of NatureServe 2006, P. Blancher unpubl. data), which corresponds to less than 6% of the species' total breeding area. The species Area of Occupancy (AO) ranges from i) 217 – 595 km^2 assuming a minimum population size of 700 pairs and territories ranging from a minimum of 3.1 ha to a maximum of 8.5 ha (Venables and Collopy 1989 in Smith *et al*. 2000) and ii) 1,550 – 4,250 km^2 assuming the maximum population size of 5,000 pairs and the same range of territory sizes. Based on these estimates the AO for this species could range from a minimum of 217 km^2 to a maximum of 4,250 km^2.

HABITAT

Habitat requirements

General

The Red-headed Woodpecker occurs in open deciduous forests, particularly those dominated by oak and beech (Reller 1972), flood plain forests, grasslands, forest edges, orchards, pastures along rivers and roads, urban parks, golf courses, cemeteries, beaver ponds and timber stands that have been treated with herbicides (Short 1982; Godfrey 1986; Smith *et al.* 2000). It also occurs in recent burns and cutovers (Godfrey 1986). The open areas where this species breeds usually contain a high density of dead trees that can be used for nesting and perching. In agricultural forestry areas, it prefers forests with shrub cover grazed by livestock and with a high snag density (Smith *et al.* 2000; Harris *et al.* 2002).

Migration habitat

Little information is available on the Red-headed Woodpecker's habitat during migration (Smith *et al.* 2000). However, the species has been reported to make extensive use of shelterbelts during its spring migration on the Great Plains (Martin 1960 in Smith *et al.* 2000) and is also found in fruit-tree orchards and urban areas. This species makes more use of forest edges in the fall (Twomey 1945 in Smith *et al.* 2000). In Ontario, it uses wooded areas and scrubby thickets, as well as the shorelines of some of the Great Lakes (Page 1996). In Manitoba, the Red-headed Woodpecker is generally found in open deciduous woodland with numerous dead or sick trees, as well as in urban parks (Manitoba Avian Research Committee 2003).

Winter habitat

In the northern part of its wintering range, the Red-headed Woodpecker occurs mainly in open, mature woodlands, such as oak stands, oak-hickory stands, maple stands, ash stands and beechwoods (Smith *et al.* 2000). The presence of this species in these various stands is correlated with the abundance of acorns and beechnuts (Smith *et al.* 2000). In winter, unlike in other seasons, the Red-headed Woodpecker makes more use of the inner parts of the forest and is less abundant along its edges (DeGraaf *et al.* 1980). In most Canadian provinces and in the northeastern states, wintering records of this species mainly involve individuals at feeding stations in areas consisting mostly of oak forest or farmland (Cyr and Larivée 1995; Page 1996). In southern states, such as Florida, the species usually prefers pine stands and mixed pine-oak stands, but also makes use of flooded forests, which have a high density of snags (Lochmiller 1979 in Smith *et al.* 2000).

Habitat trends

Red-headed Woodpecker habitat declined with the massive deforestation of the mature hardwood forests (Page 1996; Smith *et al.* 2000; Manitoba Avian Research

Committee 2003). The main cause of habitat loss is the decline in dead trees and branches in urban and agricultural areas. In rural areas, the disappearance of potential nesting sites was also due to firewood cutting, clear-cutting, intensive farming, the loss of riparian forests, and chanelling of rivers (Smith *et al.* 2000). Other factors that have contributed to the reduction in Red-headed Woodpecker habitat in North America include reforestation of a large area of farmland in the eastern United States, which results in young forests, the loss of small orchards, forest fire suppression, the disappearance of the American chestnut (*Castanea dentata*) in many U.S. states, and intensive farming practices involving the removal of hedgerows and the use of large monoculture fields (Smith *et al.* 2000). In Manitoba, the recent disappearance of this species from many city parks would appear to be due partly to the systematic removal of dead trees and partly to natural falling of these trees and grazing in riparian areas (Page 1996; Manitoba Avian Research Committee 2003). No quantitative studies have been conducted on habitat trends for Ontario or Quebec, but it is reasonable to believe that the known causes of habitat decline elsewhere in North America apply to these provinces.

On wintering sites, habitat also appears to be declining due to the significant reduction (i.e., over 60% since the start of the 20th century) of large expanses of forest in the southeastern United States (NatureServe 2006). In addition, fungal diseases, such as beech bark disease complex (caused by *Cryptococcus fagisuga* Lind. and *Nectria coccinea* var. *faginata* Lohman, Watson, and Ayers), could also have contributed substantially to the decline in Red-headed Woodpecker habitat in eastern North America (Houston and O'Brien 1998).

