

COSEWIC
Assessment and Status Report

on the

Sage Thrasher
Oreoscoptes montanus

in Canada



ENDANGERED
2010

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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COSEWIC Assessment Summary

Assessment Summary – November 2010

Common name

Sage Thrasher

Scientific name

Oreoscoptes montanus

Status

Endangered

Reason for designation

In Canada, this species occurs in British Columbia, Alberta and Saskatchewan. Its Canadian population is extremely small, ranging from 7 to 36 individuals depending on the year. Populations in adjacent parts of the U.S., which are a likely source of birds for Canada, are declining. In addition, the sagebrush habitat necessary for breeding is decreasing, particularly in British Columbia, where the species is a regular breeder.

Occurrence

British Columbia, Alberta, Saskatchewan

Status history

Designated Endangered in April 1992. Status re-examined and confirmed in November 2000 and November 2010.



COSEWIC
Executive Summary

Sage Thrasher
Oreoscoptes montanus

Wildlife species description and significance

The Sage Thrasher is the only member of the genus *Oreoscoptes*, and is likely more closely related to the mockingbirds in the genus *Mimus* than to other thrashers. It is smaller than an American Robin, with a relatively short bill and tail compared to other thrashers. Both sexes show drab greyish-brown above with grey-brown stripes below; the face appears streaked with a whitish supercilium and black streaks on the sides of the throat. The song is a long, musical series of warbling notes. No subspecies are recognized. The Sage Thrasher is one of a small suite of bird species dependent on sagebrush habitats for their existence.

Distribution

The Sage Thrasher breeds from extreme southern British Columbia, southeastern Alberta, southwestern Saskatchewan, central Idaho and south-central Montana south through the Great Basin and western Great Plains to northeastern Arizona, west-central and northern New Mexico, northern Texas, and western Oklahoma. The Sage Thrasher winters from central California, southern Nevada, northern Arizona, central New Mexico and central Texas south to central Mexico.

Habitat

Sage Thrashers breed in shrub-steppe environments dominated by sagebrush. While the size of the shrubs is not important for foraging, large sagebrush (ca. 1 m high) is preferred for nesting. Some habitat has been lost in Canada over the past few decades, but the major loss has been in the United States where more than half of the sagebrush ecosystem has been converted to agriculture.

Biology

Sage Thrashers return to Canada in spring and early summer, building bulky nests of sticks in large sagebrush. They lay four or five eggs in the nest, and raise two broods in one season, at least in the central part of the breeding range. In spring and summer they feed largely on insects, especially grasshoppers and beetles, switching to a mixed diet of berries and insects in late summer and early fall.

Population sizes and trends

The Canadian breeding population varies year to year from lows of about seven adults to highs of about 36; the highest estimated population in the past century was around 30 pairs or 60 individuals. Breeding Bird Survey data from the Columbia Plateau of the United States, a likely source of birds for the British Columbia population, indicate that the population in this area has declined by approximately 33% over the most recent 10-year period (1997-2007) or three generations.

Limiting factors and threats

All threats relate to habitat quality and quantity. There are imminent threats to all habitat on private lands and Indian Reserves in the south Okanagan and Similkameen valleys; sagebrush habitats on these lands are likely to be converted to intensive agriculture (mostly vineyards), housing, and golf courses. Overgrazing has been a problem in the past, because it reduces the size of sagebrush and promotes the establishment of annual grasses, particularly Cheatgrass, which reduces habitat suitability for Sage Thrashers. About a third of the historic habitat has been developed.

Protection, status and ranks

COSEWIC assessed the Sage Thrasher as Endangered in November 2000; it is currently listed as Endangered under Schedule 1 of the federal *Species at Risk Act*. The Sage Thrasher and its nests and eggs are protected in Canada and the United States from hunting and collecting by the *Migratory Birds Convention Act* (1994). It is also protected in British Columbia, Alberta and Saskatchewan under their respective provincial wildlife acts. The Sage Thrasher is on the British Columbia Conservation Data Centre's Red List of potentially threatened or endangered species, and is included in the Category of Species at Risk under the Identified Wildlife Management Strategy of the provincial *Forest and Range Practices Act* (2004). The Sage Thrasher is ranked globally as G5. In Saskatchewan and British Columbia it is S1B (critically imperiled). It is listed in Alberta as Status Undetermined (S?). Adjacent states have ranked it as follows: Washington S3; Idaho S5, and Montana S3.

TECHNICAL SUMMARY

Oreoscoptes montanus

Sage Thrasher

Moqueur des armoises

Range of occurrence in Canada (BC, AB, SK):

Demographic Information

Generation time (usually average age of parents in the population; indicate if another method of estimating generation time indicated in the IUCN guidelines(2008) is being used)	Unknown, but likely around 3 yrs
Is there an [observed, inferred, or projected] continuing decline in number of mature individuals?	Unknown, but possible given declines in habitat
Estimated percent of continuing decline in total number of mature individuals within [5 years or 2 generations]	Unknown
[Observed, estimated, inferred, or suspected] percent [reduction or increase] in total number of mature individuals over the last [10 years, or 3 generations]	Unknown
[Projected or suspected] percent [reduction or increase] in total number of mature individuals over the next [10 years, or 3 generations].	Unknown
[Observed, estimated, inferred, or suspected] percent [reduction or increase] in total number of mature individuals over any [10 years, or 3 generations] period, over a time period including both the past and the future.	Unknown
Are the causes of the decline clearly reversible and understood and ceased?	No
Are there extreme fluctuations in number of mature individuals?	No

Extent and Occupancy Information

Estimated extent of occurrence Based on convex polygon around sites in BC, AB and SK that have been occupied at some point over the last 20 years	4500 km ²
Index of area of occupancy (IAO) (Always report 2x2 grid value; other values may also be listed if they are clearly indicated (e.g., 1x1 grid, biological AO)). Based on 2x2 grid over sites in BC and AB, where breeding has occurred	40 km ²
Is the total population severely fragmented?	No
Number of "locations*" The species occurs annually at three sites in BC, White Lake, Chopaka and Kilpoola – each site is potentially threatened by wildfires Locations are unknown for AB and SK, but not likely to be more than one at any given time	Likely fewer than 5
Is there an [observed, inferred, or projected] continuing decline in extent of occurrence?	No
Is there an [observed, inferred, or projected] continuing decline in index of area of occupancy?	Possible
Is there an [observed, inferred, or projected] continuing decline in number of populations?	No
Is there an [observed, inferred, or projected] continuing decline in number of locations?	No

* See definition of location.

