

Conservation Values of the Proposed Selkirk Mountains Ancient Forest Park



Craig Pettitt

Big Trees, Grizzly Bears, Mountain Caribou, Fish and a Karst Ecosystem in the Inland Temperate Rainforest

Submission to the Governments of British Columbia
and Canada for Provincial or National Park Status

Initially Proposed in 2011 as the Selkirk Mountain Caribou Park
Revised Boundaries, July 2024

Valhalla Wilderness Society

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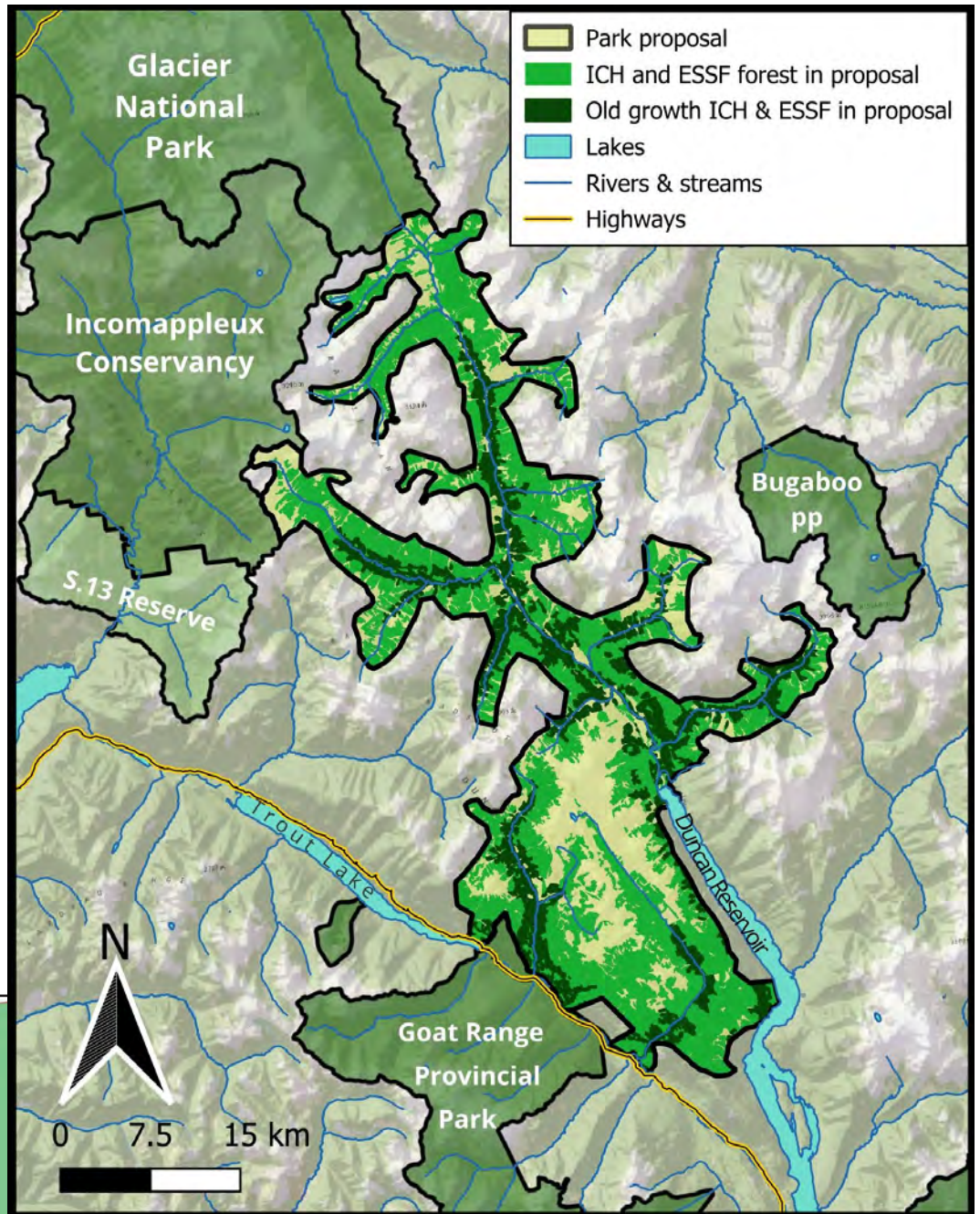
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PROPOSED SELKIRK MOUNTAINS ANCIENT FOREST PARK NEEDED TO CONNECT FOUR IMPORTANT EXISTING PROTECTED AREAS

This park proposal is in the traditional territory of the Sinixt First Nation, also known as the Arrow Lake Indians. The area is also claimed by the Syilx, Ktunaxa and Secwépemc First Nations.



