Conservation Values of the Proposed Selkirk Mountain Caribou Park

Jim Lawrence

Submission to the Governments of British Columbia and Canada

On the urgent need to fully protect the last remnants of rare Inland Temperate Rainforest in the Central Selkirk Mountains, including habitat for a herd of 90 endangered Mountain Caribou

March 2011

Valhalla Wilderness Society
Box 329, New Denver, British Columbia, Canada V0G 1S0
Phone: (250) 358-2333, Fax: (250) 358-7950, E-mail: vws@vws.org, Web: http://www.vws.org

CONTACT:

Craig Pettitt, VWS Director, 250-358-7997
Anne Sherrod, VWS Director, 250-358-2610

TABLE OF CONTENTS

THIS PARK PROPOSAL IS SUPPORTED BY:

Applied Ecological Stewardship Council of BC

Conservation Biology Center

Pacific Wild

Purcell Alliance for Wilderness

Raincoast Conservation

Save-the-Cedar League

Valhalla Wilderness Society

West Kootenay Ecosociety

Wilderness Committee

EXECUTIVE SUMMARY

This report proposes a 156,461-hectare, fully protected park that would provide connectivity between three existing parks in the central and north Selkirk Range of the Columbia Mountains of BC. The authors urge both the provincial and federal governments to protect it.

Mari Omori

Upper Incomappleux Valley - primeval, very wet Inland Temperate Rainforest.

This park proposal contains the last remnants of truly primeval, very wet Inland Temperate Rainforest known to exist south of the Robson Valley. One area, in the upper Incomappleux Valley, may have been growing uninterrupted since the last Ice Age, along a wild river with gorgeous ice-blue water.

In recent years scientists have discovered a previously unsuspected richness of biodiversity in these forests, beginning with hundreds of species of lichens, many previously found on only the coast, some never before known to science. Preliminary surveys indicate similar extraordinary diversity of macrofungi. Rare plants have been found. And this year new researchers will be arriving from the U.S.

This park proposal would provide full and permanent protection to habitat for the endangered mountain caribou of the Central Selkirks. It also contains the primary spawning grounds of the blue-listed bull trout of Kootenay Lake, as well as the second most important spawning and rearing stream for the bull trout of the Arrow Lakes Reservoir. It would protect core habitat for blue-listed grizzly bears and wolverines.

UPPER INCOMAPPLEUX VALLEY

- Would protect 27,364 hectares of intact wilderness contiguous to Glacier N.P., including 17 kilometres of upper Incomappleux River.
- Trees up to four metres in diameter, conservatively aged at 1,800 years old.
- Only 1,500 hectares is operable forest. Five approved cutblocks abandoned by Pope & Talbot; changed hands to Interfor.

OTHER INTACT ANCIENT RAINFOREST

- In the Duncan, Lardeau, and Westfall watersheds. See details on page 6.
- Includes several last remaining unroaded tributaries in the river systems.
- Intact areas in this park proposal remain after 50 years of clearcutting because they have been too remote, or steep, or had other issues making it unprofitable to log.

CENTRAL SELKIRK MOUNTAIN CARIBOU

- Relatively stable population of 85-90 animals since 2002, but at approximately half the numbers since 1996 and 1999.*
- This is the largest, and possibly the most viable, herd south of Wells Gray Provincial Park.
- About half of the park proposal is already “no-logging” Ungulate Winter Range for caribou, established with substantial consultation and agreement of timber industry.
- Ungulate Winter Range is not protected from mining, power projects, roads for same, tourist resorts, glading for ski development.
- This park proposal would upgrade 1/4 to 1/3 of the total Ungulate Winter Range created by the Mountain Caribou Recovery Plan to park status. The overall result would be a conservation complex of fully and partially protected lands.

CLIMATE CHANGE

- The old-growth forests in this park proposal are all dense, humid, high biomass forests containing huge carbon stores in their trees and ancient soils. Scientific studies indicate that, if they are logged, as much as 80% of the carbon would return to the atmosphere; whereas if they are preserved, carbon sequestration will continue.

---

*2010 Mountain Caribou Census found at:
http://a100.gov.bc.ca/pub/siwe/details.do?id=723

James Bergdahl

Glada McIntyre in the headwaters of the Duncan River.

About the Park Proposal

There has been a park proposal in the Central Selkirks since 1993. The first was proposed by the Applied Ecological Stewardship Council of BC (AESC) whose founder, Glada McIntyre, tried to save the Singing Forest in Howser Creek. In 1998 the Western Canada Wilderness Committee, in collaboration with the Purcell Alliance for Wilderness, proposed a large park called the Bugaboo Extension.

The Valhalla Wilderness Society (VWS) began mapping and researching this area in 1998, in collaboration with the groups above. The VWS proposal changed over the years due to a flow of information streaming from the scientific studies and GIS mapping we sponsored, as well as the Mountain Caribou recovery planning process.