Is there an [observed, inferred, or projected] continuing decline in [area, extent and/or quality] of habitat?	Yes, area of breeding habitat declining in Okanagan and Similkameen valleys of BC, suitable habitat likely declining in AB and SK
Are there extreme fluctuations in number of populations?	No
Are there extreme fluctuations in number of locations*?	No
Are there extreme fluctuations in extent of occurrence?	No
Are there extreme fluctuations in index of area of occupancy?	No

Number of Mature Individuals (in each population)

Population	N Mature Individuals
BC	6-24
Prairies	1-12
Total	7-36

Quantitative Analysis

Probability of extinction in the wild is at least [20% within 20 years or 5 generations, or 10% within 100 years].	None conducted
--	----------------

Threats (actual or imminent, to populations or habitats)

- Habitat loss and degradation from agricultural and urban development, and invasive grasses - Fire
--

Rescue Effect (immigration from outside Canada)

Status of outside population(s)? Declining in Columbia Plateau of U.S. that is likely source of birds for BC and at very low densities in Montana	
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 limited
Is rescue from outside populations likely?	Yes, but limited

Current Status

COSEWIC: Endangered (November 2010)

Status and Reasons for Designation

Status: Endangered	Alpha-numeric code: B1ab(ii,iii)+2ab(ii,iii); C2a(i); D1
Reasons for designation: In Canada, this species occurs in British Columbia, Alberta and Saskatchewan. Its Canadian population is extremely small, ranging from 7 to 36 individuals depending on the year. Populations in adjacent parts of the U.S., which are a likely source of birds for Canada, are declining. In addition, the sagebrush habitat necessary for breeding is decreasing, particularly in British Columbia, where the species is a regular breeder.	

Applicability of Criteria

Criterion A (Decline in Total Number of Mature Individuals): No trend information available for population in Canada.
Criterion B (Small Distribution Range and Decline or Fluctuation): Meets Endangered B1ab(ii,iii)+2ab(ii,iii) because EO is < 5000 km ² and IAO is < 500 km ² and likely exists at < 5 locations; and there is a projected continuing decline in the index of area of occupancy and habitat quality.
Criterion C (Small and Declining Number of Mature Individuals): Meets Endangered C2a(i) because the total number of mature individuals is < 2500 and a decline is inferred from continuing declines in habitat quality; and no population is estimated to contain > 250 individuals.
Criterion D (Very Small or Restricted Total Population): Meets Endangered D1 because the population is estimated to have < 250 mature individuals.
Criterion E (Quantitative Analysis): None conducted



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 (2010)

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.

COSEWIC Status Report

on the

Sage Thrasher *Oreoscoptes montanus*

in Canada

2010

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WILDLIFE SPECIES DESCRIPTION AND SIGNIFICANCE

Name and classification

Scientific name: *Oreoscoptes montanus*

English name: Sage Thrasher

French name: Moqueur des armoises

Classification: Class Aves

The Sage Thrasher (Figure 1) is the only member of the genus *Oreoscoptes*, and is probably more closely related to the mockingbirds of the genus *Mimus* than to thrashers in the genus *Toxostoma* (Reynolds *et al.* 1999). No subspecies are recognized.



Figure 1. Sage Thrasher. Photo by Richard J. Cannings.

Morphological description

The Sage Thrasher is a small thrasher, slightly smaller than an American Robin (*Turdus migratorius*), with a relatively short bill and tail. Both sexes are drab greyish-brown above with grey-brown stripes below; the face appears streaked with a whitish supercilium and black streaks on the sides of the throat. The song is a long, musical series of warbling notes.

Population spatial structure and variability

There have been no studies of the genetic structure of Sage Thrasher populations. The British Columbia range is narrowly contiguous with the breeding range in the United States. Breeding densities in Alberta, Saskatchewan and adjacent Montana are exceedingly low.

Designatable units

In Canada, Sage Thrashers occur in two National Ecological Areas (Southern Mountains and Prairies). However, the habitats used within these areas are similar; there are no subspecies described for the Sage Thrasher, and no information on other distinctions between the BC and Prairie birds. This report thus treats the species as a single designatable unit in Canada.

Special significance

The Sage Thrasher is one of a small suite of bird species dependent on sagebrush habitats for their existence. A monotypic species in a monotypic genus, it has been disappearing from local sites over the past century as sagebrush rangelands have been converted to intensive agriculture or burned to remove shrub cover.

Several bird species that share the arid shrub-steppe environment with Sage Thrashers are also species of concern in Canada. The Greater Sage-Grouse *phaios* subspecies (*Centrocercus urophasianus phaios*) is listed as Extirpated under the federal *Species at Risk Act*, while the Greater Sage-Grouse *urophasianus* subspecies is listed as Endangered. In British Columbia, Lark Sparrows (*Chondestes grammacus*) and Brewer's Sparrows (*Spizella breweri*) are on the provincial Red List of candidate species for threatened or endangered status.

DISTRIBUTION

Global range

The Sage Thrasher breeds from extreme southern British Columbia, central Idaho and south-central Montana south through the Great Basin to northeastern Arizona, west-central and northern New Mexico, northern Texas, and western Oklahoma (Figures 2 and 3) (American Ornithologists' Union 1998). It also breeds, at least irregularly, in southeastern Alberta and southern Saskatchewan (Godfrey 1986, O'Shea 1988, Smith 1996). The Sage Thrasher winters from central California, southern Nevada, northern Arizona, central New Mexico and central Texas south to central Mexico (American Ornithologists' Union 1998; Figure 2).



Figure 2. Distribution of the Sage Thrasher (adapted from Reynolds *et al.* 1999).

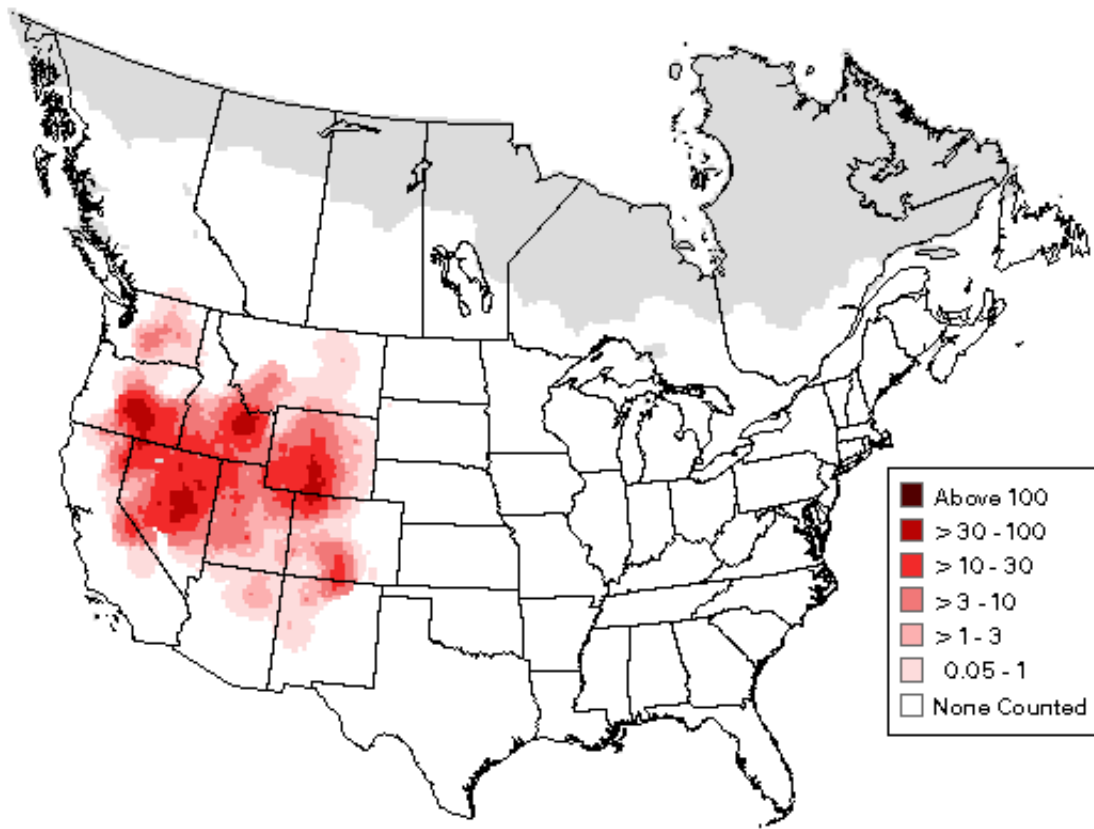


Figure 3. Breeding distribution of the Sage Thrasher, showing relative population densities derived from Breeding Bird Survey data, 1966-2003 (Sauer *et al.* 2008). Grey area at top of map indicates area not covered by the Survey.