The 102,034-hectare park proposal is critical to connecting four existing protected areas: Glacier-Mt. Revelstoke National Park and Incomappleux Conservancy and Goat Range and Bugaboo provincial parks. Together this would create a large protected complex in the Selkirk Mountains, ensuring landscape connectivity and significant habitat protection for mountain caribou, grizzly bears, wolverines and high levels of smaller biodiversity.

SELKIRK MOUNTAINS ANCIENT FOREST PARK PROPOSAL

Remnant intact old-growth of the southernmost Inland Temperate Rainforest

Our planet, forests, and people's lives, are in extreme peril from climate change. We desperately need to remove climate-warming carbon dioxide from the air. Scientists have said that forests are currently the only proven means of removing and storing atmospheric carbon at a scale that can contribute to fighting climate change.

The primeval forest of the Incomappleux Valley was originally part of this proposal, but as of 2023 it is now protected as a Conservancy. However, it was only a small part of the old-growth forest needing protection in the area.

Big-tree old-growth forest absorbs much more carbon faster, and stores much more carbon in its wood and soil, than younger forest. Old-growth with big trees usually means wet forest, and these forests are more resistant to fires than younger forest.

Unfortunately, BC's big-tree old-growth is almost gone. BC's Old-Growth Technical Advisory Panel (TAP) found that many forests that produce big trees have less than 10%, and some less than 1% of their historic amount of old-growth.

This park proposal contains 49,220 hectares of old growth Inland Temperate Rainforest and spruce-fir forest. This includes 13,207 ha. of TAP old-growth recommended for immediate deferral of logging.

BC has over 2,000 species at risk. Scientists warn that this will eventually cause ecosystem collapse that will harm us all. ***BC's Conservation Data Base lists 209 species at risk potentially in this park proposal area.***

However, if we save only the oldest trees and log the rest, we are dooming many species to a slow disappearance. Our grizzly bears need well-connected roadless areas for core se-



Douglas Noblet

Main Duncan River Valley

curity habitat. Our mountain caribou can only survive with large areas of intact forest 140 years or older. Even elk and moose are disappearing from areas where too much has been logged.

Unless they are connected by corridors of natural habitat, isolated parks become islands of extinction for wildlife. Rivers are natural wildlife corridors that offer easy travel in an area of steep, rugged mountains. Even small species need corridors for dispersal. This park proposal includes parts of three rivers, and several large creek valleys, to connect three existing parks. It contains significant stands of old and sometimes ancient forest. There is also a unique ecosystem of karst formations and Inland Temperate Rainforest.

CRITICAL HABITAT FOR THREE LARGE MAMMALS AT RISK



Karl Gfroerer



Craig Pettit

Both photographs were taken at approximately the same place on the Lardeau River, in the connectivity corridor between Goat Range Provincial Park and this park proposal. The grizzly bear was one of many that come down from both sides of the valley to feed on spawning Kokanee salmon in autumn, where they are photographed by many people from all over the region.

This park proposal comprises approximately half of the range of the Central Selkirk Mountain Caribou herd.

The Central Selkirk Mountain Caribou herd had 98 animals when the park proposal was launched in 2005. The 2023 census found only 25. The cows are now confined in a maternity pen each year to have their calves, with some success in birth of calves but so far there has been no report of increased recruitment. The 2023 census found six caribou in Lake Creek within this park proposal. VWS wildlife biologist Wayne McCrory recently documented caribou tracks along the Duncan River.

A large part of this park proposal is Ungulate Winter Range (UWR) for caribou. The UWR is neither permanent nor complete protection. It does not cover the other 209 species at risk listed for this habitat in BC's Conservation Data Base.

In 2009 the BC government designated a large percentage of this park proposal, in the Westfall, Duncan and Lardeau River watersheds, as no logging Ungulate Winter Range (UWR) for Mountain Caribou. However, UWR is not protected from energy, mining or tourism development, and there are provisions to allow some logging and logging roads if the company deems it profitable. Worse, the UWR can be revoked if the caribou fail to thrive, and this is easy because there is no law for UWRs, only policy that can be revoked with the next government. Revoking the UWR could leave up to 208 other species at risk without protec-

tion. Park status would make the protection legal and permanent, and would include key caribou areas that were omitted from the UWR.

