

# Northern flying squirrel, Prince of Wales

*Glaucomys sabrinus griseifrons*

Class: Mammalia  
Order: Rodentia

## Conservation Status

<i>Heritage</i>	<i>Agency</i>		
G Rank: G5T2	USFWS/NOAA:	BLM:	AA:
S Rank: S2	SOA: Species of Greatest Conservation Need	USFS:	IUCN:

Final Rank		
Conservation category: <b>II. Red</b>		
II = high status and either high biological vulnerability or high action need		
<u>Category</u>	<u>Range</u>	<u>Score</u>
Status:	-20 to 20	16
Biological:	-50 to 50	0.5
Action:	-40 to 40	-8
<b>Higher numerical scores denote greater concern</b>		

**Status** - variables measure the trend in a taxon’s population status or distribution. Higher status scores denote taxa with known declining trends. Status scores range from -20 (increasing) to 20 (decreasing).

<i>Population Trend (-10 to 10)</i>	<b>Score</b> 6
<p>Unknown. Increasing removal of old-growth forests, the species' principal habitat, suggests that populations in some areas could be declining (Suring 1992). Because logging continues within range and some populations may be already isolated (Smith et al. in preparation), likely declining trend continues, albeit diminishing (Smith, USFS, personal communication).</p>	
<i>Distribution Trend (-10 to 10)</i>	10
<p>Between 1954 and 1995, extensive portions of their range were clearcut (~25%). A substantial portion of range within Native Corporation and private land of which 80% has or will likely be logged in the near future (Smith 2004). Also, probability of persistence in isolated small OGRs and other small habitat patches is not very high, so distribution may be further reduced in near future (Smith and Person 2007). Decline may be less because of higher quality habitat at higher elevations (Smith, USFS, personal communication).</p>	
Status Total:	16

**Biological** - variables measure aspects of a taxon’s distribution, abundance and life history. Higher biological scores suggest greater vulnerability to extirpation. Biological scores range from -50 (least vulnerable) to 50 (most vulnerable).

<i>Population Size (-10 to 10)</i>	<b>Score</b> -2
<p>The total population size is estimated to be greater than 10,000 (p=0.25). The uncertainty in this estimate is related to paucity of information regarding quality of higher elevation forests" (Smith, USFS, personal communication). This crude population estimate is based on average densities and the putative unlogged forest that remain (Smith and Nichols 2004, USDA Forest Service 1997a).</p>	
<i>Range Size (-10 to 10)</i>	-2
<p>Prince of Wales and adjacent westerly islands, including the Barrier Islands (off southwest Prince of Wales), Dall Island, El Capitan Island, Heceta Island, Kosciusko Island, North Island, Orr Island, an unnamed island south of Garden Island, Prince of Wales Island, Suemez Island, and Tuxekan Island. Size of this area is ~14,000 km2, but 25% of POW old growth has been logged and their range does not include the entire 14,000 km2 - just where old growth or secondary mature forests (MacDonald and Cook 1996, 1999).</p>	
<i>Population Concentration (-10 to 10)</i>	2

Gregarious in winter, flying squirrels huddle together to conserve heat during cold weather. On Mitkof Island in Southeast Alaska, usually two or three same-sex or different-sex individuals were found grouped together (Bakker and Hastings 2002). Communal nesting does not affect broad-scale distribution (Smith 2007). Occurs on less than 25 islands.

**Reproductive Potential**

Age of First Reproduction (-5 to 5)

-5

Flying squirrels are a relatively K-selected rodent, with delayed age at first reproduction, seasonal breeder (1/year), relatively small litter, and large maternal investment into each offspring (Wells-Gosling and Heaney 1984, Smith 2007). There is evidence that the longevity can be 7 years in the wild. Northern flying squirrels typically do not breed until they are nearly a year old, or in some cases (Villa et al. 1999) after their second winter (Smith, USFS, personal communication).

Number of Young (-5 to 5)

1.5

One litter per year of 1-6 young, average 2-4.

**Ecological Specialization**

Dietary (-5 to 5)

1

Omnivorous; primary foods include hypogeous fungi (truffles; including *Elaphomyces*, *Hymenogaster*, and *Sclerogaster* spp.), above-ground fungi, lichens (especially *Bryoria* and *Usnea* spp.), green vegetation, berries, seeds, and insects. May also eat meat, young birds, and eggs (Fay and Sease 1985, Pyare et al. 2002). Considered less specialized than northern flying squirrels elsewhere (Smith 2004).

Habitat (-5 to 5)

5

Associated with old growth forests and complex young forests. Western hemlock-Sitka spruce forest is there primary habitat, especially for reproductive females (Smith and Nichols 2003). A study in SE found that peatland mixed-conifer is unlikely capable of sustaining population on small reserves and viability largely depends on the availability of upland old-growth forests with viability the highest in patches containing both habitat types (Smith and Person 2007). Also use peatland scrub-mixed-conifer forests where availability of large trees may limit populations. Trees with 10-49 cm dbh and 5-10 cm dbh, and down wood are ecologically significant correlates with squirrel densities on POW. Large trees >74 cm dbh were also found to be important in peatland scrub-mixed-conifer forests. Microhabitat use was highly correlated to vaccinium understory cover (Smith et al. 2004). Large-diameter trees are a limiting resource for squirrels in peatland-mixed conifer forest (Weigl and Osgood 1974). Den sites are usually in natural tree cavities or woodpecker holes in live trees (Mowrey and Zasada 1984, Bakker and Hastings 2002). May be more sensitive to landscape structure than stand structure (Smith et al. 2005). Isolation because of limited dispersal ability may reduce metapopulation viability (Smith et al. In preparation).