Canadian range

In Canada, the Sage Thrasher breeds regularly in the southern Similkameen and Okanagan valleys of British Columbia (Godfrey 1986) (Figure 4) and, at least recently, in southeastern Alberta (O'Shea 1988, Federation of Alberta Naturalists 1992, 2007, Knapton 2010). It breeds irregularly in southwestern Saskatchewan (Eastend and Govenlock Prairie Farm Rehabilitation Administration (PFRA) Pastures; Godfrey 1986) (Figure 5). Less than 1 percent of the species' breeding range is in Canada.



Figure 4. Distribution of Sage Thrasher in British Columbia. Red circles indicate sites with breeding activity since 2000; yellow squares indicate historical (<1980) breeding sites; white circles indicate sites where thrashers have been seen during the breeding season but no confirmed breeding reported. Not shown here are a few breeding season sightings and one breeding record from the Lillooet area.

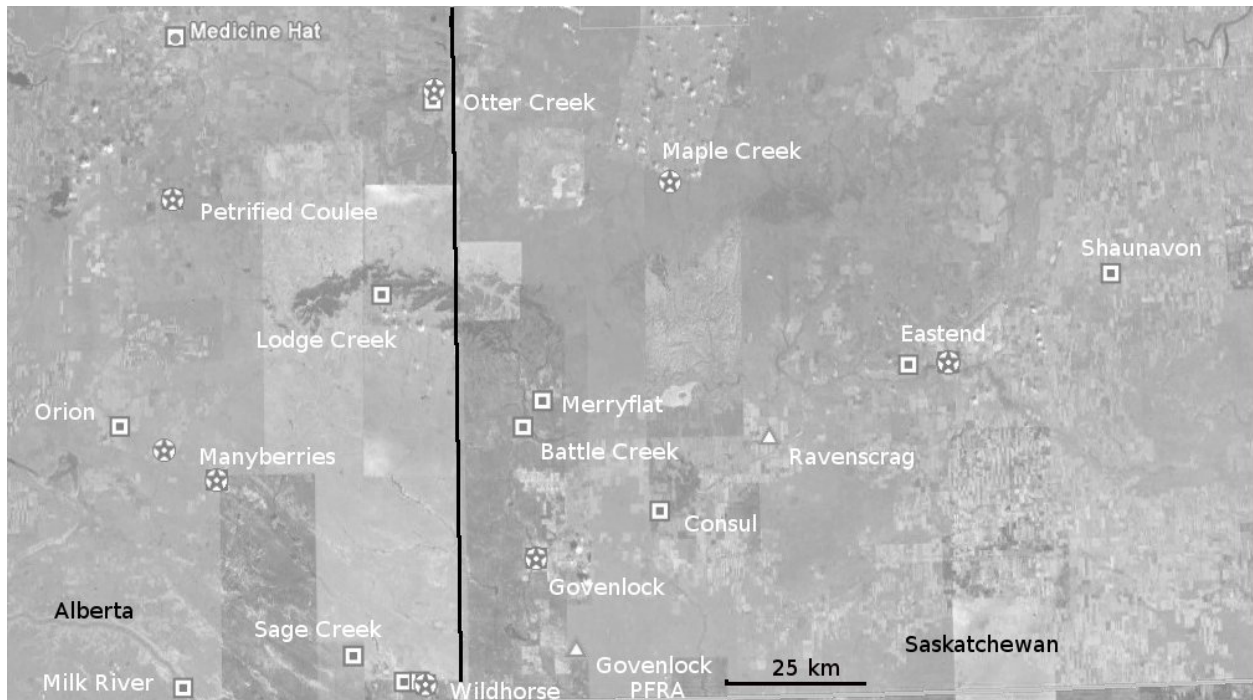


Figure 5. Distribution of Sage Thrasher records from southeastern Alberta and southwestern Saskatchewan. Stars indicate known breeding sites; squares indicate miscellaneous breeding-season sightings.

In British Columbia, most records come from the lower Similkameen Valley and south Okanagan Valley, where they are seen annually near the Chopaka Customs and Kilpoola Lake areas of the Similkameen Valley, and the White Lake basin near Oliver. There are also records from the extensive sagebrush areas of Richter Pass, a few kilometres north of Kilpoola Lake, but none in the last decade. Darcus (1932) reported birds from Oliver and Penticton, but there have been no records in the past 50 years from the latter site and only two records from Manuel's Flats east of Oliver, with no evidence of breeding. Sage Thrashers likely occasionally breed in the north Okanagan and Thompson Valleys; there is a 1925 breeding record near Vernon (Cannings *et al.* 1987) and an old nest found near Cache Creek in 1990 (Campbell *et al.* 1997). There are three records of singing birds elsewhere in the Thompson Valley and one from the Fraser Valley near Lytton (Cannings 1992, 2000). There are also almost annual reports of spring migrants at various sites in southern British Columbia in inappropriate breeding habitat. Recent (2000–2010) records of Sage Thrashers in suitable breeding habitat in British Columbia are summarized in Table 1.

Table 1. British Columbia Sage Thrasher breeding site records, 2000-2010 (from BCINTBIRD listserve archives and Environment Canada, unpubl. data).

Site	Year	Evidence
Anarchist Mtn.	2000	1 singing
Anarchist Mtn.	2007	1 singing
Armstrong Creek	2004	nest
Armstrong Creek	2005	1 singing
Chopaka	2000	1 singing
Chopaka	2002	1 singing
Chopaka	2003	1 singing
Chopaka	2005	1 singing
Chopaka	2007	1 singing
Chopaka	2008	1 singing
Chopaka	2010	1 singing
Churn Creek	2009	1 post-breeding
Haynes Lease	2003	1 singing
Kilpoola Lake	2010	1 singing
Manuel's Flat	2000	1 singing
Manuel's Flat	2005	1 singing
Marron Valley	2007	pair and juvenile
Shingle Creek	2009	1 singing
West Osoyoos	2009	1 singing
White Lake	2003	1 singing
White Lake	2004	1 pair
White Lake	2005	4 nests
White Lake	2006	3 nests
White Lake	2007	1 singing
White Lake	2008	4 nests, 10 singing
White Lake	2009	2 singing
White Lake	2010	nest

In Alberta and Saskatchewan, the species has been reported in 14 of the last 20 years (1990 to 2009, Table 2). Breeding has been confirmed at three sites in Alberta (Petrified Coulee, Manyberries and Wildhorse) and at two sites in Saskatchewan (Frenchman River near Eastend and Govenlock PFRA Pastures) (Potter 1937, Federation of Alberta Naturalists 1992, Smith 1996, Knapton 2010). There were three confirmations of breeding at two sites in the first Alberta Breeding Bird Atlas project between 1987 and 1991 (Federation of Alberta Naturalists 1992). In the second Alberta atlas project (2000-2005), breeding was only confirmed from one 10X10-km square, and sightings were less frequent than during the first atlas (Federation of Alberta Naturalists 2007). Smith (1996) states that, in Saskatchewan, the Sage Thrasher “nests erratically along the Frenchman River and Battle Creek.” Records of Sage Thrashers in suitable breeding habitat in Alberta and Saskatchewan are summarized in Table 2.