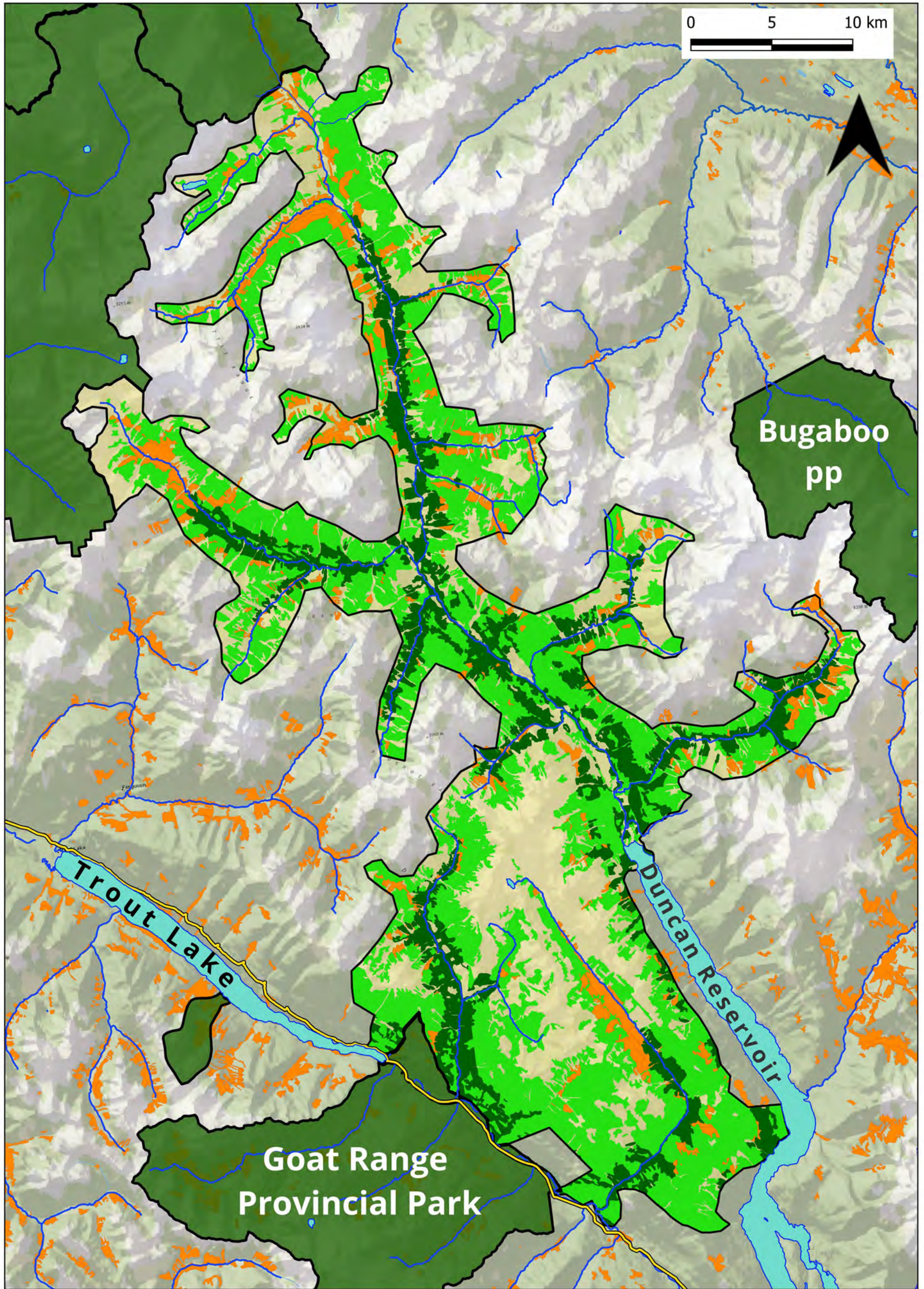
Grizzly Bears, Wolverines and many other species need protection too.

The extirpation of grizzly bears from most of the US has proceeded north, as the human population expands, into BC, leaving small threatened populations in the southern Selkirk and Purcell Mountains. Further north, both Valhalla and Kokanee Glacier Provincial Parks have small and diminishing grizzly populations. But the park further north — the Goat Range Provincial Park — is in the most southerly area in the Selkirk Mountains that has relatively healthy numbers of grizzly bears.

Grizzly bear biologists say that the populations around Goat Range Provincial Park and the Purcell Conservancy are critical for the survival of the fragmented populations to the south (Proctor et al. 2011). These grizzly bears need their protected habitat to be connected.

