

Bald Eagles

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What is happening with bald eagles in Howe Sound?

Large numbers of bald eagles are drawn each year during the late autumn and winter to the Squamish Valley to feed on spawning salmon. Thousands of visitors flock to the Brackendale area to see this spectacle of nature. Each weekend from November to January, Eagle Watch volunteers provide visitors with telescopes or binoculars for eagle viewing along the Squamish River at Brackendale.¹ In 2015, the Eagle Watch program of the Squamish Environment Society celebrated its 20th year. January 2016 was also the 30th anniversary of the Brackendale Winter Festival and Eagle count, sponsored by the Brackendale Art Gallery. Dozens of volunteers led by Thor Froslev count eagles each January. In 1994, 3,769 eagles were counted, a world record at the time. In January 2016, the count was only 411 eagles, the lowest count on record. This low number was likely due to late autumn and early winter floods that swept salmon carcasses to the sea, and forced eagles to move elsewhere for food, such as the Fraser River delta, which saw high numbers.²

Why are bald eagles in Howe Sound important?

Bald eagles are versatile and opportunistic feeders, exploiting a wide range of foods. In coastal British Columbia, they prey predominantly on fish, seabirds, waterfowl, intertidal invertebrates, small mammals and even gull eggs³ and carrion of all sorts. On occasion, they do take small domestic animals. In spring most eagles migrate north along the coast or inland to nest. Some eagles nest along the coast, choosing large old trees close to shoreline areas where they can forage for food. Eagles move back to the coast after salmon spawning begins in late August and September and spent salmon carcasses become available.⁴ Eagles gorge on food when it is available and then can digest it over several days. They can survive days and even weeks of fasting which allows them to take full advantage of seasonally abundant food sources.

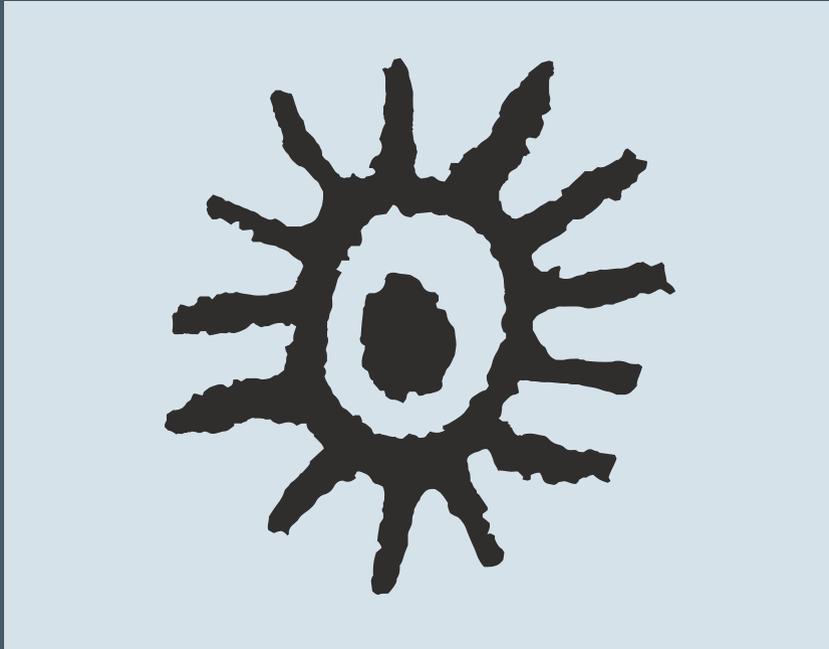
Bald Eagle numbers in the Pacific Northwest have rebounded tremendously over the past decades following restrictions on hunting, lead shot, and contamin-

ants such as DDT and PCBs.⁵ There are, however, still concerns of their being exposed to persistent dioxins and furans (pulp mill pollutants). Historically the lower Squamish River Valley has been a major winter feeding ground for bald eagles along the south coast, arriving during the annual chum salmon runs from mid November to mid February.⁶ Because of the eagles, Brackendale is identified as one of Canada's Important Bird Areas (IBA).⁷ The IBA Program is an international conservation initiative coordinated by BirdLife International with Canadian co-partners Bird Studies Canada and Nature Canada. In 1999, Brackendale Eagles Provincial Park was established to protect 755 hectares of prime habitat for winter roosting and foraging by eagles.⁸ Because of our admiration for these great birds, eagle watching has become an important part of the Squamish lifestyle and tourist economy and celebrated through the Eagle Watch program and Eagle Festival.^{1,6,9}



Bald eagle in near shore habitat. (Photo: Gary Fiegehen)

Do bald eagles have a particular connection to First Nations?



