Species list, breeding activities of alpine and subalpine birds on Hudson Bay Mountain and suggested mitigation for the Ski & Ride Smithers Ski Area Master Plan

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Species list

Species are indicated as abundant (seen almost every day) or occasional (seen once or several times over the course of the study). Species are indicated as breeding if nests were found or adults were seen with young of the year. I consider the alpine to be areas above treeline (beginning around 1600-1650m at this site), subalpine to be the meadows/ski runs that occur between rows of trees along the slope (around 1450-1600m), forest is anything below about 1450m. No relative abundance data are available for forest birds. This list is not exhaustive, but represents those species observed by the field crew and myself from May to August from 2003-2007.

Alpine Birds
American pipit (*Anthus rubescens*, abundant, breeding)
American robin (*Turdus migratorius*, abundant)
Baird's sandpiper (*Calidris bairdii*, occasional)
Common raven (*Corvus corax*, abundant)
Golden eagle (*Aquila chrysaetos*, occasional)
Horned lark (*Eremophila alpestris*, abundant, breeding)
Merlin (*Falco columbarius*, occasional)
Northern harrier (*Circus cyaneus*, occasional)
Osprey (*Pandion haliaetus*, occasional)
Red-tailed hawk (*Buteo jamaicensis*, occasional)
Rock ptarmigan (*Lagopus muta*, abundant, breeding)
Rosy finch (*Leucosticte tephrocotis*, abundant, breeding)
Savannah sparrow (*Passerculus sandwichensis*, abundant, breeding)
Sharp-shinned hawk (*Accipiter striatus*, occasional)
Surf scoter (*Melanitta perspicillata*, occasional)
Willow ptarmigan (*Lagopus lagopus*, abundant, breeding)

Subalpine Birds
American robin (*Turdus migratorius*, abundant, breeding)
Blue grouse (*Dendragapus obscurus*, abundant, breeding)
Clark's nutcracker (*Nucifraga columbiana*, abundant)
Cliff swallow (*Petrochelidon pyrrhonota*, abundant, breeding)
Dark-eyed junco (*Junco hyemalis*, abundant, breeding)
Fox sparrow (*Passerella iliaca*, abundant, breeding)
Golden-crowned sparrow (*Zonotrichia atricapilla*, abundant, breeding)
Gray jay (*Perisoreus canadensis*, abundant, breeding)
Hermit thrush (*Catharus guttatus*, abundant)
Savannah sparrow (*Passerculus sandwichensis*, abundant, breeding)
Varied thrush (*Ixoreus naevius*, abundant)
White-crowned sparrow (*Zonotrichia leucophrys*, occasional, breeding)
Winter wren (*Troglodytes troglodytes*, abundant)
Yellow-rumped warbler (*Dendroica coronata*, abundant)

Alpine/subalpine Mammals
(Brown?) Lemming (*Lemmus sibiricus*, abundant, breeding)
Chipmunk (*Tamias spp.* occasional)
Coyote (*Canis latrans*, occasional)
Gray wolf (*Canis lupus*, occasional)
Hoary marmot (*Marmota caligata*, abundant, breeding)
Mountain goat (*Oreamnos americanus*, abundant)
Mule deer (*Odocoileus hemionus*, occasional)
Porcupine (*Erethizon dorsatum*, abundant)
Red fox (*Vulpes vulpes*, abundant, breeding)
Short-tailed weasel (*Mustela erminea*, abundant, breeding)
Wolverine (*Gulo gulo*, occasional)

Forest Birds
American robin (*Turdus migratorius*)
Black-capped chickadee (*Parus atricapillus*)
Boreal chickadee (*Poecile hudsonica*)
Chipping sparrow (*Spizella passerina*)
Clark's nutcracker (*Nucifraga columbiana*)
Common raven (*Corvus corax*)
Dark-eyed junco (*Junco hyemalis*)
Fox sparrow (*Passerella iliaca*)
Golden-crowned kinglet (*Regulus satrapa*)
Golden-crowned sparrow (*Zonotrichia atricapilla*)
Gray jay (*Perisoreus canadensis*)
Hairy woodpecker (*Picoides villosus*)
Hermit thrush (*Catharus guttatus*)
Lincoln's sparrow (*Melospiza lincolnii*)
Mountain chickadee (*Parus gambeli*)
Northern flicker (*Colaptes auratus*)
Olive-sided flycatcher (*Contopus cooperi*)
Pacific-slope flycatcher (*Empidonax difficilis*)
Pine grosbeak (*Pinicola enucleator*)
Pine siskin (*Carduelis pinus*)
Red crossbill (*Loxia curvirostra*)
Red-breasted nuthatch (*Sitta canadensis*)
Steller’s jay (*Cyanocitta stelleri*)
Three-toed woodpecker (*Picoides tridactylus*)
Townsend's Solitaire (*Myadestes townsendi*)
Townsend's warbler (*Dendroica townsendi*)
Varied thrush (*Ixoreus naevius*)
Wilson's warbler (*Wilsonia pusilla*)
Winter wren (*Troglodytes troglodytes*)
Yellow-rumped warbler (*Dendroica coronata*)