Habitat protection/ownership

In Canada, most habitat suitable for the Red-headed Woodpecker is privately owned, although there is significant habitat in publicly owned areas such as city parks and golf courses. The protected public lands where the Red-headed Woodpecker is regularly found include certain national parks and national historic sites in Manitoba and Ontario, such as Bruce Peninsula National Park, Navy Island National Historic Site, Point Pelee National Park, Riding Mountain National Park, and the Trent-Severn Waterway. The species is also probably present in Fathom Five National Marine Park and St. Lawrence Islands National Park (P. Achuff pers. comm. 2005). Certain provincial parks in Manitoba and Ontario are also of major importance in the conservation of Red-headed Woodpecker populations. For example, in Ontario, the Rondeau Important Bird Area was created in part because of the large population of this species in Rondeau Provincial Park (Cheskey and Wilson 2001). Although the Important Bird Areas of Canada represent only a small proportion of the protected lands in Canada, they do protect a large portion of the Red-headed Woodpecker's breeding range, particularly in Ontario and Manitoba (IBA Canada 2004). For example, approximately 100 breeding pairs have been reported in the Kinosota-Leifur Shoreline Important Bird Area in Manitoba (Manitoba Avian Research Committee 2003).

BIOLOGY

General

Although many recent studies have focused on the use of habitat by communities of excavating bird species, including the Red-headed Woodpecker, there has been no in-depth study of a specific population, and many aspects of the ecology of this species have yet to be discovered (Smith *et al.* 2000).

Reproduction

The Red-headed Woodpecker is monogamous (Smith *et al.* 2000). The age of sexual maturity is one year (Belson 1998) and the generation time is estimated at 3 to 5 years (according to the maximum age of 9 years (Clapp *et al.* 1983) and age of maturity). Nests are usually excavated by males in large snags (> 31 cm) or in dead branches of live trees at a height generally exceeding 7 m and in stumps at least 11 m in height (Smith *et al.* 2000).

Incubation occurs between May and June, depending on the location (Peck and James 1983). Typically a single brood is reared per season, but a second brood is regularly raised in the southern part of its range (Ingold 1987; Smith *et al*. 2000). Throughout its breeding range, clutch size ranges from three to seven eggs, with an average of four (Short 1982; Peck and James 1983; Godfrey 1986; Smith *et al.* 2000). Both sexes incubate the eggs. Incubation generally lasts 12 to 14 days (Short 1982; Smith *et al.* 2000). The young hatch asynchronously and remain in the nest for 27 to 30 days, during which time they are tended by both parents (Jackson 1976; Smith *et al.* 2000). The average number of fledglings is 2.1 for a first attempt and 2.3 for a second (Ingold 1989). The fledglings are dependent on their parents for about 25 days after leaving the nest (Jackson 1976; Smith *et al.* 2000).

Survival

Martin (1995) reports an annual adult survival rate of 62%. The winter mortality rate is reported to be 7% (Doherty *et al.* 1996). Nesting success varies from 80% (n = 59 nests with at least 1 fledgling) in Mississippi (Ingold 1989) to 48.4% (n = 33 nests) in Arkansas (Withgott 1994).

Dispersal/migration

Only Red-headed Woodpecker populations from the northern and western parts of North America make fall migrations. The abundance and distribution of acorns and beechnuts in regions further south are believed to influence the start of migration and the selection of wintering sites (Smith and Scarlett 1987).

The Red-headed Woodpecker generally exhibits nest site fidelity (Ingold 1991). In Mississippi, 33% of banded adults (15 out of 45) returned to the vicinity of their previous

year's nest (Ingold 1991). In Florida, one adult male moved 1.04 km between two consecutive breeding seasons (Belson 1998). In Canada, two adult birds first captured during the spring migration were recaptured, presumably at their nest sites, the following year - 240 and 251 km, respectively, from their capture sites (Brewer *et al.* 2000).

Belson (1998) reports that for three juvenile Red-headed Woodpeckers monitored in Florida, initial dispersal from their natal territories varied from 0.11 to 0.67 km. In Mississippi, out of total of 69 birds banded as nestlings, none returned to the site around their nest tree (Ingold 1991).

Diet and feeding habits

The Red-headed Woodpecker is probably the most omnivorous woodpecker species in North America and relies on both plant (67%) and animal (33%) food (Smith *et al.* 2000). Its diet includes a wide variety of cultivated and wild fruit (apples, pears, cherries, raspberries, and strawberries), as well as corn and several types of mast (such as acorns and beechnuts) (Short 1982; Smith *et al.* 2000). The animal portion of its diet consists mainly of insects, such as grasshoppers, crickets, ants, several types of beetles and their larvae, butterflies, caterpillars, wasps, and domesticated bees (*Apis mellifera*) (Short 1982; Smith *et al.* 2000). The Red-headed Woodpecker also feeds on bird eggs, young birds, and occasionally adult birds, as well as small rodents, lizards, and dead fish (Smith *et al.* 2000). In winter, its diet becomes more specialized, focusing on acorns and beechnuts, as well as grains, such as corn (Williams and Batzli 1979). In winter this species will also frequently visit bird feeders to eat sunflower seeds, peanut butter, and suet (animal fat) (Short 1982; Smith *et al.* 2000).