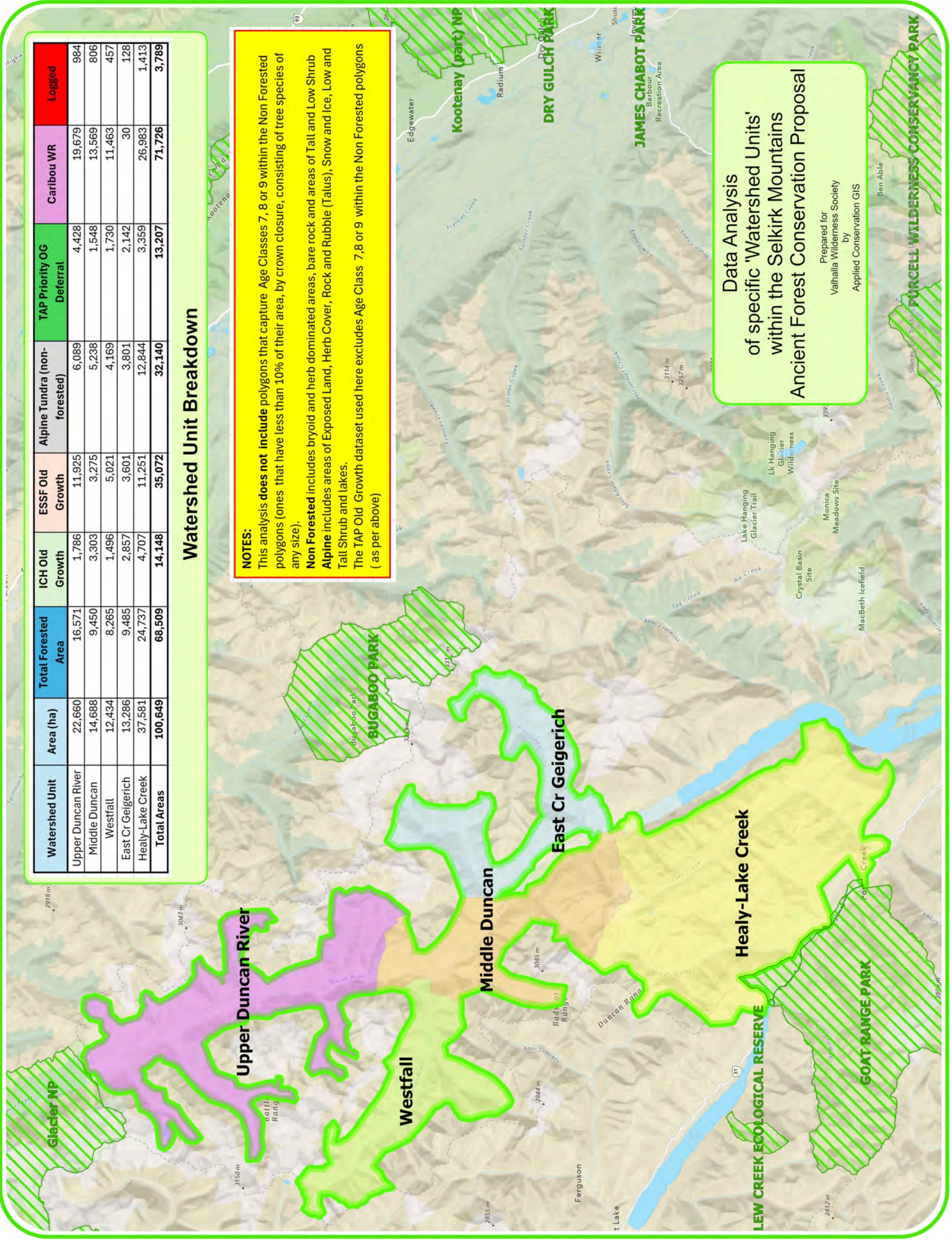
There are persistent sightings of wolverines in the valley-bottom in the Lardeau River in winter. Research has found the Selkirk range north of Highway 31A has the highest density of wolverines so far determined in the West. Most parks in BC are too small to protect core wolverine habitat. Protection of large refugia free of human intrusion is essential to their long-term existence.

Selkirk Mountains Ancient Forest Park Proposal



- Proposal area
- Protected areas
- Lakes
- Highways
- Rivers
- Forested area in proposal
- Old growth ICH & ESSF in proposal
- TAP Priority Deferrals

Selkirk Mountains Ancient Forest Park Proposal
Prepared for Valhalla Wilderness Society
by Amber Peters
01/08/2024 - NAD 1983 BC Environment Albers



Watershed Unit	Area (ha)	Total Forested Area	ICH Old Growth	ESSF Old Growth	Alpine Tundra (non-forested)	TAP Priority OG Deferral	Caribou WR	Logged
Upper Duncan River	22,660	16,571	1,786	11,925	6,089	4,428	19,679	984
Middle Duncan	14,688	9,450	3,303	3,275	5,238	1,548	13,569	806
Westfall	12,434	8,265	1,496	5,021	4,169	1,730	11,463	457
East Cr Geigerich	13,286	9,485	2,857	3,601	3,801	2,142	30	128
Healy-Lake Creek	37,581	24,737	4,707	11,251	12,844	3,359	26,983	1,413
Total Areas	100,649	68,509	14,148	35,072	32,140	13,207	71,726	3,789

Watershed Unit Breakdown

NOTES:
 This analysis **does not include** polygons that capture Age Classes 7, 8 or 9 within the Non Forested polygons (ones that have less than 10% of their area, by crown closure, consisting of tree species of any size).
Non Forested includes bryoid and herb dominated areas, bare rock and areas of Tall and Low Shrub
Alpine includes areas of Exposed Land, Herb Cover, Rock and Rubble (Talus), Snow and Ice, Low and Tall Shrub and lakes.
 The TAP Old Growth dataset used here excludes Age Class 7,8 or 9 within the Non Forested polygons (as per above)