“Cultures all over the world have similar ways of depicting the sun. In Squamish mythology, the sun comes to the earth in the form of an eagle.”¹⁰

What is the current state of bald eagles?

Bald eagles flock to the lower reaches of the Squamish River during the mid winter chum salmon runs. Most of what we know about bald eagles comes from winter counts during this period. Scientific counts of the transitory eagle population likely began with the advent of the awakening of the coastal estuary crisis

in the early 1970s¹¹ but this task was soon overtaken by citizen initiative counts beginning with the annual Christmas Bird Count in Squamish in 1980 and the Brackendale Eagle Festival, sponsored by enigmatic and irrepressible Thor Froslev of Brackendale, in the winter of 1985/86. The Christmas Bird Count

BALD EAGLE COUNTS IN THE HOWE SOUND AREA

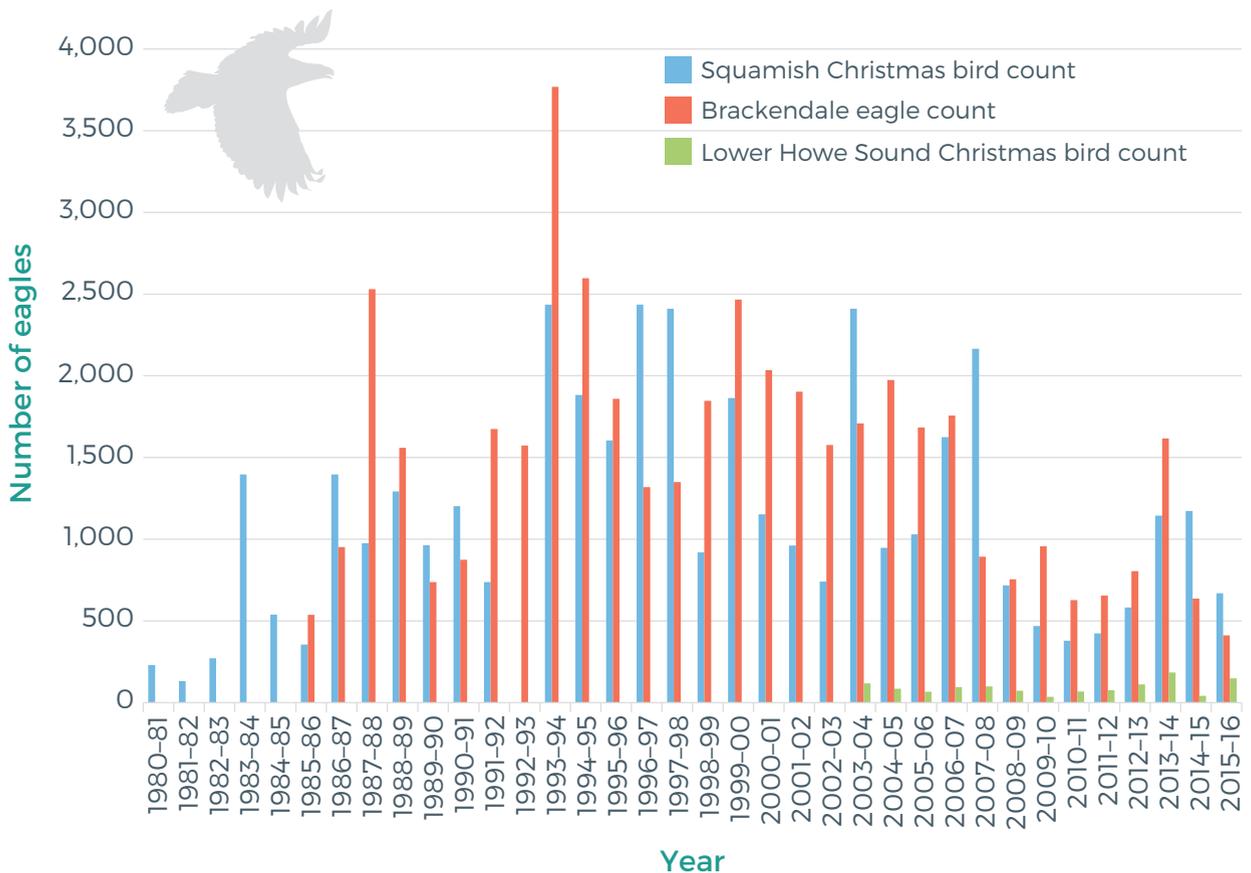


Figure 1. Counts of bald eagles in the Howe Sound basin from three regular bird counts.¹² Note the variability and the lower numbers in recent years.