The Red-headed Woodpecker forages on a variety of substrates and generally prefers live trees, foraging mainly on trunks and branches (Smith *et al.* 2000). In summer, the Red-headed Woodpecker captures most of its animal prey — i.e., insects — by "flycatching" — flying out from a perch to catch them in the air (Jackson 1976; Venables and Collopy 1989 in Smith *et al.* 2000). In winter, this species forages on the ground, as well as in trees and shrubs where it looks for small fruits and insects (Root 1988). Once it has established its winter territory, the Red-headed Woodpecker feeds mainly on acorns that it finds on the ground and in trees, storing them in cavities that it excavates for this sole purpose (Kilham 1983).

Interspecific interactions

The Red-headed Woodpecker is the most pugnacious of all North American woodpeckers and is often seen driving away other species of birds, to protect either its nest or its food caches (Smith *et al.* 2000). The most heavily documented instances of interspecies aggression involve the European Starling (*Sturnus vulgaris*) and the Red-bellied Woodpecker (*Melanerpes carolinus*), two species whose nesting behaviour is similar to that of the Red-headed Woodpecker.

The proportion of Red-headed Woodpecker nest cavities usurped by starlings varies from 7% to 15% (Ingold 1989). Red-headed Woodpeckers are often more aggressive than starlings and can successfully force starlings to abandon a usurped cavity (Ingold 1989, 1994). The short breeding season of starlings and the tendency for later nesting by Red-headed Woodpeckers reduce the competition between the species (Ingold 1989, 1994; Koenig 2003).

The Red-bellied Woodpecker offers the Red-headed Woodpecker serious competition for supplies of mast in fall and winter. Williams and Batzli (1979) have shown that the Red-bellied Woodpecker changes its horizontal distribution and uses different habitats when the Red-headed Woodpecker is present in the same area. On the scale of the nesting site, the Red-bellied Woodpecker also seems to be affected negatively by the Red-headed Woodpecker's presence. In Mississippi, for instance, six breeding pairs of Red-bellied Woodpeckers lost their nests to the Red-headed Woodpecker (Ingold 1989).

Bock *et al.* (1971) note that Red-headed Woodpeckers are dominant over Lewis's Woodpeckers (*Melanerpes lewis*) at their own cavities. The Red-headed Woodpecker's absence from Colorado in the winter is probably due to food competition from Lewis's Woodpecker (Smith *et al.* 2000).

Other species commonly driven off by the Red-headed Woodpecker are the Downy Woodpecker (*Picoides pubescens*), the Tufted Titmouse (*Baeolophus bicolor*), the Blue Jay (*Cyanocitta cristata*), and the White-Breasted Nuthatch (*Sitta carolinensis*) (Smith *et al.* 2000).

Home range and territory

The species' summer territories range in size from 3.1 to 8.5 ha (Venables and Collopy 1989 in Smith *et al.* 2000).

Adult as well as juvenile Red-headed Woodpeckers are territorial in winter, aggressively defending well-defined individual territories against both interspecific and intraspeciific competition (Williams and Batzli 1979; Kilham 1983). The adult winter territories are usually small, ranging from 0.2 to 2.0 ha (Kilham 1958; Moskovits 1978; Williams and Batzli 1979).

Behaviour/adaptability

During the breeding season, the Red-headed Woodpecker's dependence on tree cavities for nesting gives it little flexibility to respond to human disruptions that either reduce the density of dead trees or eliminate them altogether (Smith *et al.* 2000).

POPULATION SIZES AND TRENDS

Search effort

The North American Breeding Bird Survey (BBS) is a large-scale survey that monitors population trends for birds in North America (Sauer *et al.* 2005). Surveys are conducted by volunteer birders at 50 three-minute stops at 0.8-km intervals along 39.4 km survey routes. At each stop, every bird seen or heard within a 400-m radius is recorded (Downes *et al.* 2005). This survey has proven to be a relatively effective means of monitoring Red-headed Woodpecker populations, because the majority of the survey routes are located in urban areas and their surroundings where this species is usually present (Sauer *et al.* 2005). Moreover, this species is highly vocal during the BBS survey period and can therefore be readily detected during the surveys (Cadman *et al.* 1987; Smith *et al.* 2000).

The Christmas Bird Count (CBC) is the largest and oldest program for monitoring winter bird populations in North America (i.e., 1900-2004, Sauer *et al.* 1996). In late December of each year, more than 40,000 volunteers record all species that they encounter within circles 24 km in diameter located throughout North America (Sauer *et al.* 1996). Although a summary of the data is available for 1900 to 2004 (National Audubon Society 2005), trend analyses are available only for 1958 to 1988 (Sauer *et al.* 1996). Trends are corrected for search effort by dividing the number of birds observed by the number of observer-party hours (Sauer *et al.* 1996). CBC data provide a measure of changes in abundance of wintering populations over time for this species.