Data Analysis
 of specific "Watershed Units"
 within the Selkirk Mountains
 Ancient Forest Conservation Proposal

Prepared for
 Valhalla Wilderness Society
 by
 Applied Conservation GIS

Duncan River

The Duncan River was once a vast valley of ancient Inland Temperate Rainforest used by mountain caribou. The most easily accessible old-growth in the main valley has been logged, but significant groves and stands remain. Numerous tributaries were not logged and some contain extensive tracts of ancient rainforest. Slopes of forest in the main valley that have been logged or burned are substantial, but are recovering and provide connectivity for wildlife such as grizzly bears. The forest type is the “wet” form of Interior Cedar-Hemlock (ICHwk). The proposal covers about 75 kilometres of low- and mid-elevation forest above the Duncan Dam reservoir.



Craig Pettit



A. Sherrod

Duncan River near the mouth of Alicia Creek.

Westfall River

The Westfall River is a tributary to the Duncan River. About a quarter of the valley bottom old-growth forest has been logged, but there are extensive intact slopes of old-growth cedar-hemlock forest above the river, including the giant tree below, which is likely in the 1,000-year-old range. This valley has been designated by the government as “no logging” Ungulate Winter Range for Mountain Caribou, but this designation is not fully protected, can be further fragmented by tourist and hydro development, and can be deleted with the stroke of a pen if the caribou fail to recover.



Westfall River photos by Gary Diers



Major Kootenay Lake Fishery Depends on Park Proposal Rivers



Craig Pettitt

Rivers and streams in this park proposal are critical spawning habitat for Kokanee salmon (right) and bull trout (left) of Kootenay Lake, which has a very lucrative fishing economy. Many millions of dollars have been spent to boost the number and size of fish, but little protection is provided for the upstream habitat that produces them.



Craig Pettitt

Fishing in Kootenay Lake is world famous, especially because it has genetically unique, giant Gerrard rainbow trout and bull trout. The fishery is a major tourist attraction and source of income for communities around the lake. The lake is not in the park proposal, but the bull trout and kokanee salmon need moving, well-aerated water to lay their eggs. This need is provided by the Duncan, Westfall and Lardeau Rivers in this park proposal. A dam on the Duncan River near the head of Kootenay Lake influences fish spawning. Above the dam reservoir, the Upper Duncan River flows for 100+ kilometres and is in this park proposal.

Kokanee: Land-locked Sockeye Salmon

Kokanee are not the most prized species for fishing, but there would be few trophy fish in Kootenay Lake if it weren't for the kokanee, because they are the keystone species of the fish ecosystem — the primary food of bull trout and Gerrard Rainbow. The kokanee that spawn in the Upper Duncan River are not from Kootenay Lake, because they can't get through the dam, but there is a large resident population in the reservoir that spawns in the Upper Duncan River. In one

year there were over 14,000 spawning kokanee in the four kilometre section above East Creek. That's enough to draw grizzly bears from far and wide, and there are accounts of just such gatherings on the Upper Duncan River. The Lardeau River does not have a dam, so the kokanee have unimpeded access from Kootenay Lake to the river.

The Lardeau River also hosts most of the migrating Gerrard rainbow trout, which naturally occur only in Kootenay Lake. This park proposal contains only a small stretch of the Lardeau River, but it would protect a much longer stretch of slopes above the river. Protecting them from further logging and mining would protect the river channel stability and water quality necessary to maintain the fish.

Bull Trout

Bull trout from Kootenay Lake spawn in all three rivers in this proposal. They can migrate directly from Kootenay Lake because they are mechanically transported through the Duncan Dam and into the reservoir, from which they migrate the full 100+ kilometres of the Upper Duncan River. They spawn in almost every tributary of the Upper Duncan, but the Westfall River is the major spawning site.

Bull trout are a species at risk listed as Special Concern by BC and Canada. They are threatened by dams, logging, overfishing and introduced fish species, of which there are a number in Kootenay Lake and its tributaries. There are at least eight species of fish in the system, native and non-native, besides the three featured here.

With dams near both ends of Kootenay Lake, and a series of management mistakes, the fish ecosystem is far from healthy. The kokanee have crashed several times. Despite millions of dollars spent by the province to mitigate the damage, a slow decline has continued. Climate change may be a factor, but it is also recognized that extensive logging in the Duncan Valley has damaged the fish habitat by causing river channel instability and other impacts. In the fall of 2023 observers saw increased kokanee spawning.



A. Sherrad

Lardeau River

BC's Conservation Data Base lists 209 species at risk potentially in the park proposal, including 172 animals and 25 plants. However, a great many species have never been assessed, while lichens have been only partially assessed.

Rivers with low-elevation, wet forest combine riparian and rain-forest species. Examples of small riparian species known in the area include at least ten species of fish, Coeur d'Alene salamanders, western toads, and great blue herons. A significant wetland above the Duncan dam adds wetland species, and a willow thicket sure to attract wildlife.