Table 2. Sage Thrasher records from Alberta and Saskatchewan adapted from Knapton 2010.

Province	Site	Year	Evidence
Alberta	Orion	1924	1 bird
	Walsh	1940	1 singing
	Drumheller	1958	1 bird
	Lodge Creek	1960s	1 bird
	Keoma area	1986	1 singing
	Milk River, e of Aden	1988	1 bird
	Petrified Coulee	1988	nest
	Petrified Coulee	1989	nest
	Manyberries	1989	nest
	Bindloss	1990	1 singing
	Petrified Coulee	1991	1 bird
	Petrified Coulee	1992	1 pair
	Medicine Hat	1997	1 bird
	Brooks	1999	1 bird
	Petrified Coulee	1999	adult carrying food
	Medicine Hat	2002	1 bird
	Manyberries	2002	3-4 birds
	Manyberries	2003	1 pair
	Ralston	2003	1 pair
	Medicine Hat	2003	1 bird
	Manyberries	2004	1 pair
	Enchant	2005	1 bird
	Rolling Hills	2006	1 bird
	Wildhorse	2006	nest
	Manyberries	2006	1 bird
	Rolling Hills	2007	1 bird
	Sage Creek	2007	2 birds
	Wildhorse	2009	2 birds
Saskatchewan	Shaunavon	1933	1 bird
	Eastend	1934	2+ nests
	Eastend	1935	1 bird
	Eastend	1937	2 pairs
	Eastend	1965	1 bird
	Otter Creek	1965	1 bird
	Matador	1969	1 bird
	Matador	1972	1 bird
	Braddock	1973	1 bird
	Battle Creek	1979	1 bird
	Govenlock	1982	adult with fledgling

Province	Site	Year	Evidence
	Rosefield	1988	1 bird
	Merryflat	1988	1 bird
	Govenlock	1989	1 bird
	Eastend	1992	1 bird
	Govenlock	1993	1 bird
	Consul	1993	1 bird
	Big Muddy Valley	1995	1 bird
	Freefight Lake	2002	1 bird
	Ravenscrag	2002	1 bird
	Govenlock PFRA	2005	1 bird
	Maple Creek	2006	1 bird
	Saskatchewan Landing PP	2009	2 birds

If one considers the three BC sites in the South Okanagan-Similkameen valleys, (Chopaka, Kilpoola, and White Lake) where breeding is regular and has been over the last 20 years, a convex polygon produces an extent of occurrence (EO) of about 500 km². It is difficult to calculate an EO for Alberta and Saskatchewan because records for the species in these areas are relatively sporadic. However, if sites in Alberta and Saskatchewan that have recorded the species in the last 20 years are included, the EO for birds on the Prairies is 4000 km². Therefore, the total EO for Sage Thrashers in Canada is 4500 km².

The index of area of occupancy (IAO) is 40 km² using a 2X2-km grid. This value is derived from three sites in the South Okanagan-Similkameen valleys, (Chopaka, Kilpoola, and White Lake) where the species breeds regularly, and assumes a single site is occupied in Alberta, in any year.

HABITAT

Habitat requirements

During the breeding season, the Sage Thrasher is almost entirely dependent on sagebrush (*Artemisia* sp.) environments (Braun *et al.* 1976). Over most of its range, the dominant sagebrush species used is Big Sagebrush (*A. tridentata*); in Saskatchewan the birds use Silver Sagebrush (*A. cana*). Breeding birds are occasionally noted in similar shrub-steppe habitats such as Greasewood (*Sarcobatus vermiculatus*) and Antelope-brush (*Purshia tridentata*) (Smith *et al.* 1997, Reynolds *et al.* 1999).

In general, numbers of territorial birds are positively correlated with sagebrush cover and negatively correlated with annual grasses such as bluegrasses (*Poa* spp.) and Cheatgrass (*Bromus tectorum*) (Wiens and Rotenberry 1981, Dobler *et al.* 1996, Reynolds *et al.* 1999). In central Washington, Sage Thrashers are associated with good or fair quality rangeland, and are generally absent from poor quality, heavily overgrazed areas; where adequate shrub cover exists, their numbers are positively correlated with perennial grasses, especially Bluebunch Wheatgrass (*Pseudoroegneria spicatus*) (Stepniwski 1999).

Sage Thrashers are associated with sites that have medium-sized sagebrush (30-60 cm high), with some larger sagebrush (> 1 m high) for nesting (Wiens and Rotenberry 1981, Reynolds *et al.* 1999), and sites with good sagebrush cover, large patch size, decreased disturbance and similarity of habitat within a minimum 1-km radius (Knick and Rotenberry 1995). Sagebrush cover measured at nest sites ranged from 11 to 44% (Rich 1980). Occupied sites were characterized by loamy and shallow soils rather than sandy soils (Reynolds *et al.* 1999).

Shrubs used by Sage Thrashers for nesting in British Columbia average $132 \text{ cm} \pm 32(\text{sd})$ in height and $168 \pm 57(\text{sd})$ in width (R. Millikin pers. comm.). In Alberta and Saskatchewan, sagebrush attains this size only on alluvial soils along creeks and rivers, in coulees (Wayne Smith, Robert Gardner, and Chel Macdonald, pers. comm.) and human-made drainages where there is no grazing (H. Trefry pers. comm.). This may be a factor limiting the distribution of the species on the Prairies.

In late summer and fall, Sage Thrashers often forage in fruit and berry farmlands adjacent to sagebrush habitats (Bent 1948); wintering birds use a variety of arid scrub, brush, and thicket habitats (Howell and Webb 1995).

Habitat trends

The area of suitable habitat available in British Columbia has declined by approximately 33% since 1800 (Figure 6, Lea 2008). Recent declines have been slower, but continue. Vineyard developments have converted several hundred hectares of apparently suitable habitat in the south Okanagan and lower Similkameen valleys in the past decade, though none involved areas where thrashers were known to nest in recent years (R.J. Cannings pers. obs.). Most of the private land (ca. 50 ha) on the Richter Pass site is now in 2-ha lots on which the habitat is degraded to various degrees.