The Ontario Breeding Bird Atlas project for 1981-1985 (Cadman *et al.* 1987) and 2001-2005 is an important source of data for estimating Red-headed Woodpecker population trends in this province. A comparison of the abundance index (i.e., the number of 10 km x 10 km squares per 100 km x 100 km block surveyed where the species was observed, divided by the total number of squares per block surveyed) of the two survey periods provides Red-headed Woodpecker population trends over a 20-year period. The methodology used in this project has proven effective for surveying this species because it is easily detectable by its call during the breeding season (Smith *et al.* 2000) and because it occurs mainly in agricultural areas in the southern part of the province, which was very well covered in both of the atlas surveys (Cadman *et al.* 1987).

In Quebec, the SOS-POP has surveyed birds at risk since 1994. This database is co-ordinated by the *Association québécoise des groupes d'ornithologues* (Quebec association of birdwatchers' groups) and the Canadian Wildlife Service (CWS). Birds at risk are monitored chiefly by members of Quebec birdwatching clubs, who fill out observation sheets for each visit to determine species presence (F. Shaffer pers. comm. 2007).

The Canadian Migration Monitoring Network monitors populations of migrating passerines at monitoring stations across Canada (Environment Canada 2004). The main activities at these stations consist of banding birds and visually tracking migratory

birds. The densities of migrating Red-headed Woodpeckers in Canada are probably too low for most stations to monitor this species effectively. There are currently nine monitoring stations in the Red-headed Woodpecker's breeding range, one of which—Long Point Bird Observatory—has enough data to estimate long-term seasonal trends (Bird Studies Canada 2006).

Abundance

Rich *et al.* (2004) estimated the North American population of Red-headed Woodpeckers at approximately 2.5 million breeding individuals (i.e., 1.3 million breeding pairs). This estimate was derived from relative abundance counts on BBS routes, which were then converted to population estimates based on an estimate of an effective detection distance of 200m for Red-headed Woodpeckers. It was assumed that on average one member of a pair within detection distance was detected in each three-minute BBS count. There have been no new surveys to determine Red-headed Woodpecker abundance in Canada since the last status report on this species (Page 1996). The abundance estimates in the current report are based primarily on data derived from BBS trend estimates and on the knowledge of provincial experts and the results of various provincial atlas projects.

According to BBS-based population estimates, the total Canadian population in the 1990s was approximately 10,500 breeding pairs (P. Blancher unpubl. data), occurring primarily in Ontario and Manitoba. Assuming the Canadian population has declined by 48% since 1994, as suggested by BBS trend indices (see below), the current population of Red-headed Woodpeckers in Canada would be about 5,000 pairs.

Information from the recent Ontario Breeding Bird Atlas suggests a minimum of 500 pairs (based on presence/absence in 10 X 10 km squares; M. Cadman pers. comm. 2007) and a maximum of 1,900 pairs (based on extrapolations from atlas point counts; P. Blancher pers. comm. 2007) in Ontario. In Manitoba, the minimum population estimate is approximately 200 pairs (based on community knowledge; K. De Smet pers. comm. 2007; P. Taylor, pers. comm. 2007) and a maximum of 2,700 pairs (based on an estimate of 5,800 in the 1990s from BBS counts and a loss of about 53% since then (BBS trend indices); P. Blancher, pers. comm. 2007). There are an estimated 0-5 pairs occurring in Quebec (F. Shaffer, pers. comm. 2005). Together, these estimates suggest that the population of Red-headed Woodpeckers in Canada could range from a minimum of 700 pairs or 1,400 mature individuals to a maximum of 5,000 pairs or 10,000 individuals.

Density estimates for this species come primarily from the United States. In the southeastern United States, breeding densities of the Red-headed Woodpecker range from 2.3 pairs/40 ha $\pm$ 0.43 (n = 16) to 24 pairs/40 ha (Kilham 1983; Hamel 1992 in Smith *et al.* 2000). Interestingly, in Illinois, 5 pairs/40 ha were reported in areas that had not been hit by severe outbreaks of Dutch elm disease and 24 to 63.8 pairs/40 ha following an outbreak in areas of high snag density (Kendeigh 1982).

In winter, densities range from 8.4 individuals/40 ha in upland forest (Graber and Graber 1979) to 34.2 individuals/40 ha in mature bottomland forest (Graber and Graber 1977 in Smith *et al.* 2000).

Fluctuations and trends

Historic and qualitative trends

North America

Red-headed Woodpecker populations have fluctuated widely since the first European settlers arrived in North America (Smith *et al.* 2000). The species was abundant in the 18th and 19th centuries, when it benefited from the large-scale clearing of the forests of the eastern and central United States (Smith *et al.* 2000). In the early 20th century, however, these populations declined continuously, because of the disappearance of the extensive mature forests dominated by oak and beech that had produced large quantities of acorns and beechnuts. Although Red-headed Woodpecker populations rose again throughout its range between the 1950s and the 1970s following the death of large numbers of elms and chestnuts from fungal diseases (Smith *et al.* 2000), they seem to have fallen again since 1980 (Page 1996). According to some authors, this decline is the result of the systematic felling of dead trees for firewood and the natural collapse of elm snags affected by Dutch elm disease in agricultural areas (Smith *et al.* 2000). In urban areas, the removal of dead trees and branches is believed to be an important factor in the loss of the species' habitat (Smith *et al.* 2000).

