

Species Status Assessment

Class: Birds
Family: Phasianidae
Scientific Name: *Falciennis canadensis*
Common Name: Spruce Grouse

Species synopsis:

The spruce grouse is a member of the order Galliformes and is included in the genus *Falciennis*. The spruce grouse is distributed in a transcontinental band across North America that generally conforms to the extent of the boreal forest biome (Aldrich 1963). In New York it occurs in isolated patches of lowland coniferous forests dominated by spruce, tamarack, and balsam fir. The species is restricted to 15 small isolated subpopulations located exclusively within the northwestern and northcentral section of the Adirondack Park in St. Lawrence and Franklin counties. Spruce grouse subpopulations in New York are small and declining. By 2006, only 14 of 32 sites occupied from 1976-1987 (Fritz 1977, Bouta 1991) and one new site were occupied (Ross and Johnson 2008) and there were probably fewer than 75 – 100 adults in the state (Ross and Johnson, unpublished data).

I. Status

a. Current Legal Protected Status

- i. **Federal** Not Listed **Candidate?** No
- ii. **New York** Endangered; SGCN

b. Natural Heritage Program Rank

- i. **Global** G5
- ii. **New York** S2 **Tracked by NYNHP?** Yes

Other Rank:

The spruce grouse is listed as endangered in New York and Vermont, threatened in Wisconsin, a species of special concern in Michigan, a species of conservation concern in New Hampshire, and hunting is closed in Maine (designated as SGCN), Oregon (designated as "State Sensitive") and Nova Scotia ("Protected"). Partners in Flight lists spruce grouse as a Stewardship Species and a Species of Continental Importance.

Status Discussion:

The spruce grouse is common throughout most of its continental range. It is regarded as a G5 or globally secure species throughout the main portion of its range in northern Canada (NatureServe 2013). However, because of low local population densities, hunting is restricted or banned in some states and provinces.

In New York, spruce grouse is a very rare, local and uncommon resident and breeder in the Adirondack Mountains. It is restricted exclusively to lowland boreal habitat in the northwestern section of the Adirondack Region.

I. Abundance and Distribution Trends

a. North America

i. Abundance

declining increasing stable unknown

ii. Distribution:

declining increasing stable unknown

Time frame considered: 1980-2010

b. Regional

i. Abundance

declining increasing stable unknown

ii. Distribution:

declining increasing stable unknown

Regional Unit Considered: Adirondack Mountains

Time frame considered: 1976 to present

c. Adjacent States and Provinces

CONNECTICUT	Not Present <u> X </u>	No data _____
MASSACHUSETTS	Not Present <u> X </u>	No data _____
NEW JERSEY	Not Present <u> X </u>	No data _____
PENNSYLVANIA	Not Present <u> X </u>	No data _____
ONTARIO	Not Present _____	No data _____

i. Abundance

____ declining ____ increasing X stable ____ unknown

ii. Distribution:

____ declining ____ increasing X stable ____ unknown

Time frame considered: 1981-85 to 2001-05

Listing Status: Not Listed

QUEBEC	Not Present _____	No data _____
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i. Abundance

____ declining ____ increasing X stable ____ unknown

ii. Distribution:

____ declining ____ increasing X stable ____ unknown

Time frame considered: 1984-89 to 2012

Listing Status: Not Listed

Trends Discussion:

New York is at the southeastern edge of the range and represents a disjunct population. Over the past 20 years, the Adirondack spruce grouse population has experienced a greater than 50% reduction in geographic range. In 1987, there were an estimated 175 – 315 spruce grouse present in the state; this number was likely closer to 175 individuals (Bouta 1991). In 1999, the species was added to the NYS Endangered Species List. By 2006, only 14 of 32 sites occupied from 1976-1987 (Fritz 1977, Bouta 1991) and one new site were occupied (Ross and Johnson 2008) and there were probably less than 75 – 100 adult spruce grouse in the state (Ross and Johnson, unpublished data).

Population viability analysis (PVA) modeling (A. Ross, unpublished data) indicates that lack of action will likely lead to the species' extirpation in New York, since forests in areas occupied by spruce grouse are aging to the point where they may no longer provide the necessary requirements for the species. The PVA indicated that the probability of extinction was 84.8% over 100 years and the average time to first extinction was 23.06 years (SE = 0.93 years) using Adirondack population data (A. Ross, unpublished data). Absolute results of PVA, such as time to extinction, should be used cautiously, as models are only as good as the quality of the data being input. The real value of a PVA exercise is to conduct sensitivity analyses to learn where to direct conservation efforts. PVA Sensitivity Analyses results conducted by A. Ross (unpublished data) indicated that the population is sensitive to changes in mortality and the number of sites occupied by the species, both of which can be altered by improving habitat conditions at selected sites and conducting a reintroduction program.