at Squamish usually takes place in mid December, whereas the Brackendale Festival Count is usually in early January. The early January count encompasses all parts of the Squamish River watershed where salmon carcasses are found including the lower reaches of the Ashlu and Elaho rivers, the Cheakamus River up to the end of the road in Paradise Valley, and the Mamquam River upstream to the powerhouse. On the other hand, the area surveyed in mid-December extends only 15 kilometres upstream into the Squamish River basin. Fortunately, it covers the lower reaches of the Mamquam, Cheakamus and Squamish Rivers where eagles are most abundant.

Weather and human factors can affect the reliability of eagle counts. On one count, a heavy snowfall blanketed the trees and likely caused white-headed eagles to be overlooked, especially in distant viewing areas. In another year, rafts failed to launch, thus 15 kilometers of an otherwise unreachable section of the Squamish River remained uncounted. In yet another year, the count occurred during a deep freeze and a biting north wind. The eagles retreated from exposed sites, deep into the shelter of dense forest and out of view of many counters. Wind or other disturbance can cause birds to leave their tree perches too early in the day for the count. Once airborne, eagles fly in huge circular “kettles” which move erratically from one count sector to another, confusing the counters below. Despite these shortcomings, the manager of the early January count, Thor Froslev, maintains that the overall accuracy is out by no more than five percent.

Winter resident eagles frequent the islands and mainland shorelines at the entrance to Howe Sound. However, eagles counted during the Lower Howe Sound Christmas bird count surveys, begun in 2003, are less

than 10 percent of winter counts in the Squamish area. Year-round residents within the Sound are also low in numbers and their nests are far apart and few. For example, there are only two nests at the Squamish Estuary and one in Lighthouse Park near the entrance to the Sound.

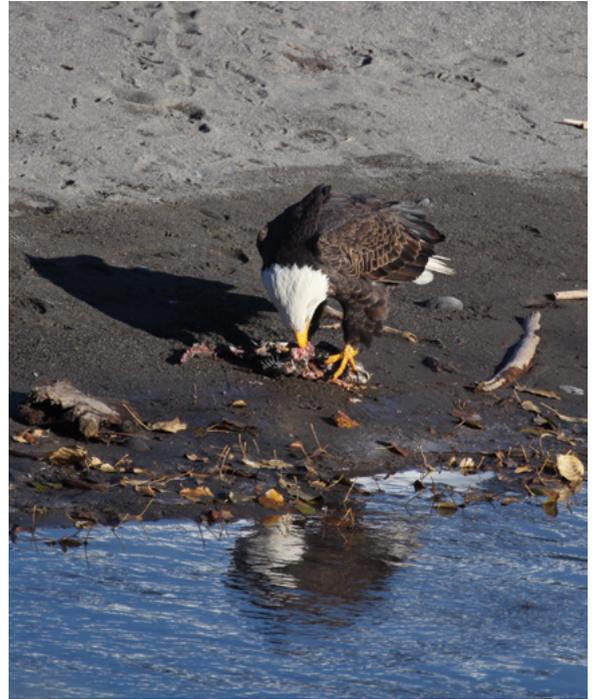
Are there hot spots in the counts? Contrary to popular thought, the site of the 20-year old Eagle Watch Program¹ on the river dike at Brackendale is not, but it is a handy spot to see some, and volunteers provide spotting scopes to watch them. The 36 years of winter counts invariably shows the greatest concentration of eagles on the lower reach of the Cheakamus River and its confluence with the Squamish River, where the primary author usually does his observations for each count. Upstream, areas near the Cheakamus Center and Tenderfoot Hatchery typically host large numbers. More rarely the artificial spawning channels on the lower Mamquam River, and the Ashlu and Elaho tributaries provide counts that number in a few hundred eagles. There are also anomalous years with unusual hotspot locations. In the 2015/16 count season, the Squamish municipal landfill provided the highest number of the paltry 411 eagles counted for the early January survey. In that year there were virtually no fish carcasses in or beside the rivers; they had been swept away by late autumn and early winter storm events, forcing eagles to other food sources, including the tasty fare of thousands of gulls at the landfill.