Canada

Quebec

The Red-headed Woodpecker was probably more abundant in Quebec in the 19th century than in the late 1970s (Ouellet 1974). This species also seems to have been a regular breeder at certain sites on Montreal Island, such as Mount Royal, where it nested for a long period (i.e., 1936 to 1968) (Ouellet 1974). It occupied 29 sites from 1960 to 1996, compared with only 7 from 1997 to 2004 (SOS-POP, F. Shaffer pers. comm. 2005). There are no breeding records for Quebec in 2002 or 2003, which suggests that it is now only a sporadic breeder in this province (SOS-POP, F. Shaffer pers. comm. 2005).

Ontario

Although there are no historical data on Red-headed Woodpecker numbers in Ontario, this species was once regarded as relatively abundant in the southern parts of this province (Macoun and Macoun 1909; Taverner 1919). However, it began to decline in the early 1900s, and by the 1960s, its numbers had already declined to an alarming extent in many parts of its range where it was once common, such as North Bay, Lake Nipissing, Kingston, Point Pelee National Park (Peck and James 1983; Page 1996).

Manitoba

Although considered rare to uncommon in the 1800s, Red-headed Woodpecker populations increased rapidly in the early 1900s, peaking in about the 1960s (Manitoba Avian Research Committee 2003). In the 1980s, populations in this province appeared to decline and several local populations disappeared (P. Taylor pers. comm. 2005), while others have declined by at least 50% (Page 1996).

Saskatchewan

There are few historical data that could be used to identify a long-term trend for Saskatchewan. However, this species is believed to have been more abundant before the introduction of the European Starling (Smith 1996).

Recent and quantitative trends

North American Breeding Bird Survey

Long-term BBS data from the species' North American breeding range indicate a significant decline of 2.6%/year in Red-headed Woodpecker populations between 1966 and 2005 ($P \leq 0.001$, n = 1311 routes, Sauer *et al.* 2005). This corresponds to a population decline of 66% across North America since 1966. The decline is most pronounced in the northern and mid-western United States (Figure 3).

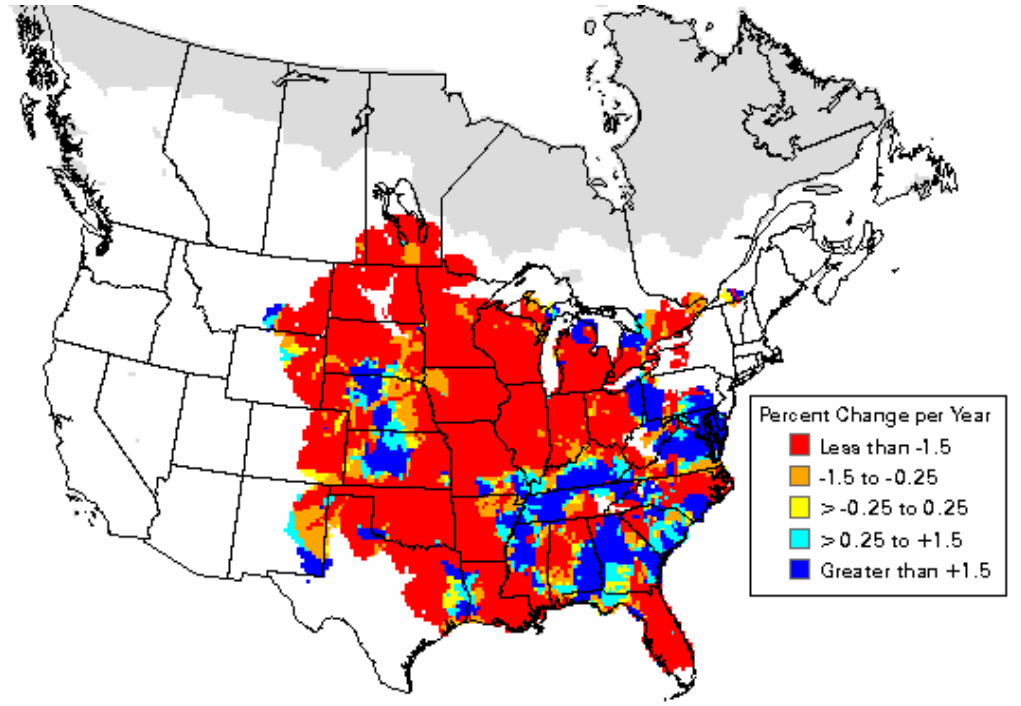

Figure 3. Percent change in Red-headed Woodpecker abundance in North America according to the Breeding Bird Survey (based on Sauer *et al*. 2005).

In Canada, long-term BBS data show a significant decline of 3.4%/year (P<0.05, n = 69) for this species between 1968 and 2005, which amounts to a 70% decline in the population. Short-term BBS data show a non-significant decline of 0.70%/year (P>0.10, n = 36) between 1995 and 2005 (Figure 4; Downes *et al.* 2005). At the latter rate of decline, Red-headed Woodpecker populations in Canada would have decreased by about 7% in the most recent 10-year period.