The Wildlife Conservation Society conducted point counts for 12 boreal species at 80 sites in the Adirondack Park from 2007-2009 (Glennon 2010). Fewer than five detections were obtained for spruce grouse, which prevented occupancy modeling.

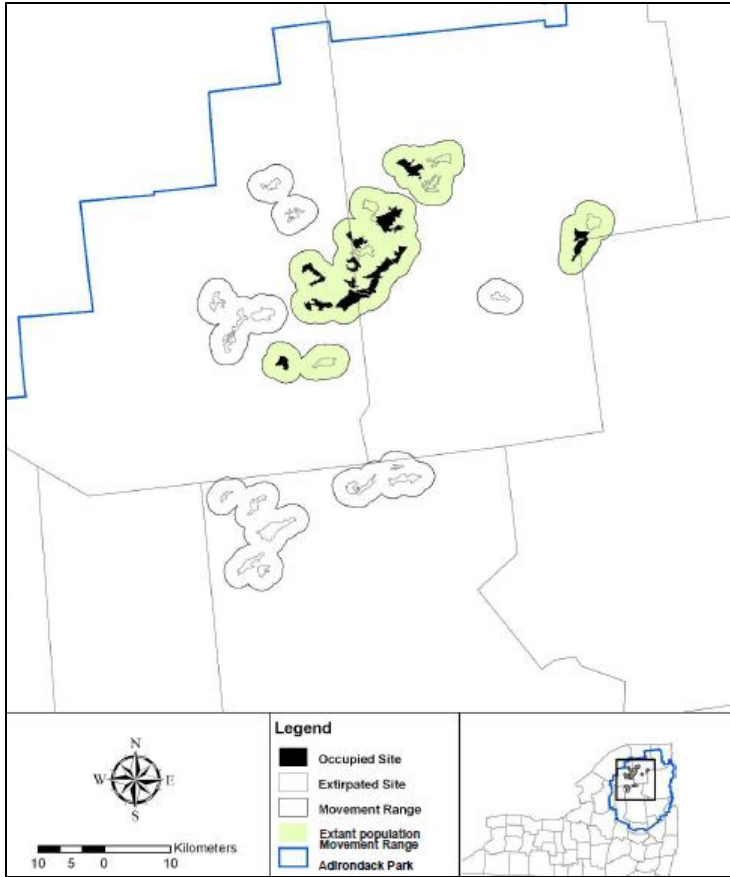


Figure 1 (Ross and Johnson 2012): Occupied and extirpated spruce grouse subpopulations in New York showing the maximum dispersal distance (2km) recorded in 2002-2006 by Ross and Johnson (2008). Sites with extirpated subpopulations depicted are those that were occupied between 1976 and 1987 (Fritz 1977, Bouta 1991). The 2km buffer may represent the area where birds may move freely within and between sites.

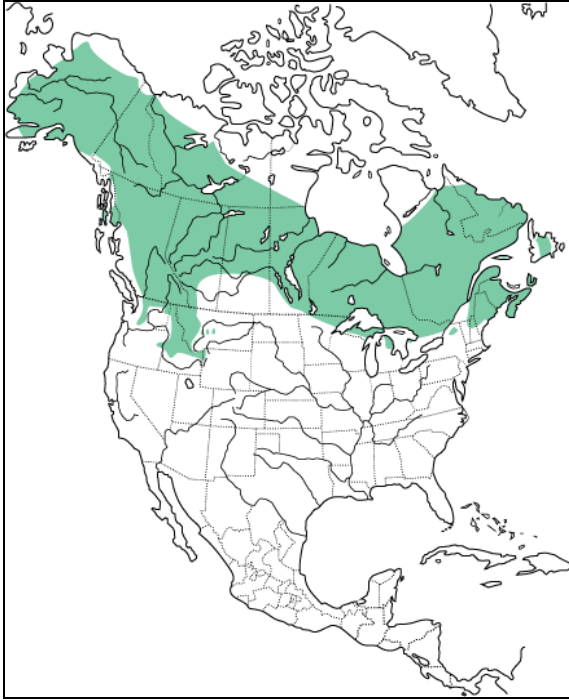


Figure 2: Distribution of spruce grouse in North America (Birds of North America Online)