Douglas Noblet

Upper Duncan River



Toby Spribille

Nephroma occultum

Report on Lichen Survey of the Upper Duncan River Area

“This brief survey ... yielded a rich oceanic lichen macroflora, including many of the same species that have already been documented for the Incomappleux River to the west (Spribille 2002), including the COSEWIC Species of Concern *Nephroma occultum* The Duncan Valley lichen flora reflects its high precipitation and can be characterized as a typical BC inland rainforest lichen flora.”

Dr. Toby Spribille, 6 Aug 2004



Craig Pettitt

Upper Duncan River Valley

- Inland Temperate Rainforest is Interior Cedar-Hemlock (ICH) forest. The predominant trees are Western Redcedar and Western Hemlock.
- Only the “wet” (ICHwk) and “very wet” (ICHvk) subzones are considered rainforest. It exists in only 2 other places in the world, in a highly fragmented condition.
- In BC, two regions have wet ICH forest east of the Coast Range, but the forest in the Interior Wetbelt is distinc-

Inland Temperate Rainforest is the climax forest at low and middle elevations in the Interior Wetbelt. This forest produces spectacular Big Tree Old Growth, but it has been targeted and largely liquidated by logging. Rainforest protection on the BC mainland coast: about 30%. Protection of the Inland Rainforest Region: about 18%.

tive in that it lies 400-500 kilometres from the ocean.

- Inland Temperate Rainforest hosts many coastal species that do not otherwise occur inland, but its ecology is different from coastal rainforest. A large part of the precipitation falls as snow, so there are both coastal and boreal species.
- The very wet ICH forests support hundreds of species of lichens — 300 lichen species have been identified in the Incomappleux Valley alone.

TRIBUTARIES OF THE DUNCAN RIVER



Gary Diers

Westfall River Valley

The Duncan River originates in glaciers just outside the boundary of Glacier National Park, and flows between the Selkirk and Purcell Mountains. High in the Selkirks, near the height of land between the Incomappleux and Duncan drainages, the Westfall River arises and wends its way toward a confluence with the Duncan River. The Westfall part of this proposal would connect with Boyd Creek in the new Incomappleux Conservancy and form an important east-west corridor across the spine of the Selkirk Mountains, also providing connectivity to Glacier National Park. It would add important mountain caribou habitat that was omitted from the Conservancy.

OLD-GROWTH SPRUCE-FIR FOREST

Not all big-tree old-growth is cedar-hemlock. The main Duncan Valley once had abundant old, mid- to high-elevation Englemann spruce-subalpine fir (ESSF) forest with giant spruce trees. The trees were so valuable that logging companies logged them early on. As a result, the old-growth ESSF was almost completely wiped out. This example (right) in the Westfall Valley is very rare, but there may be others in the unlogged side valleys. Between clearcuts along the valley bottom and the ESSF at higher elevation, there is also a broad band of extensively intact Inland Temperate Rainforest in the Westfall Valley.



Gary Diers



Gary Diers

EAST CREEK RAINFOREST

Most Upper Duncan River tributaries are untracked wilderness with dense forest and nearly impenetrable vegetation. Very few people have been in some of these drainages, and two of them are the photographer Gary Diers and his partner Inanna. In East Creek they found an extensive tract of virgin Inland Temperate Rainforest that they compared to the primeval forest of the Incomappleux Valley. Unlike the Incomappleux, East Creek has never been logged, its ancient rainforest never studied for the species it supports.



Gary Diers

Giegrich Creek has sustained a fire since this photo was taken, extent unknown.

A MAJOR SOURCE OF CLIMATE CHANGE MITIGATION

The BC government’s Old-Growth Technical Advisory Committee identified a number of old-growth areas in East Creek that are high priority for logging deferrals, based on imminent risk of logging. The extensively intact ancient forest has survived this long because the opening of the valley is steep and rocky, therefore too expensive to build a logging road. But such conditions are surmountable when the price of wood is high. Giegrich Creek (left) was not in the Timber Harvesting Land Base due to steep slopes, but that, too, can change when the price of wood is high enough. What’s in Giegrich and East Creek should be treated as a world heritage and, with the huge size of the trees, a major source of mitigation for climate change.

Right - This photo of the main Duncan Valley shows traces of a road, an old fire, and possibly a clearcut, but it is one of the largest tracts of continuous forest approaching maturity in the southern Selkirks. Scientists advise that, to fight climate change, we must not only save our old forests, but also allow mature forests and younger forests to keep ogrowing.