Comparing the two winter eagle surveys in Figure 1, there are 19 years of higher counts for the more extensive early January count, as would be expected, but, surprisingly, nine other years where the earlier but less extensive Squamish survey had the higher numbers. That is, the higher count was in mid-December as op-

posed to early January. Why? Furthermore, over the three decades that both surveys have been conducted, only three years have produced very high counts in both surveys (i.e. 1993/94, 1994/95 and 1999/2000). Both of these observations indicate a large variation in eagle populations over the course of any given winter season. The “finger” points to the following to account for the discrepancies: (1) high runoff storms are removing spent fish carcasses (usually chum and perhaps coho salmon); (2) the spawning runs of either species were low or arrived early; and (3) both possibilities together.

The data for the 35 years of eagle counting allows some summary observations: eagle counts were low in the period of 1980 to 1985, generally high for 1993 to 2000, and low again in the last eight years (2008 to 2015/16), with one year above-average in 2013/14. While the numbers are low in the last few years, it does not mean that eagles are disappearing. Eagles are very opportunistic and move elsewhere for their winter food,² Harrison River counts have been high in recent years, and in 2016 there was such an unusual abundance at Burns Bog and nearby Fraser River delta that it attracted news media attention.¹³ The Brackendale Festival, however, suffered an all-time low of 411 eagles in 2015/16. This has prompted the organizers to re-schedule next year’s count to early December in the hope that eagle numbers will be higher then.

Bald eagles are very dependent on chum salmon runs for food during the early and mid winter when adult eagle mortality is high.⁵ When salmon are not available, eagles turn to less favourable prey such as gulls, marine birds, and landfill waste. Climate models for coastal B.C. suggest that flood events in late autumn and early winter due to storms and rain-on-snow



Bald eagle. (Photo: Thor Halvorson)

events will increase in magnitude and frequency with future climate change.¹⁴ Such increased future floods will pose the risk of larger and more frequent flushing of salmon carcasses to the sea, depriving eagles of important winter food supplies, causing eagles to move from the lower Squamish valley to places with alternative food supplies such as the Fraser delta. Overall, while continental populations of bald eagles may be increasing, their geographic range is gradually shrinking due to habitat loss.

What is being done?

The Eagle Watch Volunteer Interpretive program of the Squamish Environmental Society educates visitors about eagle biology and viewing ethics during winter weekends and the Christmas week at the Eagle Run dike in Brackendale, one of the easiest access sites

in the Squamish Valley.^{6,15} Each year the Brackendale Winter Eagle Festival and Count promotes education and awareness of eagles with lectures and events.¹⁶ The annual Christmas Bird Counts in Squamish and lower Howe Sound also observe and count eagles.



Bald eagle. (Photo: Thor Halvorson)

What can you do?



Individual and Organization Actions:

- Learn more about eagles by watching live streaming web cams of eagle nests (see “Resources”) or by attending Eagle Watch at Brackendale during the winter.
- Use proper viewing ethics when watching eagles. Do not disturb eagles feeding or roosting.
- Know the rules that protect eagles. It is an offense to possess, take, injure, molest, or destroy a bird or its eggs. Eagle nests are protected year round, whether or not the nest is in use, by the B.C. Wildlife Act.¹⁷
- Adopt the best practices guidelines for protecting eagle nests during development that include identification of eagle nests before development and the establishment of a vegetated no-disturbance buffer zone around the nest tree.¹⁸



Government Actions and Policy:

- Empower local stewardship by increasing public bald eagle education efforts and education of regulations of the B.C. Wildlife Act, and locations of eagle nests and Important Bird Areas. Increase enforcement of activities restricted in the B.C. Wildlife Act.
- Closely monitor and manage prey species populations, specifically to ensure adequate chum runs are available to support eagle populations.
- Legally recognize and strictly regulate Important Bird Areas as Protected Areas, especially in IBAs that do not have established legal protection (e.g. National and Provincial Parks). Where this is not feasible, consider conservation easements and agreements, private land stewardship, and land acquisition to ensure protection.
- Legislate against the production and use of harmful chemicals (e.g. POPs).