Biological Total: 0.5

**Action** - variables measure current state of knowledge or extent of conservation efforts directed toward a given taxon. Higher action scores denote greater information needs due of lack of knowledge or conservation action. Action scores range from -40 (lower needs) to 40 (greater needs).

**Score**

Management Needs (-10 to 10)

-10

Habitat not protected: timber harvest plans to remove 50-75% of old growth on POW Island are proposed, and 25% has been removed since 1954. Harvest open without closed season or bag limits (ADFG 2007a). Habitat restoration is needed in managed watersheds, especially northern POW. Active management (pre-commercial thinning and subsequent commercial thinning) of second-growth stands, especially where isolated patches occur (Smith et al., in preparation). The TLMP was revised in 1997 to incorporate sustaining terrestrial wildlife through a system of large and small old-growth reserves with connectivity maintained through riparian buffers (Hanski and Gilpin 1991, USDA 1997). POW flying squirrel was designated as an indicator species to monitor the effectiveness of the OGR strategy (Suring et al. 1993). The Prince of Wales Island flying squirrel was listed as a federal C2 candidate taxon in 1974. However, the United States Fish and Wildlife Service delisted this subspecies in 1986. Listed as IUCN endangered (IUCN 2007).

Monitoring Needs (-10 to 10)

10

Because logging continues within range and some populations may be already isolated (Smith et al. in preparation), likely declining trend continues, albeit diminishing. Develop technical basis for sampling protocol to conduct surveys and monitoring. In particular, need to determine probability of detection so as to be able to determine "absence" with statistical confidence (Smith, USFS, personal communication).

Research Needs (-10 to 10)

2

Habitat loss and fragmentation by logging is a limiting factor due to their dependency on old growth and large diameter trees for nesting. Movement capability in managed habitats may limit dispersal and increase risk to metapopulation viability in

managed landscapes (Smith et al. in preparation). Limiting factors known, but extent of impacts need study. Nuclear and mitochondrial DNA analyses provide evidence that this subspecies exhibits severely reduced genetic variation (Smith 2004). Although old-forest structural elements linked to reproduction (Smith and Nichols 2004, Smith et al. 2004), characterizing as OG dependant may be an overstatement (Smith et al. 2005). Need data on dispersal, especially relative to landscape structure (Smith et al. in preparation).

**Survey Needs (-10 to 10)**

-10

Sampling has occurred on north-central POW Island (Smith and Nichols 2003). Specimens have also been collected from the majority of the islands. There are 152 specimens of this subspecies (Arctos 2007).

Action Total: 

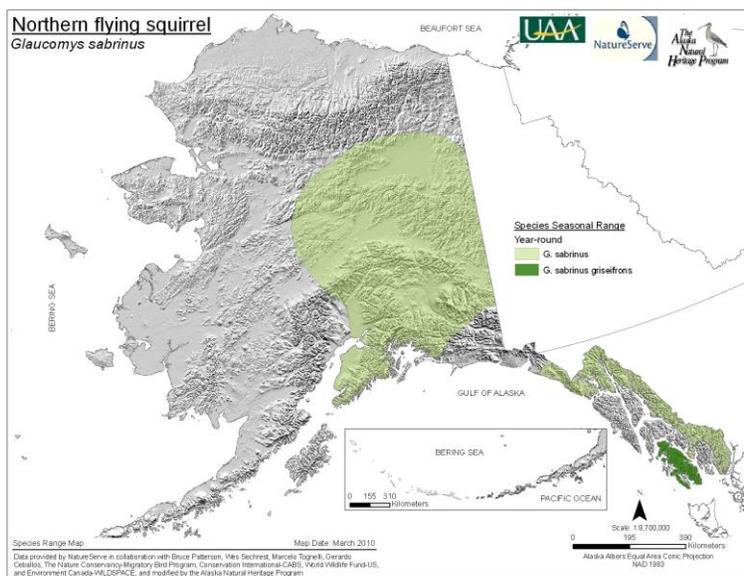
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 -8

**Supplemental Information** - variables do not receive numerical scores. Instead, they that are used to sort taxa to answer specific biological or managerial questions.

<b>Harvest:</b>	Not substantial
<b>Seasonal Occurrence:</b>	Year-round
<b>Taxonomic Significance:</b>	Subspecies
<b>% Global Range in Alaska:</b>	>10%
<b>% Global Population in Alaska:</b>	>25%
<b>Peripheral:</b>	No

**Range Map**



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Report authors: K. Walton, T. Gotthardt, and T. Fields

Alaska Natural Heritage Program

University of Alaska Anchorage

Anchorage, AK 99501

For details on the development of the ASRS and criteria, please see: Gotthardt, T. A., K. M. Walton, and T. L. Fields. 2012. Setting Conservation Priorities for Alaska's Wildlife Action Plan. Alaska Natural Heritage Program, University of Alaska Anchorage, AK.