A. Sherrod



Gary Diers

Left - East Creek penetrates the west side of the Purcell Mountains. It has its headwaters in glaciers just outside the boundary of Bugaboo Provincial Park. That park lies on the other side of the Howser Spire seen in the distance, and is world renowned for its spectacular climbing opportunities. However, the park is very small (13,646 hectares), and composed almost solely of subalpine forest, alpine meadows, rock and ice. The only major protected area in the Purcell Mountains, the Purcell Conservancy, while very large, is over 85% subalpine or higher.

East Creek, Giegrich Creek and possibly other tributaries on the east side of Duncan River would preserve the only examples of ancient forest, in the Purcell Range.

THE BADSHOT RANGE A KARST AND RAINFOREST ECOSYSTEM

Intact Temperate Rainforest in karst areas is globally rare and associated with growing big trees.

Between the Duncan and Lardeau Rivers rises the Badshot Range of the Selkirk Mountains. The subalpine and alpine scenery are marked by spectacular limestone rock formations distinctly different from other mountain peaks in the region, and there are other unusual geological features, including a cave. These features are characteristic of “karst” ecosystems in which the foundational rock is limestone that is easily dissolvable by rain. In combination with high amounts of rain, this means high nutrient levels in the soil, and high biodiversity.

A. Sherrod



Karst formation in Healy Creek alpine, Lardeau watershed.

Nutrient-rich soil atop a limestone rock foundation is considered a prime condition for growing big-tree old-growth forest. (Baichtal and Swanson, 1996). According to the BC Ministry of Forests (MOF) “Karst Management Handbook” (2003), these ecosystems: “are often characterized by large mature trees, diverse plant and animal communities, highly productive aquatic systems, well-developed underground drainage...”

They are sensitive to damage of underground hydrology,

and to soil and streams from erosion, and damage to cave entrances. Research in Alaska has indicated that karst can increase fish productivity by reducing the acidity of streams, encouraging more plants and insects that fish eat and other means; but if it is mistreated, it can also contaminate streams with silt or chemicals.

Karst Ecosystems have High Biodiversity

“Karst ecosystems” are home to an incredibly rich diversity of animals and plants, above and below ground, many of which occur nowhere else on the planet ... Owing to their steepness and relative inaccessibility, karst landscapes act as natural refuges for species that have disappeared elsewhere as a result of hunting and habitat loss.” (Phys.org, Jan. 22, 2021).

Karst Attracts International Visitors to BC Parks

The government website also says that BC karst ecosystems “attract recreationist and caving enthusiasts from around the world, and BC provincial parks with karst are very popular with visitors from around the world.” The government states that karst ecosystems are very sensitive to disturbance such as rock quarrying and logging, which can lead to excessive soil erosion and numerous other impacts. Karst ecosystems are endangered by mining for minerals involved in a wide range of industries.



Gary Diers

Can you see the man’s head peering out from between the trees. These giants are in Lake Creek in the Lardeau watershed, downstream from the Karst formations.



Craig Pettitt

“Limestone is soft and porous, so over the millennia water and weathering have carved the karstlands into wild towers resembling tyrannosaurus teeth. Caves, sinkholes, steep cliffs, and other dramatic formations are common ...The world’s largest caves and underground rivers are located in karstlands. The porous rock holds a lot of groundwater, streams and ponds, sometimes underground.” (MacDonald, “The Incredible Unsung Karst Ecosystem”, JSTOR)

Photo taken from within the park proposal looking across the boundary.

CAVE EXPLORATION IN THIS PARK PROPOSAL

In 2019 a team of climbers and cave explorers notified Valhalla Wilderness Society that they had discovered a massive 69 meters+ pit (below) and many smaller entrances, in VWS’s park proposal. There were antlers in the pit. The team mounted an expedition which deserves a whole separate report by the explorers. Photographs show the pit surrounded by a huge area of rocky ground bizarrely splintered into slabs and square chunks. One can easily see how water could be channelled underground. Currently road access to the Badshots alpine is closed to protect mountain caribou, and anyone wishing to visit the cave must be prepared for a long and steep uphill backpack through dense forest.



Douglas Noblet

BIODIVERSITY IN THE BADSHOTS

Fifteen years before VWS learned about the cave, or knew anything about karst, it commissioned a survey of lichens in the Duncan valley bottom. Our consultant found that one area had remarkable diversity of lichen species, including 16 coastal species, whereas other spots examined were poor in lichens. The poor areas were based on granite or schist, whereas the rich area had a limestone base and was, unbeknownst to us, downslope from the cave. On the other side of the mountain, a caribou biologist once noticed there was an elevational band across the slopes above the Lardeau River, that was particularly rich in hair lichens that the caribou eat, and wondered if that was why they kept coming even after logging occurred. This karst-rainforest ecosystem deserves further scientific study.



Douglas Noblet

The crevice in the ground was first spotted from the air.

AN ECOSYSTEM GAP IN BC'S PROTECTED AREAS

BC Auditor General, 2010

“We expected the system plan to be considering and ensuring viable representation of British Columbia’s biogeoclimatic zones, adequate land sizes and adequate connectivity between protected areas....Instead we found otherwise....it was apparent that the conservation of biodiversity will become more at risk in the future due to the inadequate connectivity of parks and protected areas.”