Resources

Eagle Watch, Squamish Environmental Society
squamishenvironment.ca/programs/eaglewatch/

Brackendale Winter Eagle Festival
brackendaleartgallery.com/Festival.html

Squamish as an Important Bird Area of Canada
ibacanada.ca/site.jsp?siteID=BC023

Eagle nest cams in Vancouver region
hancockwildlife.org/index.php?topic=cam-sites

Footnotes

¹ Murray, L. 2016. Squamish eagle watch celebrates 20 years. B.C. Nature 54(1): 15.

² Murray, A. 2016. More eagles flocking to Fraser Delta for winter. B.C. Nature 54(1): 24-25.

³ Blood, D.A. and G.G. Anweiler. 1994. Status of the bald eagle in British Columbia. Wildlife Branch, Ministry of Environment, Lands, and Parks.

⁴ Campbell, W., N.K. Dawe, I. McTaggart-Cowan, J.M. Cooper, G.W. Kaiser, and M.C. McNall. 2007. Birds of British Columbia, Volume 2: Nonpasserines-Diurnal Birds of Prey through Woodpeckers. UBC Press.

⁵ Elliott, K.H., J.E. Elliott, L.K. Wilson, I. Jones, and K. Stenerson. 2011. Density-dependence in the survival and reproduction of bald eagles: linkages to chum salmon. The Journal of Wildlife Management 75(8): 1688-1699.

⁶ Booth, B.P. and M. Merckens. 1999. A case history of community-based involvement in the management of a species at risk: wintering bald eagles in the Squamish Valley. In L.M. Darling (ed.), Proceedings of a Conference on the Biology and Management of Species and Habitats at Risk. BC Ministry of Environment, Lands and Parks, Victoria, BC and University College of the Cariboo (pp. 15-19). Accessed July 20, 2016. <http://www.env.gov.bc.ca/wld/documents/st10booth.pdf>.

⁷ Important Bird Area BC023, Squamish River area, Squamish, British Columbia. Accessed July 20, 2016. <http://www.ibacanada.ca/site.jsp?siteID=BC023>.

⁸ Brackendale Eagles Provincial Park. Accessed July 20, 2016. http://www.env.gov.bc.ca/bcparks/explore/parkpgs/brackendale_eagles/.

⁹ Smith, K.C. 2001. Tourism product development: A case study of wildlife viewing in the Squamish valley. Simon Fraser University. Accessed July 20, 2016. http://research.rem.sfu.ca/theses/SmithKim_2001_MRM284.pdf.

¹⁰ Reproduced with permission from “Where Rivers, Mountains and People Meet”, Squamish Lílwat Cultural Centre

¹¹ Hoos, L. and C. Vold. 1975. The Squamish River Estuary Status of Environmental Knowledge to 1974. Special Estuary Series #2. Environment Canada.

¹² Brackendale Art Gallery, 2000-2016. Records of the Brackendale eagle count.

¹³ Pynn, L. 2016. “Ladner landfill becomes bald eagle haven.” Vancouver Sun. Accessed July 20, 2016. <http://www.vancouversun.com/technology/ladner+landfill+becomes+bald+eagle+haven/11729098/story.html>

¹⁴ Loukas, A., L. Vasiladias, and N.R. Dalezios. 2002. Potential climate change impacts on flood producing mechanisms in southern British Columbia, Canada using the CGCMA1 simulation results. Journal of Hydrology. 259(1): 163-188.

¹⁵ Squamish Estuary Society. Accessed July 20, 2016. <http://www.squamishenvironment.ca/programs/eaglewatch/>.

¹⁶ 30th Annual Brackendale Winter Eagle Festival and Count. Accessed July 20, 2016. <http://www.brackendaleartgallery.com/Festival.html>.

¹⁷ Develop with Care. Fact Sheet #10 Bald Eagles and Ospreys. Environmental Guidelines for Urban and Rural Land Development in British Columbia. Accessed July 20, 2016. <http://www.env.gov.bc.ca/wld/documents/bmp/devwithcare/Fact-Sheet-10-eagles-osprey.pdf>.

¹⁸ Province of British Columbia. 2013. Guidelines for Raptor Conservation during Urban and Rural Land Development in British Columbia (2013). Including Appendix B: Raptor Webcam Guidelines: An Addendum to Best Management Practices for Raptor Conservation during Urban and Rural Land Development in British Columbia. Accessed July 20, 2016. http://www.env.gov.bc.ca/wld/documents/bmp/raptor_conservation_guidelines_2013.pdf.