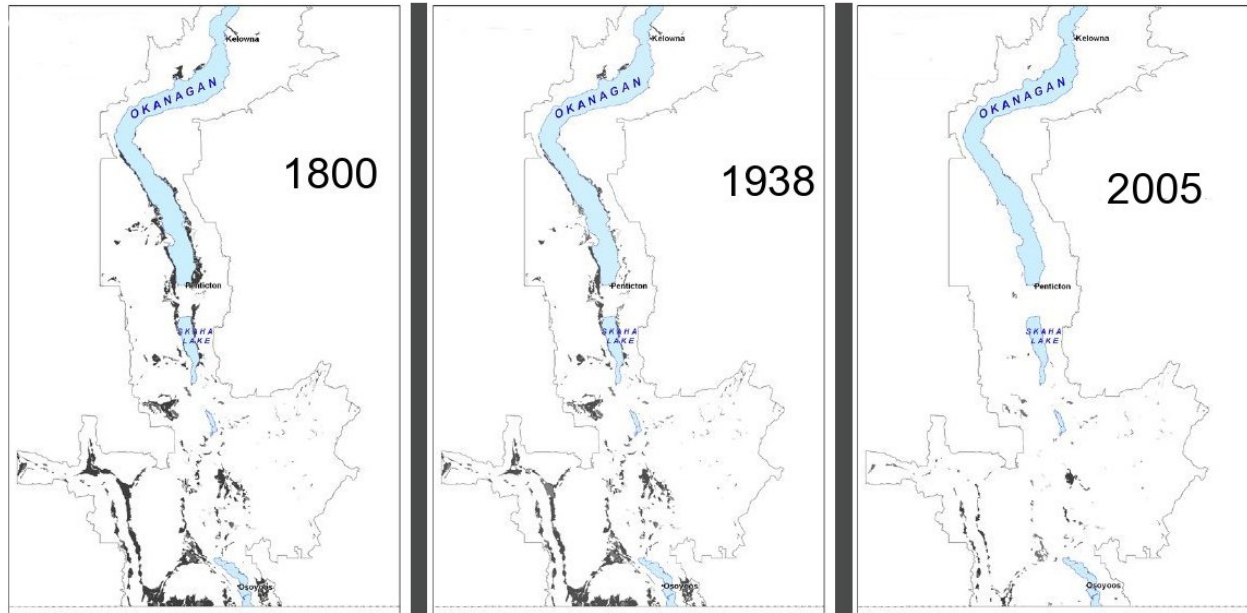


Figure 6. Sagebrush shrub steppe extent in south Okanagan and lower Similkameen valleys in 1800, 1938, and 2005 (from Lea 2008).

In British Columbia, the Ministry of Environment, Lands and Parks (1998) created a habitat suitability model based on Terrestrial Ecosystem Mapping. This model identified 27,478 ha of habitat in the south Okanagan and Similkameen Valleys as potentially suitable for Sage Thrasher breeding and/or foraging, though not necessarily occupied by thrashers (Figure 7). Indeed, very little of this area is actually occupied and may well be unsuitable for breeding. Also, this total is based on analysis of air photos taken in 1987, and does not take into account recent habitat losses mentioned above.

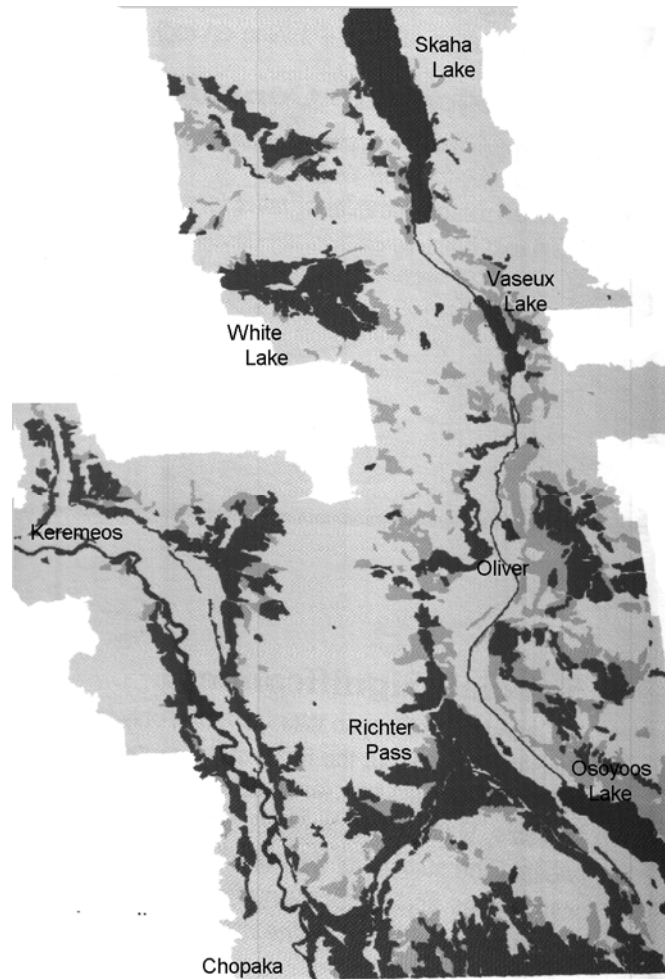


Figure 7. Habitat suitability map (moderate to high quality habitat) for Sage Thrasher in the south Okanagan Valley (from Ministry of Environment, Lands and Parks 1998). Blackish areas are possible breeding habitat (sagebrush steppe); pale grey areas are other steppe habitats that could be used for foraging.

In Alberta and Saskatchewan, habitat loss is unquantified, but losses calculated for habitats occupied by Greater Sage-Grouse have been, and these habitats are similar to those used by Sage Thrashers (i.e. Silver Sagebrush-dominated mixed grassland). In Saskatchewan, 69% of potential habitat for Greater Sage-Grouse has been lost to cultivation (McAdam 2003), with most of the loss occurring before 1981 (Thorpe *et al.* 2005). In Alberta, 46% of potential habitat has been lost (Nernberg and Ingstrup 2005). In Alberta and Saskatchewan, limiting factors are likely soil moisture, overgrazing and fire (G. Holroyd and H. Trefry pers. comm.).

There are serious concerns about loss of habitat in the United States, where almost all loss is due to intensive agriculture. Of particular concern to Canadian populations is the fact that about half of the suitable habitat has been lost in Washington and most of the remaining habitat is fragmented (Reynolds *et al.* 1999).

Populations in the United States have been drastically affected by techniques employed to improve the quality of range for cattle. Sagebrush reduction is a common target of these programs and includes planting Crested Wheatgrass (*Agropyron cristatum*) (Reynolds and Trost 1980), fire and herbicides. Burned areas still lack thrashers nine years after the fire, and populations remain suppressed on sites treated with herbicides 22 years earlier (Kerley and Anderson 1995). Removal of only the largest sagebrushes eliminates Sage Thrashers from an area because of their nesting requirements. Accidental or lightning-caused fires are also a concern, especially in British Columbia where habitat fragments are both few and small.

The spread of invasive, exotic Cheatgrass has had a negative effect on Sage Thrasher populations through its influence on fire regimes in western grasslands (Knick and Rotenberry 1997). Cheatgrass, an annual species, tends to occur in large monocultures that are highly flammable, increasing the spread of fire and loss of sagebrush and other shrubs, and through a feedback mechanism, accelerating the spread of annuals (such as Cheatgrass). This cycle has led to a continued increase in Cheatgrass in the United States (Knick and Rotenberry 1997); in Canada its abundance and range seem to be stable and at high levels.

These fires and large-scale agricultural developments have destroyed and fragmented large areas of Sage Thrasher habitat throughout its range (Knick and Rotenberry 2000), reducing the potential for population flow to the periphery of its range in southern Canada. On a positive note, Sage Thrashers seem to tolerate habitat fragmentation better than other sagebrush obligates (e.g. Sage Sparrow, *Amphispiza belli*, and Brewer's Sparrow), but prefer homogenous habitats with relatively high sagebrush cover (Knick and Rotenberry 1995). In southeastern Idaho, Sage Thrashers were almost twice as abundant on plots in fragmented habitats (habitat patches 35 to 200 ha) than in plots in unfragmented habitat (Belthoff and Rideout 1999).