BC Auditor General, 2017

“There has been little effort to address the issue of connectivity for grizzly bears or to provide wildlife corridors and safe transition areas for those populations in the south that may have limited migration and may experience genetic inbreeding ... Government’s announcement in Nov. 2016 of its BC Parks Future Strategy does not include connectivity of the parks system.”

Loss of Old-Growth Is Loss of Connectivity

In southeastern BC loss of connectivity is mostly caused by any kind of development that entails forest removal, roads and human presence. Wildlife may be killed near clearcuts, roads, and human habitation, not only by predators but also by human hunters and through conflicts with people. As a result, some species of wildlife avoid clearcuts and roads. Confined in increasingly small patches of habitat, they do not have sufficient safety, food and mating opportunities.

BC’s loss of spotted owls on the coast, and of whole herds of mountain caribou in the interior, and its 2,000+ species at risk, expose the long-time systematic exclusion of low- and mid-elevation old-growth forest from parks. Until the Incomappleux Conservancy was protected in 2023, about 85.5% of the parks in the Selkirk and Purcell Mountains, was 1,400 meters or higher, meaning mostly alpine meadows, and rock and ice. The percentage is still major.

Obviously the protection of the Incomappleux was a big step forward, but mountain caribou disappeared from the Incomappleux Valley 15-20 years ago due to severe clearcutting at lower elevations in the lower valley. Unfortunately, the Conservancy boundaries cut off the Westfall Valley and its crucial link to the Duncan River. This is at a time when

caribou were recently declared extirpated from the adjacent Glacier National Park due to clearcutting just outside its boundaries. Caribou do use Goat Range Provincial Park, but more often they are seen outside the park.

Park Proposal Design Has Some Alpine

This park proposal was designed by Valhalla Wilderness Society’s expert team composed of Forest Technician Craig Pettitt, grizzly bear biologist Wayne McCrory, R.P.Bio., and biologist Amber Peters, R.P.Bio, with the collaboration of Baden Cross of Applied Conservation GIS. The boundaries are drawn to add more forest, especially old-growth forest, to our park system; but this proposal also contains 32,140 hectares of alpine tundra where necessary to achieve connectivity for wildlife safety and travel.

Our planning team is aware that many species, such as grizzly bears, mountain caribou and wolverines, need both low- and high-elevation habitat. Mountain goats need high elevation. In general, such habitat is not lacking in the Inland Rainforest Region or in our park system. However, the VWS team is aware that mountain lodges, ski resorts, heli-skiing and snowmobiles put these animals at risk.



Karl Gfroerer

Mountain caribou commonly descend from Goat Range Provincial Park in spring and autumn to cross the Lardeau River and climb to the high country of Healy and Lake Creeks within this park proposal. Although the herd is in severe danger of being totally wiped out, six of the surviving 25 were counted in the high country of Lake Creek in 2023. Right: Healy Creek alpine.



Craig Pettitt

ALPINE MEADOWS AND MOUNTAIN PEAKS ABOVE THE TREES



Gary Diers

Although rock and ice was largely excluded from the park proposal, the proposed boundary does reach subalpine or alpine elevation in the Westfall, Duncan and Howser Ridge drainages. From here it offers stunning views of the surrounding peaks. A trail from many drainages in this proposal could provide foot access to high mountain lakes, alpine meadows and views of the magnificent peaks.

Left: Glacier National Park viewed from subalpine meadows in the Duncan Valley.

Below: peaks of the Battle Range tower above the Westfall Valley.

Surprising Species at Risk in the Subalpine



Amber Peters



Gary Diers

WESTERN TOAD - A 10-year old study of Western Toad populations by VWS biologists Wayne McCrory, R.P.Bio and Amber Peters, R.P.Bio, has shown that there are healthy populations of Western Toads, a SARA Species of Concern, in the region surrounding this park proposal. The toads breed and hatch in valley-bottom lakes and wetlands, then climb into the surrounding forest where they spend their adulthood until they are ready to descend again and breed in their natal waters. Phenomenally, the tiny toadlets, the size of the end of one's little finger nail, climb all the way to the subalpine from the valley bottom, and this has been documented to occur within this park proposal.

PALE JUMPING-SLUG (*Hemphillia carmelus*) - This unusual slug has behaviour to ward off predators by writhing vigorously if disturbed. In BC it is found only in the southeastern part of the province and is associated with humid forest. This specimen was found by land snail ex-



A. Sherrard

perts working with VWS in 2011, when there had been only 7 occurrences documented in the Columbia Basin. It is a SARA Species of Concern usually found in mountain forest, and considered under high threat by logging. This one was found in the alpine of the Badshot Range, where it was likely nourished by the calcium in the karst ecosystem.

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