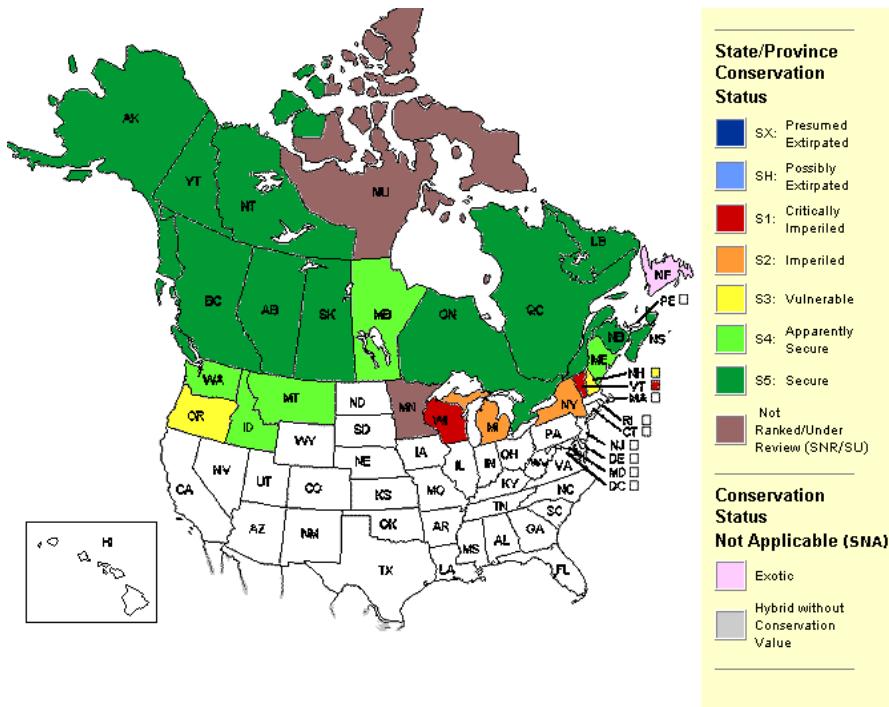


Figure 3: Conservation status of spruce grouse in North America (NatureServe 2013).

II. New York Rarity, if known:

Historic	<u># of Animals</u>	<u># of Locations</u>	<u>% of State</u>
prior to 1970	_____	_____	_____
prior to 1980	_____	_____	_____
prior to 1990	<u>175-315</u>	<u>32</u>	_____

Details of historic occurrence:

In 1987, there were an estimated 175 – 315 spruce grouse present in the state; this number was likely closer to 175 individuals (Bouta 1991).

Current	<u># of Animals</u>	<u># of Locations</u>	<u>% of State</u>
	<u>75-100</u>	<u>15</u>	_____

Details of current occurrence:

In 2010, there were 15 local populations in New York of the 32 sites occupied from 1976-1987 (Fritz 1977, Bouta 1991) and one newly occupied site (Ross and Johnson 2008), and there were probably fewer than 75 – 100 adult spruce grouse in the state (Ross and Johnson, unpublished data). Eleven subpopulations are located on private lands and four are located on state-owned lands that are part of the Adirondack Forest Preserve in the Raquette Boreal, Saranac Lakes, and Debar Mountain state land management units. The populations in Quebec and Ontario are each about 250 miles away.

New York’s Contribution to Species North American Range:

% of NA Range in New York	Classification of New York Range
<input checked="" type="checkbox"/> 0-5%	<input type="checkbox"/> Core
<input type="checkbox"/> 6-10%	<input checked="" type="checkbox"/> Peripheral
<input type="checkbox"/> 11-25%	<input type="checkbox"/> Disjunct
<input type="checkbox"/> 26-50%	Distance to core population:
<input type="checkbox"/> >50%	<u>~260 mi</u>

III. Primary Habitat or Community Type:

1. Boreal Forested Peatlands
2. Mountain Spruce-Fir Forests

Habitat or Community Type Trend in New York:

Declining Stable Increasing Unknown

Time frame of decline/increase: Since early 1900s

Habitat Specialist? Yes No

Indicator Species? Yes No

Habitat Discussion:

In New York the species is restricted to isolated populations within lowland coniferous forests. These isolated populations occur at fringes of bogs and water courses, and tend to be associated with peatlands. A common theme to all spruce grouse habitat is the presence of an understory of ericaceous vegetation and low hanging branches (Soule 1992). There is evidence that spruce grouse show some changes in habitat use seasonally (Keppie 1977, Allan 1985) where denser conifer stands are used more often in winter. These shifts may reflect dietary shifts. In New York, the spruce grouse inhabits coniferous forests dominated by black spruce and tamarack with lesser components of balsam fir and white pine, although historically the species also inhabited areas dominated by red spruce in upland habitats.

IV. New York Species Demographics and Life History

- Breeder in New York
 - Summer Resident
 - Winter Resident
 - Anadromous
- Non-breeder in New York
 - Summer Resident
 - Winter Resident
 - Catadromous
- Migratory only
- Unknown

Species Demographics and Life History Discussion:

The spruce grouse has a polygynous reproductive system and mating begins in early to mid-April and continues through the end of May. Spruce grouse breed during their first year of life with varying success. Chick growth has been shown to be negatively affected by the spruce budworm pesticide *Bacillus thuringiensis kurstaki*, primarily due to loss of caterpillar larvae in their diets (Norton et al. 2001).