Several climate change models suggest that climate suitable for sagebrush growth and survival could shift northward over the next century (Shafer *et al.* 2001). This would result in suitable Sage Thrasher habitat being largely confined to Canada instead of the United States as is presently the case (Figure 8).

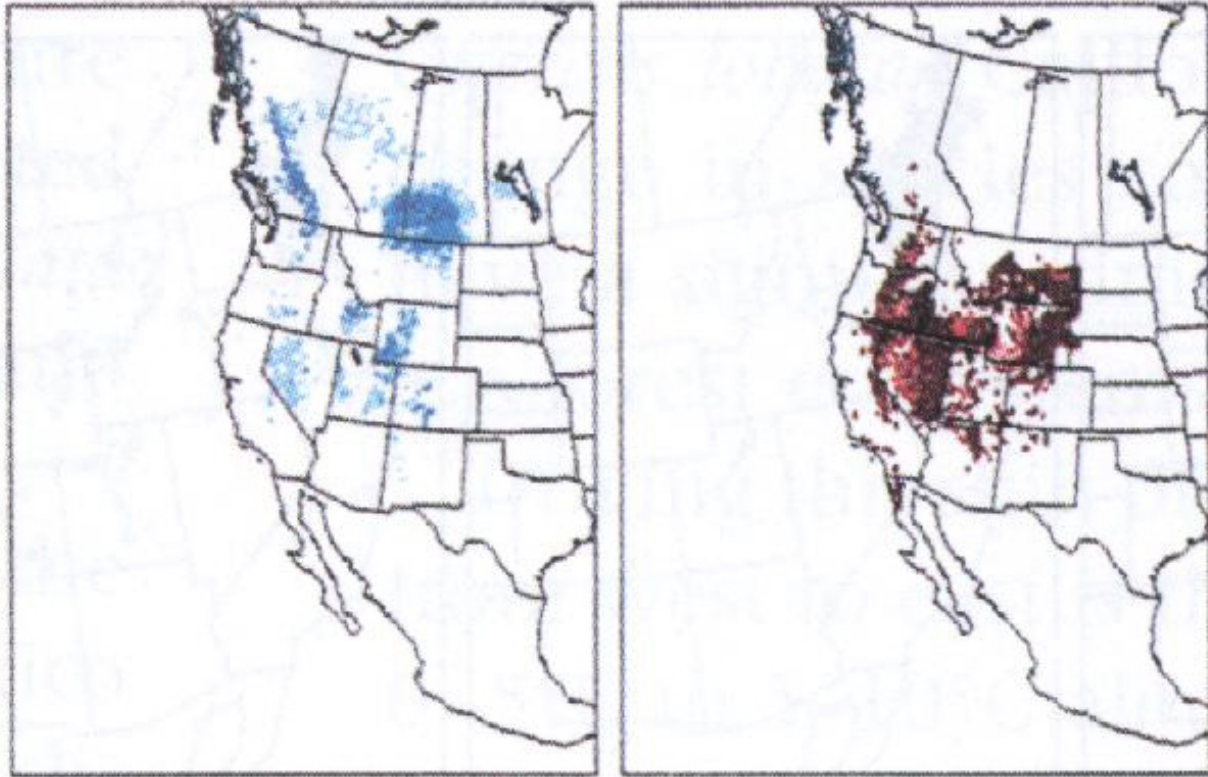


Figure 8. Projected distribution of sagebrush at the end of the 21st Century: left, projected presence; right, projected absence; black indicates areas where it is present now but not projected to occur at the end of the century (Shafer *et al.* 2001).

Habitat protection/ownership

Of the habitat identified as potentially suitable for Sage Thrasher breeding and/or foraging in the south Okanagan and Similkameen Valleys in 1987, 42% is private land, 28% Indian Reserve, 22% provincial Crown land and 8% conservation land (protected areas) (updated from original estimates in Ministry of Environment, Lands and Parks 1999). In terms of known Sage Thrasher sites, the three sites in the extreme south Okanagan and Similkameen valleys, the Chopaka border crossing, Kilpoola Lake and Richter Pass, are a mix of privately owned and provincial Crown land. Most of the Crown land at these sites is now part of the South Okanagan Grasslands Protected Area (1153 ha, less than half of which would be suitable for thrashers). Sage Thrasher habitat at White Lake is federal land under the authority of the National Research Council, and the Nature Trust of British Columbia has 67- to 70-year exclusive-use leases (for grazing or research) over the entire basin (1084 ha, about 600 ha of which is suitable for thrashers), so the habitat is considered secure.

Grasslands National Park in southwestern Saskatchewan could provide habitat, but currently much of it is invaded by Crested Wheatgrass or there is not sufficient grazing pressure to provide the open ground habitat that the birds prefer for foraging (H. Trefry pers. comm.). One site in Saskatchewan where a Sage Thrasher was photographed is provincial Crown land listed under the *Wildlife Habitat Protection Act*. As such, it is at least protected from sod-breaking without permit (J. Pepper, pers. comm.). In Alberta most sagebrush is on provincial rangelands. However, some tracts of sagebrush occur in the valley bottom of the Milk River Natural Area and in the Heritage Rangelands along Sage Creek and in Onefour Agricultural Sub-station (G. Holroyd and H. Trefry pers. comm.).

BIOLOGY

Sage Thrashers are typical of most other songbirds in that the male establishes a breeding territory and advertises it with song early in the breeding season. They form monogamous pairs, and both sexes build the nest, incubate the eggs and care for the young.

Sage Thrashers are insectivores in spring and early summer, foraging on the ground for ants, ground beetles, grasshoppers, crickets and true bugs (Stephens 1985, Reynolds *et al.* 1999). In late summer, family groups move into thickets along draws to feed on berries and caterpillars (Stepniowski 1999).

Life cycle and reproduction

Sage Thrashers place their nests in shrubs, usually sagebrush. In British Columbia, nests range from 8 to 154 cm (mean 36 cm) above the ground and average 27.3 cm from exterior edge of sagebrush and 37.7 cm from main stem (R. Millikin, pers. comm.). These data are similar to those reported from a study in Idaho (Belthoff and Rideout 1999). The most important factor in nest placement seems to be the amount of cover above the nest; nests are placed just below the densest vegetation in the vertical profile (Rich 1980, Castrale 1982), almost invariably about 50 cm below the top of the plant (Petersen and Best 1991). This cover over nests is critically important for protection from predation; in 15 nests where cover was removed, all were depredated within 24 hours (Reynolds *et al.* 1999).

The clutch sizes of 15 nests at White Lake, British Columbia ranged from three to five eggs, with a mean of 4.1 (BCNRS, Environment Canada, unpub. data). Two nests from Saskatchewan held five eggs and five newly hatched young respectively (Potter 1937). While a nest found in Alberta in 2006 held five eggs and fledged two young (G. Holroyd and H. Trefry, pers. comm.).