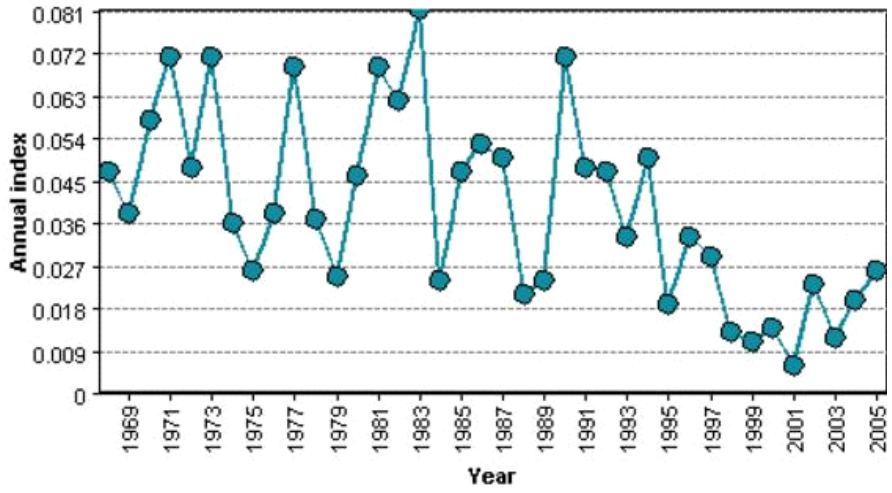

Figure 4. Annual index of abundance for the Red-headed Woodpecker between 1968 and 2005 in Canada according to the Breeding Bird Survey (based on Downes *et al.* 2005)

Christmas Bird Count

Abundance indices derived from CBC data for Red-headed Woodpeckers in Canada between 1960 and 2005 show a relatively stable, albeit fluctuating trend between 1960 and the mid-1980s, followed by a declining trend (Figure 5). For the period between 1958 and 1988, where trend analyses have been conducted, CBC data show a decline of 1.0%/year (n.s., n = 1107, Sauer *et al.* 1996) in North America as a whole and an increase of 0.3%/year (n.s., n = 41 Sauer *et al.* 1996) for Ontario, the only province with sufficient CBC survey circles to estimate a trend.

Ontario Breeding Bird Atlas

In Ontario, the percent of squares occupied by Red-headed Woodpeckers between the two atlas projects (i.e., 1980-1985 and 2000-2005) declined by 64% (A. Darwin unpubl. data), with severe declines in the Carolinian and Simcoe-Rideau Regions, the core breeding area in Ontario (effort adjusted: 47% fewer squares in the Carolinian Region, 30% fewer squares in the Simcoe-Rideau Region; L. Friesen pers. comm. 2007). The decline of the species in this province is also apparent from the comparison of the abundance indices for the two periods (i.e., the number of survey squares in which the species was observed fell in 33 of the survey blocks between atlas periods and rose in only 3; 2-tailed Wilcoxon signed rank sum test = -4.5, $P \leq 0.001$) (C. Savignac, unpubl. data).

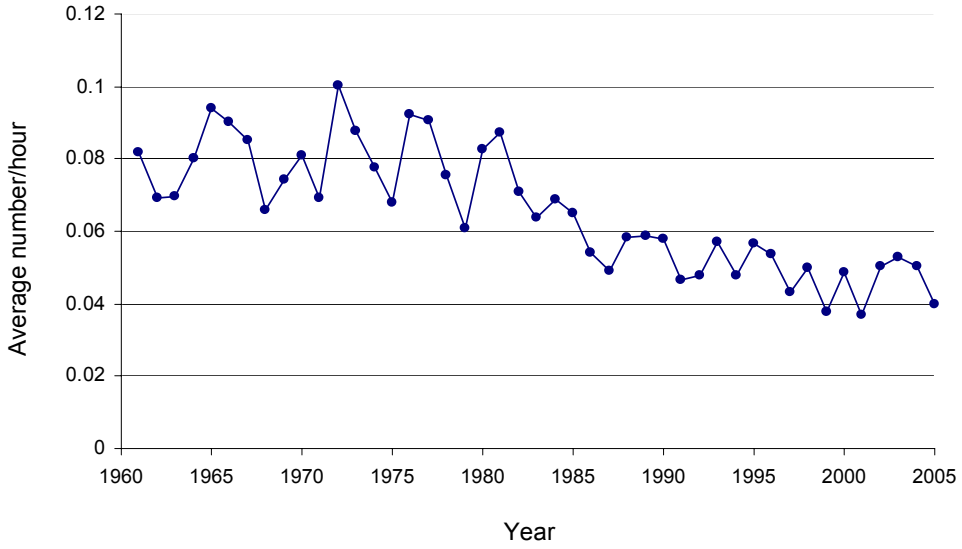

Figure 5. Red-headed Woodpecker population trends in Canada for the period 1961-2005 according to the Christmas Bird Count (National Audubon Society 2005).