Forest Mammals
Black bear (*Ursus americanus*, abundant, breeding)
Coyote (*Canis latrans*, occasional)
Grizzly bear (*Ursus arctos*, occasional)
Moose (*Alces alces*, occasional)
Mule deer (*Odocoileus hemionus*, abundant)
Pine marten (*Martes americana*, occasional)
Porcupine (*Erethizon dorsatum*, abundant, breeding)
Red Squirrel (*Tamiasciurus hudsonicus*, abundant)
Snowshoe hare (*Lepus americanus*, abundant)

Other
Western toad (*Bufo boreas*, one found dead on hiking trail)

Breeding activities of alpine/subalpine birds

Horned larks
Earliest known laying date
- 16 May
- They will begin nesting as soon as small snow free patches of ground appear.

Latest known active nest
- 06 August

Nest locations/placement
- Throughout the alpine tundra (the "prairie" area and the steep hillside above).
- Nests are built on the ground, usually below a small tuft of grass.

Savannah sparrows
Earliest known laying date
- 04 June
- They usually start breeding about two weeks after the horned larks.

Latest known active nest
- 06 August

Nest locations/placement
- Subalpine meadows/ski runs
- Throughout the alpine tundra (the "prairie" area and the steep hillside above).
- Nests are built on the ground, usually surrounded by vegetation and tall grass.

American pipits
Earliest known laying date
- 04 June
- They usually start breeding about two weeks after the horned larks.

Latest known active nest
- 14 July

Nest locations/placement
- Throughout the alpine tundra (the "prairie" area and the steep hillside above).
- Nests are built on the ground, usually dug into the hillside.

Mountain Goats

We begin to see goats in the end of June/beginning of July as the snow melts from the talus slopes above the tundra. We have seen up to 10 goats a day and they generally tend to avoid hikers. If you provide a map I can indicate where we most often see the goats.

Suggested Mitigations

During the development phase

- If possible limit construction to the winter months when the ground is snow covered. During the winter there is less wildlife in the area and no breeding birds. In addition, the vegetation will be protected by the snow.
- If construction is not possible in the winter, carry all building materials to the construction site during the winter to minimize impacts on the vegetation.
- Regardless of when construction occurs use designated "roads" for vehicles to reduce either snow compaction or damage to vegetation (alpine tundra is very slow to recover from disturbance and it could take years for vegetation to recover if trampled or destroyed).
- Limit construction to the end of August and into the fall to avoid disturbing nesting birds and other breeding wildlife.

Post development

- Conduct revegetation of areas impacted during the development phase.
- Establish easy to follow, well marked trails. All of the birds that breed in the alpine tundra must build their nests on the ground and are highly susceptible to disturbances at the nest (birds may abandon eggs or young after a perceived or real threat of predators). Often hikers will either intentionally or unintentionally leave the hiking trail and may trample vegetation and disturb wildlife. Consider using rope on either side of the designated trails to insure that hikers do not stray.
- Make the area off limits for dogs. Even if hikers remain on the designated trail, their dogs often do not. Dogs in the alpine often flush birds off their nests, destroy nests by eating the eggs or young, trample or dig up nests and vegetation and chase and/or kill other wildlife (such as marmots and lemmings). If dogs can not be excluded, strictly enforce an on-leash policy.
- Limit summer use to non-motorized activities.
- Use interpretive signs at the trailheads to educate visitors about the sensitivity and importance of alpine habitat and the presence of many breeding bird species.

Available Resources and Publications

Camfield, A.F., S.F. Pearson and K.Martin. 2008. *Submitted*. Comparative demography of horned larks: conservation implications and consequences for life history studies. Ecological Applications. MS#08-0152.

Camfield, A.F., A.J. Clason and K. Martin. 2007. Mother-son parental care in horned larks. The Wilson Journal of Ornithology 119(2):303-305.

Centre for Alpine Studies (http://www.forestry.ubc.ca/alpine/)

Clason, A.J. 2007. Recreation and alpine songbirds: Impacts of hikers on populations of alpine breeding horned larks (*Eremophila alpestris*), savannah sparrows (*Passerculus sandwichensis*) and American pipits (*Anthus rubescens*). Honors Thesis. University of British Columbia.

Davidson, P., Wilson, S., Bears, H., Camfield, A., and Martin, K. 2007. Birds in high places. BirdWatch Canada. 41: 4-7.

Pearson, S.F., Camfield, A.F., and Martin, K. 2008. Streaked Horned Lark (*Eremophila alpestris strigata*) fecundity, survival, population growth and site fidelity: Research progress report. Washington Department of Fish and Wildlife, Wildlife Science Division, Olympia, WA.

Wilson, S. and K. Martin. 2005. Songbird use of high-elevation habitat during the fall post-breeding and migratory periods. Ecoscience 12:561-568.