Sex ratios have generally been reported (5 studies) as 1:1 (summarized in Boag and Schroeder 1992). In New York, 100% of females attempted to nest with 80% success (Ross and Johnson, unpublished data). Mean annual adult survival in the Adirondacks was observed to be 55% ($\pm 23\%$) over the period 2002 - 2006 (A. Ross, unpublished data). Robinson (1980) reported the oldest male at 7.5 years and the oldest female at 5.5 years among 315 banded birds in Michigan. The spruce grouse has a diversity of predators that, in sum, may have significant impacts on both productivity and mortality.

V. Threats:

In New York, the loss and fragmentation of habitat by selective logging of softwoods in the late 1800s and early 1900s has been noted as a major factor in the species' historical decline, as these practices usually led to an increase in the more prolific hardwood species (Bouta and Chambers 1990, Jenkins 2004). Spruce budworm outbreaks have led to the further loss of conifer habitat (Fox 1895, Fox 1902). Erecting dams to facilitate floating softwoods downstream to be milled exacerbated the problem by flooding large tracts of lowland coniferous habitat (e.g. Lows Lake and Stillwater Reservoir), thus increasing fragmentation and the loss of habitat. Changes in species composition and structure of these even-aged coniferous stands due to natural succession resulting from previous logging activity may be an important factor in the declines (Bouta 1991; Ross and Johnson, unpublished data). The even aged structure of spruce forests that have reestablished may be approaching a successional stage that is too old and homogenous in character to be useful as spruce grouse habitat.

In 2012, a radio-collared spruce grouse died of West Nile Virus (A. Ross, pers. comm.). It is unknown whether spruce grouse are carriers of the virus or are susceptible to high levels of mortality from the disease.

Spruce grouse was classified as "highly vulnerable" to predicted climate change in an assessment of vulnerability conducted by the New York Natural Heritage Program (Schlesinger et al. 2011). Osborne et al. (2011) showed that the effects of mercury can be exacerbated in boreal species such as that use high-acid habitats such as peatlands such as spruce grouse.

Are there regulatory mechanisms that protect the species or its habitat in New York?

- No Unknown
 Yes

The spruce grouse is listed as an endangered species in New York and is protected by Environmental Conservation Law (ECL) section 11-0535 and the New York Code of Rules and Regulations (6 NYCRR Part 182). A permit is required for any proposed project that may result in a take of a species listed as Threatened or Endangered, including, but not limited to, actions that may kill or harm individual animals or result in the adverse modification, degradation or destruction of habitat occupied by the listed species.

Describe knowledge of management/conservation actions that are needed for recovery/conservation, or to eliminate, minimize, or compensate for the identified threats:

Ross and Johnson (unpublished data) began a habitat management experiment in an occupied spruce grouse site in 2008. Habitat is being experimentally managed to determine if and which habitat treatments will result in the greatest spruce grouse use. Once a habitat prescription plan is developed using results of this study, effective habitat management may take place at other sites in New York. Reintroductions are also necessary to restore genetic viability to the New York population and increase numbers of individuals to avoid imminent extirpation. A thorough description of conservation actions to lead to spruce grouse recovery can be found in the New York Spruce Grouse Recovery Plan (Ross and Johnson 2012).

Conservation actions following IUCN taxonomy are categorized in the table below.

Conservation Actions	
Action Category	Action
Land/Water Protection	Site/Area Protection
Land/Water Protection	Resource/Habitat Protection
Land/Water Management	Site/Area Management
Land/Water Management	Habitat & Natural Process Restoration
Species Management	Species Re-introduction

The NY Comprehensive Wildlife Conservation Strategy (CWCS; NYSDEC 2005) states the need for a management plan for high-altitude conifer forest birds that incorporates the results of the 2004 State Wildlife Grant study on boreal forest birds (Glennon 2010). The CWCS also includes recommendations for the following actions for boreal forest birds, which includes spruce grouse.

Habitat management:

___ Cooperate with private landowners to encourage land management strategies that favor spruce grouse, olive-sided flycatcher and other species dependent on early successional boreal forests.

Habitat monitoring:

___ Conduct field studies to determine causes for declines of species known to be declining.

Habitat research:

___ Complete an inventory and analysis of the distribution and abundance of boreal species.

Population monitoring:

___ Develop a long term monitoring program to determine population trends of boreal forest birds.

State land unit management plan:

___ Review Department wildfire management for Forest Preserve lands.

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