Sage Thrashers can raise two broods per season in the central part of their breeding range (e.g. southern Idaho, Reynolds 1981), but there is no evidence of this occurring in Canada (Cannings 1992, 2000). Nest starts in British Columbia range from late May to late June and hatching dates range from mid-June to mid-July (Cannings *et al.* 1987). The few nesting dates available from Alberta and Saskatchewan indicate a pattern similar to that found in British Columbia (Alberta: young in nest on 16 July 1988 and in June 1989 (Baresco 1989); Saskatchewan: calculated clutch initiations on 1 and 12 June (Potter 1937); fledglings on 8 July (Gollop 1982)).

There is little information on nesting success in British Columbia; broods of three to five young have been reported (BCNRS). Alberta's 1988 nest was apparently successful in that at least one young fledged. Reynolds and Rich (1978) report a 46% overall nesting success (young fledged per egg laid, n=32 nests) in Idaho. Given an average clutch size of four eggs, therefore, a pair could normally be expected to fledge two young each summer.

Breeding territory size is about 1 ha in the core of the species' range: in Idaho 0.96 ha (0.64-1.64, n=7; Reynolds and Rich 1978); in Washington 0.5-1.7 ha (n=7, Gooding 1970). Estimates of territory size in BC range from 6 to 8 ha (R. Millikin, cited in Campbell *et al.* 1997).

Generation time is unknown for this species, but likely around three years, which is typical for most passerines.

Physiology and adaptability

Sage Thrashers have a rather narrow habitat requirement, especially during the breeding season, when they are essentially tied to sagebrush grasslands. They also require at least some large sagebrush in their territories for nesting.

Dispersal and migration

Sage Thrashers are highly migratory, leaving British Columbia in late August and September (Cannings *et al.* 1987). In some years, birds return as early as April or early May, the earliest record being 4 April (Cannings *et al.* 1987). The bulk of the breeding population, however, may not arrive before the end of May—only 23 of 130 British Columbia records are from earlier than 1 June.

The Prairie population has a similar phenology (Knapton 2010). The earliest and latest dates for Alberta and Saskatchewan are 24 April and 30 August; most sightings are from the fourth week of May through the second week of July. Breeding dates range from late June through late July.

Interspecific interactions

There is no information on predation on adult Sage Thrashers, although Loggerhead Shrikes (*Lanius ludovicianus*) are known to take nestlings (Reynolds 1979). Corvids such as Black-billed Magpie (*Pica hudsonia*) and Common Raven (*Corvus corax*) and chipmunks (*Tamias* spp.) have depredated artificial nests set out in sagebrush landscapes (Vander Haegen *et al.* 2002).

Brown-headed Cowbird (*Molothrus ater*) parasitism should have relatively little effect on Sage Thrasher breeding success because thrashers reject cowbird eggs (Sullivan 1988). Cowbirds will, however, remove eggs before laying, so there could be some costs, despite egg rejection.

POPULATION SIZES AND TRENDS

Search effort

General surveys

The Sage Thrasher is a rare bird in Canada and is thus subject to considerable search effort from the country's birders. This effort is unquantified but would be a minimum of 100 hours per year based on an estimate of 50 birders spending a minimum of two hours searching. Much of that effort would be targeted in areas where Sage Thrashers have been seen previously (especially White Lake and Chopaka Customs in BC), so possible new sites may not receive the same search effort.

Researchers from Environment Canada conducted transect searches for Sage Thrashers in the south Okanagan-Similkameen in 1991, 1993 and 1994. These were one-hour, one-kilometre transects through suitable habitat at Chopaka, Kilpoola Lake, White Lake and East Similkameen. Searches, using somewhat different techniques, were conducted at different sites in the same region in 1998. Other research teams studying sagebrush sparrows in similar areas from 1999 to the present were trained and directed to report thrashers when seen. This would add about 400 hours of search effort per year. Essentially all of the suitable habitat within the species' range in British Columbia has been searched for Sage Thrashers, although the intensity of search would vary from site to site and year to year.

Scott (2009) studied the distribution and habitat use of Sage Thrashers in the White Lake Basin. This involved transects throughout the basin, with point counts at 47 sites.

There have been few directed searches for Sage Thrashers in Saskatchewan and Alberta. In 2003, all historical sites for Sage Thrashers in both provinces were checked (Smith 2005). No birds were located, but it was noted that the unusually wet conditions rendered many of the areas unsuitable for breeding. Researchers from Environment Canada have surveyed historical sites and suitable sagebrush habitat in southeast Alberta, including three days in June 2009 by canoe along the Milk River. They located one pair that did not appear to nest.

Breeding Bird Surveys (BBS)

The BBS is a volunteer-based program that surveys North American breeding bird populations (Sauer *et al.* 2008). Breeding bird abundance data are collected at 50, 400-m radius stops spaced at 0.8 km intervals along permanent 39.2 km routes. Surveys start one half hour before sunrise and last 4.5 hours. There are no BBS trend data for the species in Canada because of its rarity. Trend information does, however, exist for the Columbia Plateau, a BBS physiographic area that includes parts of Idaho, Nevada and eastern parts of Oregon and Washington. The population of birds that occurs in parts of this area is likely a source of birds for the BC population and so trend information from the Columbia Plateau may be relevant to the state of the BC population and the potential for rescue.

Abundance

Counts at White Lake, BC in the past 40 years, based on searches by birders and biologists outlined above, have ranged from 0 to 19 birds, with up to five nests (1969) and four nests (2008) found (Cannings *et al.* 1987, Campbell *et al.* 1997, Scott 2009). Since 1981, Sage Thrashers have been reported regularly from Chopaka Customs, where up to 10 pairs nest annually. Preston (1990) searched the Chopaka, Richter Pass, Kilpoola Lake, and White Lake sites for six days in 1990 and found only three singing males and a fourth silent bird, all at Chopaka Customs. While surveying Brewer's Sparrows in sagebrush habitat throughout the south Okanagan in 1991, Dwight Harvey (pers. comm.) counted 11 Sage Thrashers singing: one at White Lake, four south of Kilpoola Lake, and six at Chopaka Customs.

At its historical maximum, the British Columbia spring population of Sage Thrashers may have been as high as 30 or more pairs (Darcus 1932, Cannings 1992, 2000), but recently maximum numbers have been in the range of five to 12 pairs and the minimum number about three pairs (Cannings 1992, R. J. Cannings, unpub. data). Darcus (1932) mentions breeding sites at Oliver and Penticton; there is no suitable habitat remaining near Penticton, while at Oliver only one possible site remains—Manuel's Flat. The latter site has had two sightings of singing males in the past few decades, in 1992 and 2000, but it is not known how regular the species was at this site in the first half of the 1900s. Lea's (2008) mapping shows historically the habitat at both these sites was much more extensive.

The Alberta-Saskatchewan population occurs at a very low density so surveying is difficult, but annual numbers likely range from one to 12 birds (H. Trefry pers. comm.). Sage Thrashers were seen on the Prairies in 14 of the 20 years between 1990 and 2009 (Knapton 2010), the maximum number seen in any one year was the four pairs present in Saskatchewan in 1934 (Potter 1937).

The minimum number of breeding birds in Canada is thus about seven (six in BC, one in AB and SK) and the maximum about 36 (24 in BC, 12 in AB and SK).