This present proposal was designed by VWS director and forest technician Craig Pettitt and director and bear biologist Wayne McCrory, with the help of Gary Diers of the Purcell Alliance for Wilderness.

Funding was generously provided by the late Glen Davis, the McLean Foundation, and a number of public-spirited individuals who do not wish to be named.

The following scientists and technical experts, were in part commissioned by VWS, but donated hundreds of hours of work on state-of-the-art science and GIS mapping: mathematician Baden Cross of Applied Conservation GIS; lichen researcher Toby Spribille from Graz University in Austria. Dr. Lance Craighead of the Craighead Environmental Research Institute.

BC lichenologists Curtis Björk and Trevor Goward contributed unimaginable amounts of time. Mushroom specialist Dr. Oluna Ceska and Dr. Adolf Ceska, the former head of BC's Conservation Data Centre volunteered their services in the Incomappleux.

In 1998 Dr. James Bergdahl produced a report on bull trout in the Upper Columbia Basin for VWS. In 2009 Dr. Lee Harding, a former Environment Canada biologist, provided VWS with updated information on fish specific to the park proposal.

Eminent wildlife photographer Jim Lawrence donated the mountain caribou photographs in this report. Professional photographers Mari Omori and Allan Watson of Findhorn also contributed photographs. Gary Diers and his partner Inanna penetrated the untracked wilderness of the park proposal and brought back field information and photographs. Mushroom researcher Jason Hollinger donated his stunning photographs.

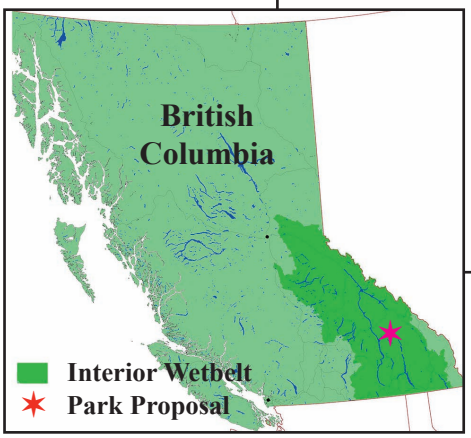
No one could have had access to the Incomappleux for the last several years without the heavy labour of a small crew of volunteers who collectively repaired the road after numerous washouts.

The Valhalla Wilderness Society deeply thanks all these people. We now turn this work over to the governments of BC and Canada, to be used to create a lasting legacy for the benefit of present and future generations.

Gary Diers

From the flat-topped summit at the centre of the mountains, to the right lies Glacier National Park. To the left of the summit lies the Selkirk Mountain Caribou Park Proposal. It includes some mountain passes for wildlife travel, but large areas of rock and ice have been excluded.

The proposed Selkirk Mountain Caribou Park is located in southeastern BC, in a region called the "Interior Wetbelt." The Interior Wetbelt has the world's only Inland Temperate Rainforest. The wetbelt is formed by the Columbia Mountains, and the park proposal is in the Central Selkirk Range of those mountains.



WHY DOES BC NEED MORE PARKS?

- The current level of protection in BC — 14% — has put many species on the road to extinction.
- The BC Conservation Data Centre lists 810 BC species as "red-listed" (most endangered) and 718 species as "blue-listed" (species of concern).
- Worldwide species extinction is now hundreds or thousands of times the natural rate because of human activities. Many scientists are warning that this threatens human health and survival. Other scientists are urging the protection of old-growth forest to reduce climate change.
- A survey of 3,808 species by Biodiversity BC showed that over 43% were of provincial conservation concern.
- For 86% of the BC's species at risk, the greatest threat is habitat loss.
- In a 2010 report BC's Auditor General said that our current park system does not adequately protect biodiversity because many parks are too small and lack connectivity.
- In 2001, a 17-member science panel funded by government, industry and environmental organizations said that at least 44% of the Great Bear Rainforest must be fully protected to maintain sensitive species such as grizzly bears.
- In 2003 the BC government and First Nations gave full protection to 28% of the Great Bear Rainforest; partial protection to another 5%, and the rest was to have an ecosystem-based management plan.
- A Conservation Area Design for the Inland Rainforest Region (equivalent to the Interior Wetbelt) by the Craighead Environmental Research Institute showed that 55% should be fully protected, and another 30% in conservation zones for biodiversity, to maintain the large carnivores, mountain caribou and salmon.

Why Does the Interior Wetbelt Need More Parks?

- The Inland Temperate Rainforest in this region exists nowhere else in the world. The very old forests, referred to by scientists as "antique" rainforest, are extremely rare and endangered. Only 10,014 hectares of this wettest old-growth rainforest is protected in parks and ecological reserves throughout the Interior Wetbelt. Another 51,457 hectares of the old-growth of the slightly less wet variety is in parks.