Canadian Migration Monitoring Network

Between 1961 and 2004, Red-headed Woodpecker counts at Long Point Bird Observatory showed significant declines of 3.4%/year for the spring counts and 2.1%/year for the fall counts (Bird Studies Canada 2006).

Rescue effect

In Canada, the Red-headed Woodpecker is at the northern limit of its range and on the periphery of larger populations in bordering U.S. states, so an influx of individuals from these populations is possible. This hypothesis is supported by the relatively high frequency of individuals observed in fall and winter in several Canadian provinces where this species is not a breeder. Rescue from the U.S. is expected to be limited, however, because Red-headed Woodpecker populations in the U.S. have declined by 2.6%/year between 1966 and 2005 (see above), with 42.3% of states showing negative trends (Sauer *et al.* 2005).

LIMITING FACTORS AND THREATS

Historically, one of the main reasons for the decline of the Red-headed Woodpecker was the loss of vast expanses of mature hardwood forests, such as oak and beech in the central and eastern United States following European settlement (Smith *et al.* 2000). These forests produced an abundance of acorns and beechnuts, the Red-headed Woodpecker's main food source in winter.

A more recent and important limiting factor has been the loss of nest sites and roosting cavities as dead elms and chestnut trees were cleared from urban and agricultural areas (Page 1996). The loss of beech forests, which provide a primary food source, to diseases, such as beech bark disease complex, have also contributed significantly to the species' decline (Houston and O'Brien 1998). It is also worth noting that beech bark disease complex appears to be expanding in Ontario (Canadian Forest Service 2001), which includes a large part of the Red-headed Woodpecker breeding range. These factors together may result in continuing population declines for this species in Canada.

Red-headed Woodpecker declines have also been associated with mortality from collisions with motor vehicles while they forage by roadsides (Smith *et al*. 2000) and also from pesticide/chemical exposure (Smith *et al.* 2000). For instance, a Red-headed Woodpecker population on Manitoulin Island disappeared following pesticide use in the mid-20th century (Page 1996). Similarly, high mortality has been reported among hatchlings in nests built in telephone poles that had recently been treated with creosote (Smith *et al.* 2000).

SPECIAL SIGNIFICANCE OF THE SPECIES

The Red-headed Woodpecker is a primary excavating species whose old cavities are used for nesting by other species of birds (Sedgwick 1997). Hence, protection of its preferred nesting habitat (i.e. large dead trees in urban and agricultural areas) would increase bird diversity.

In winter, the Red-headed Woodpecker's habit of storing large quantities of mast in hardwood forests is also an important factor in the dispersal of certain tree species.

EXISTING PROTECTION OR OTHER STATUS DESIGNATIONS

In Canada, the Red-headed Woodpecker, its nest, and its eggs are protected under the *Migratory Birds Convention Act, 1994*.

Globally, NatureServe (2006) considers this species to be secure (G5; Table 1). It is listed on the IUCN Red List of Threatened Species as Near Threatened (BirdLife International 2004). In the United States, this species is ranked as secure (NatureServe national conservation status ranks N5B and N5N; Table 1). The species is considered critically imperiled (S1) or imperiled (S2) in 7 states, vulnerable in 10 states, and apparently secure or secure in 18 states (NatureServe 2006).

In Canada, the Red-headed Woodpecker has been designated Special Concern by COSEWIC (Page 1996). The General Status of Species in Canada gives the species an overall rank of 2 or May be at Risk in Canada. It assigns a rank of 2 for Red-headed Woodpeckers in SK, MB, ON and QC (CESCC 2006). NatureServe (2006) ranks its

populations as apparently secure to vulnerable (Table 1). In Saskatchewan, NatureServe ranks the species as critically imperiled (Table 1). In that province, the species has no designated status (Saskatchewan Environment 2006). In Manitoba, NatureServe ranks the species as both vulnerable and apparently secure (NatureServe 2006; Table 1), but the species is not listed provincially (Manitoba Wildlands 2006). In Ontario, NatureServe ranks the species as vulnerable (Table 1). However, the Ontario Ministry of Natural Resources has designated it a species of special concern (Ontario Ministry of Natural Resources 2005). In Quebec, NatureServe ranks the species as imperiled (Table 1), and it is on the list of vertebrate wildlife species that are "likely to be designated as threatened or vulnerable" since 1993 (Quebec Department of Natural Resources and Faune Québec 2006).

Partners in Flight (Rich *et al.* 2004) considers the Red-headed Woodpecker to be a species of national importance due to the past decline and future threats facing the species. In addition, there are management plans designed to double the size of the breeding populations in two avifaunal biomes: the Prairie Avifaunal Biome and the Eastern Avifaunal Biome (Rich *et al*. 2004). Partners in Flight has designated the species a species of regional importance in 18 bird conservation regions, including three regions in Canada (Prairie Potholes, Lower Great Lakes/St. Lawrence Plain, Boreal Hardwood Transition) (Rich *et al.* 2004).