Fluctuations and trends

At the continental scale, populations are stable where suitable habitat remains, but “its numbers have been dramatically reduced, and in some cases, local populations eliminated, where there has been wholesale conversion of sagebrush rangeland” (Reynolds *et al.* 1999). Long-term BBS data for the Columbia Plateau show a significant decline of 1.49% per year ($P=0.01$, $n=60$ routes) between 1966 and 2007 (Sauer *et al.* 2008), which corresponds to a population loss of 46% over the last 41 years. In the most recent 10-year period (1997 to 2007), BBS data from this area show a significant decline of 3.99% per year ($P=0.00$, $n=40$ routes) (Sauer *et al.* 2008) or a population loss of 33% over the last 10 years or approximately three generations.

As with many species at the edge of their range, Sage Thrasher numbers in Canada fluctuate from year to year, with some sites being only occasionally occupied. Sage Thrasher populations also fluctuate considerably towards the centre of the range, perhaps due to local climatic variability (Reynolds 1981).

Rescue effect

Sage Thrasher populations in the United States could conceivably augment Canadian breeding populations; indeed this likely happens almost annually. Populations in adjacent parts of the US are, however, declining (see above) and habitat has been lost in the United States (Knick *et al.* 2003), suggesting that rescue may be limited.

In addition, the Canadian breeding range of Sage Thrashers is isolated from the core of the species' range, again limiting the possibility of rescue. The British Columbia population is connected by a very narrow corridor of habitat to the Columbia Basin in Washington, which in turn is somewhat isolated from the heart of the species' range in the Great Basin. Birds nesting in Alberta and Saskatchewan are at the northern end of a region of very low Sage Thrasher density in Montana and are thus somewhat isolated from denser populations in central Wyoming (Figures 2 and 3).

LIMITING FACTORS AND THREATS

Because of the Sage Thrasher's dependence on the sagebrush ecosystem, almost all of the factors limiting its populations concern the loss, alteration, or degradation of this environment. The rapid expansion of vineyards in the South Okanagan, housing developments in the Richter Pass area (Preston 1990), and sagebrush removal for improving range, are the greatest threats to sagebrush habitats in British Columbia (Millikin and Gebauer 2002).

Based on the habitat loss calculated for the Greater Sage-Grouse, 69% of potential habitat has been lost in Saskatchewan (McAdam 2003) and 46% in Alberta (Nernberg and Ingstrup 2005). In British Columbia, historic habitat loss has also been extensive; Lea's (2008) historic mapping shows that, by 2005, 33% of the Big Sagebrush-dominated communities found in the south Okanagan had disappeared, with hobby farms fragmenting the Richter Pass area and vineyards around Osoyoos eliminating other sites with fair habitat. Also, a tract of provincial Crown land on the west side of Osoyoos that has fair Sage Thrasher habitat (and at least one recent Sage Thrasher sighting) is the subject of long-term housing development plans. That said, all three sites where Sage Thrashers are regularly found in British Columbia have some level of habitat protection: the White Lake basin is federal land and is therefore presumably protected under the *Species at Risk Act*, half of the Chopaka site is in a provincial Protected Area, and the Kilpoola Lake location is a mix of unprotected ranchland, provincial Protected Area and property owned by the Nature Trust of BC.

Fire is also a real threat to Sage Thrasher habitat because it destroys Big Sagebrush, although Silver Sagebrush apparently re-sprouts quickly after fires (Wambolt *et al.* 1989). Sage Thrashers did not use shrub-steppe sites burned nine years earlier (Kerley and Anderson 1995). A single fire can often trigger a cycle of larger and more intensive fires that promote the conversion of the ecosystem to one dominated by annual grasses (Knick and Rotenberry 1997). A fire was purposely set in the White Lake basin in 1986 ostensibly to improve the range quality; that quadrant of the basin is still dominated by grasslands unsuitable for Sage Thrashers. A large area of sagebrush in the Kilpoola Lake area burned by wildfires in 1994 remains unsuitable for thrashers, and a 40-ha blaze in the Richter Pass area in July 2010 caused similar damage on a smaller scale.

Loss of sagebrush habitat to agriculture, strip mining and residential developments has caused great concern for birds dependent on that environment in the United States (Braun *et al.* 1976). Approximately half of the historic area of sagebrush steppe in the United States has been lost to intensive agriculture, and only half of the remaining portion is in good grazing condition with native understory remaining (West 1996). Heavy grazing pressure may affect Sage Thrasher populations, but thrashers are generally less sensitive to grazing pressure than other grassland bird species (Reynolds and Trost 1981; Kantrud and Kologiski 1982). Cattle do impact nest site habitat by breaking shrubs and thus reducing foliage density. Huge areas of sagebrush in Washington State have been converted to wheatfields in the past century, especially since the construction of the Grand Coulee Dam (Weber 1980).

Herbicides have also been used to improve range quality in the past; Kerley and Anderson (1995) found that Sage Thrashers were less abundant on sites with substantially reduced sagebrush cover due to herbicide treatments 22 years earlier. There are few data concerning the effects of pesticides on Sage Thrashers. Aerial application of Malathion (585 gm/ha) in Idaho reduced the insect population available to breeding thrashers, but there were no significant effects on nestling survival (Howe *et al.* 1996).

PROTECTION, STATUS AND RANKS

COSEWIC assessed the Sage Thrasher as Endangered in November 2000; it is currently listed as Endangered under Schedule 1 of the federal *Species at Risk Act*. The Sage Thrasher and its nests and eggs are protected in Canada and the United States from hunting and collecting under the *Migratory Birds Convention Act* (1994). It is also protected in British Columbia, Alberta and Saskatchewan under their respective provincial wildlife acts. The impact of these measures is likely negligible because this species is rarely intentionally killed or harassed.

The Sage Thrasher is on the BC Conservation Data Centre's Red List of potentially threatened or endangered species, and is included in the Category of Species at Risk under the Identified Wildlife Management Strategy of the provincial *Forest and Range Practices Act* (2004). The Sage Thrasher is ranked globally as G5. In Saskatchewan and British Columbia it is S1B (critically imperiled). It is ranked in Alberta as Status Undetermined (S?). Adjacent states have ranked it as follows: Washington S3; Idaho S5, and Montana S3 (NatureServe 2009).

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BIOGRAPHICAL SUMMARY OF REPORT WRITER

Richard (Dick) Cannings was born and raised in the Okanagan Valley in a family keenly interested in natural history. This early involvement in birds, bugs and plants led him to a university education in zoology, including a BSc degree from the University of British Columbia and a MSc from Memorial University of Newfoundland. He worked for 15 years as the Curator of the Cowan Vertebrate Museum in the Department of Zoology at the University of British Columbia. He left UBC in 1995 to return to his Okanagan roots.

Dick now works half-time for Bird Studies Canada, coordinating Canadian Christmas Bird Counts, the eBird program and the British Columbia-Yukon Owl Survey. His consulting work is primarily centred on endangered species, particularly those in southern British Columbia. He was co-chair for birds on the Committee on the Status of Endangered Wildlife in Canada for eight years and has served on both the BC Environmental Appeal Board and the BC Forest Appeals Commission. He has written a number of books, including *The Birds of the Okanagan Valley, British Columbia* with brothers Sydney and Robert Cannings; *British Columbia: A Natural History* with Sydney Cannings, *The BC Roadside Naturalist*, *The Rockies: a Natural History*, and *An Enchantment of Birds*.

COLLECTIONS EXAMINED

No collections were examined.