Table 1. Ranks of the Red-headed Woodpecker in North America as assessed by NatureServe (2006).

Region	Status*
World	G5
United States	N5BN5N
Canada	N3N4B
Saskatchewan	S1B
Manitoba	S2S3
Ontario	S3B
Quebec	S2

*S1 indicates that a species is critically imperiled because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation; S2 indicates that a species is imperiled because of rarity or other factors making it very vulnerable to extirpation, usually with 6 to 20 occurrences or few individuals remaining (i.e. 1,000 to 3,000); S3 indicates that a species is vulnerable in the nation or state/province because it is rare or uncommon, or found only in a restricted range, or because of other factors making it vulnerable to extirpation; S4 indicates a species is uncommon but not rare; some cause for long-term concern due to population declines or other factors; S5 indicates that a species is secure because it is common, widespread, and abundant in the nation or state/province; G is a global status rank; N is a national status rank; S is a subnational (state or province) status rank; B refers to breeding populations; N refers to non-breeding populations.

TECHNICAL SUMMARY

Melanerpes erythrocephalus
Red-headed Woodpecker Pic à tête rouge
Range of Occurrence in Canada: Saskatchewan, Manitoba, Ontario, Quebec

Extent and Area Information	
• *Extent of occurrence (EO)(km²)* Calculated on the basis of the map of NatureServe 2006	317,580 km²
• *Specify trend in EO*	Declining
• *Are there extreme fluctuations in EO?*	No
• *Area of occupancy (AO) (km²)* Range based on minimum territory size of 3.1 ha with a minimum population size of 700 pairs and a maximum territory size of 8.5 ha with a maximum population estimate of 5,000 breeding pairs	217 – 4,250 km^2
• *Specify trend in AO*	Declining
• *Are there extreme fluctuations in AO?*	Unlikely
• *Number of known or inferred current locations*	N/A
• *Specify trend in #*	N/A
• *Are there extreme fluctuations in number of locations?*	N/A
• *Specify trend in area, extent or quality of habitat*	Declining
Population Information	
Generation time (average age of parents in the population)	3–5 years
• *Number of mature individuals* Minimum based on Ontario Breeding Bird Atlas and community knowledge (700 pairs) Maximum based on BBS population estimates (5,000 pairs)	1,400 -10,000
• *Total population trend:*	Declining
% decline over the last/next 10 years or 3 generations Based on BBS trend estimates: - decline of 70% between 1968 and 2005 - decline of 7% between 1995 and 2005	7%
• *Are there extreme fluctuations in number of mature individuals?*	Unlikely
• *Is the total population severely fragmented?*	No
• *Specify trend in number of populations*	N/A
• *Are there extreme fluctuations in number of populations?*	N/A
• *List populations with number of mature individuals in each:* N/A	
Threats (actual or imminent threats to populations or habitats)	
• Elimination of potential nest and roosting sites (i.e., large snags) in agricultural and urban areas • Loss of food source (beechnuts) through large-scale infection of beech forests by beech bark disease	
Rescue Effect (immigration from an outside source)	
• *Status of outside population(s)?* USA: BBS data indicate a significant negative population trend throughout the United States	
• *Is immigration known or possible?*	Yes
• *Would immigrants be adapted to survive in Canada?*	Yes
• *Is there sufficient habitat for immigrants in Canada?*	Yes, but declining
• Is rescue from outside populations likely?	Limited rescue because of declining populations in the U.S.

Quantitative Analysis	N/A
Current Status COSEWIC: Special Concern (1996) Threatened (2007)	

Status and Reasons for Designation

Status: Threatened	**Alpha-numeric code**: C1
Reasons for Designation: This brightly coloured woodpecker of open deciduous forests of southeastern Canada and southern parts of western Canada has experienced a significant population decline over the long-term associated with habitat loss and the removal of dead trees in which it nests.. There is no evidence to suggest that the population trend will be reversed.	
Applicability of Criteria **Criterion A**: (Declining Total Population): Does not meet criterion. **Criterion B**: (Small Distribution, and Decline or Fluctuation): Does not meet criterion. **Criterion C**: (Small Total Population Size and Decline): Meets Threatened C1 because there are <10,000 mature individuals and a decline of at least 10% is probable in the next 10 years. **Criterion D**: (Very Small Population or Restricted Distribution): Does not meet criterion. **Criterion E**: (Quantitative Analysis): None available.	

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AUTHORITIES CONSULTED

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BIOGRAPHICAL SUMMARY OF REPORT WRITER

Carl Savignac is the director of Dendroica Environnement et Faune, an environmental consulting firm that specializes in studies on threatened species and biodiversity and assessments of the impacts of petroleum, mining, and forestry projects on wildlife. Carl has been studying birds for 15 years and has conducted numerous field studies in several provinces and territories of Canada. He is the author of a number of scientific publications and reports on the woodpeckers, raptors, and passerines of Canada's temperate and boreal forest.