Craig Pettitt

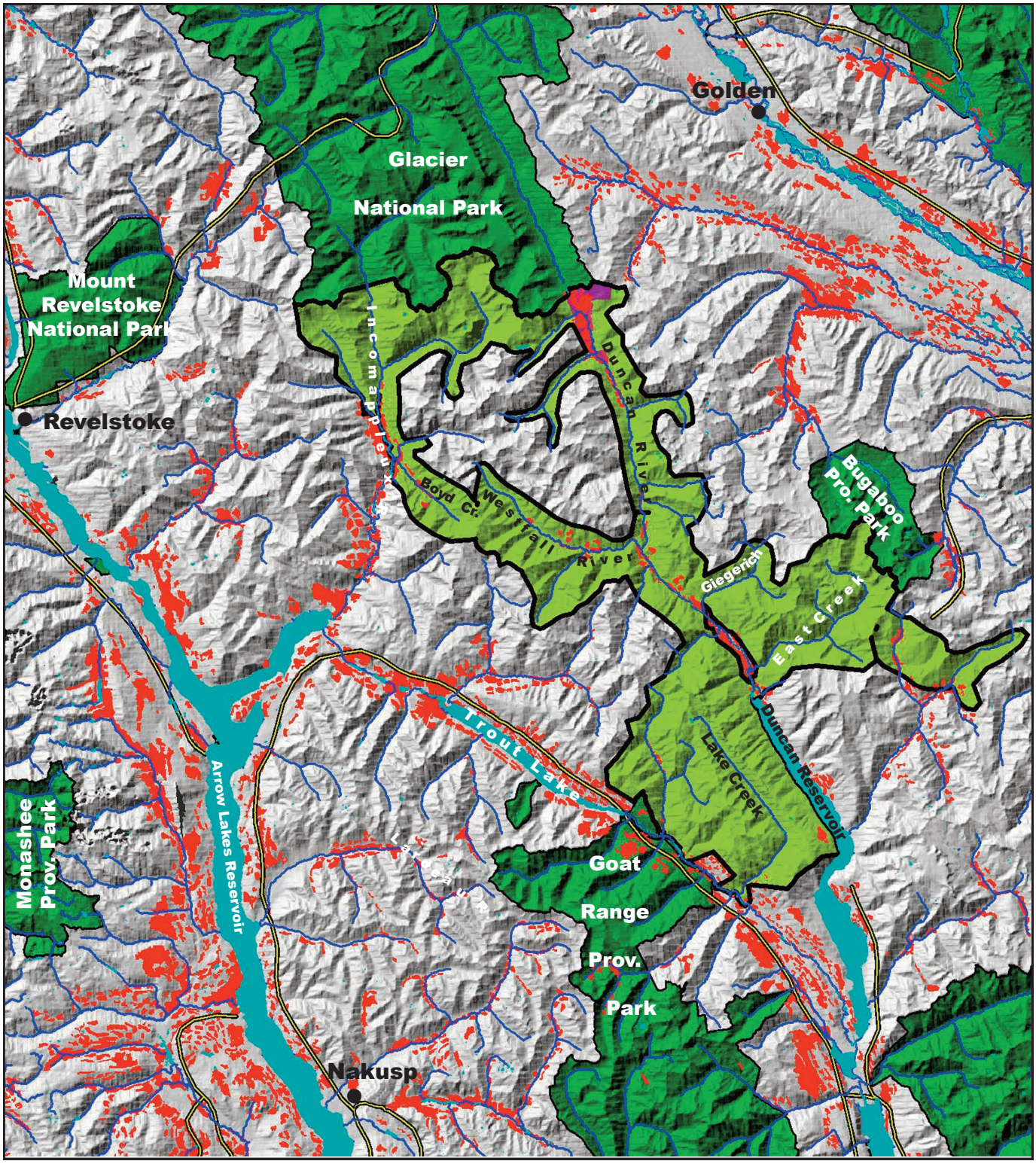
Primeval "very wet" Inland Temperate Rainforest in the upper Incomappleux Valley of the park proposal. This may be the only stand of its kind, for its age and size (hectares), remaining anywhere south of the Robson Valley.

- A 2001 study determined that there are 138 vascular plant and 43 vertebrate species listed as rare, threatened or endangered, plus 27 habitat types listed as rare, in BC's Inland Temperate Rainforest Region. (Not all of these are forest-dependent species or forest habitats.)" (Dr. James Bergdahl 2001)

Why Do We Need Another Park in the Selkirks?

- In the rugged mountains of this region, upwards of 80% of the protected areas is at high elevation. But by far many more species inhabit the lower elevations. Keeping the lower elevation forests out of parks is slowly wiping out species dependent on these forests.
- Inland Temperate Rainforest has amongst the highest biomass in the world, next to its coastal counterpart. This indicates very high carbon stores and sequestration capacity.

SELKIRK MOUNTAIN CARIBOU PARK PROPOSAL



Existing Parks

Proposed new park

Clearcuts

Lakes

Prepared by Baden Cross of
Applied Conservation GIS

Caribou UWR, Timber Harvesting Land Base, Clearcuts, Approved Clearcuts: Incomappleux, Duncan and Westfall Rivers

Existing Protected Areas

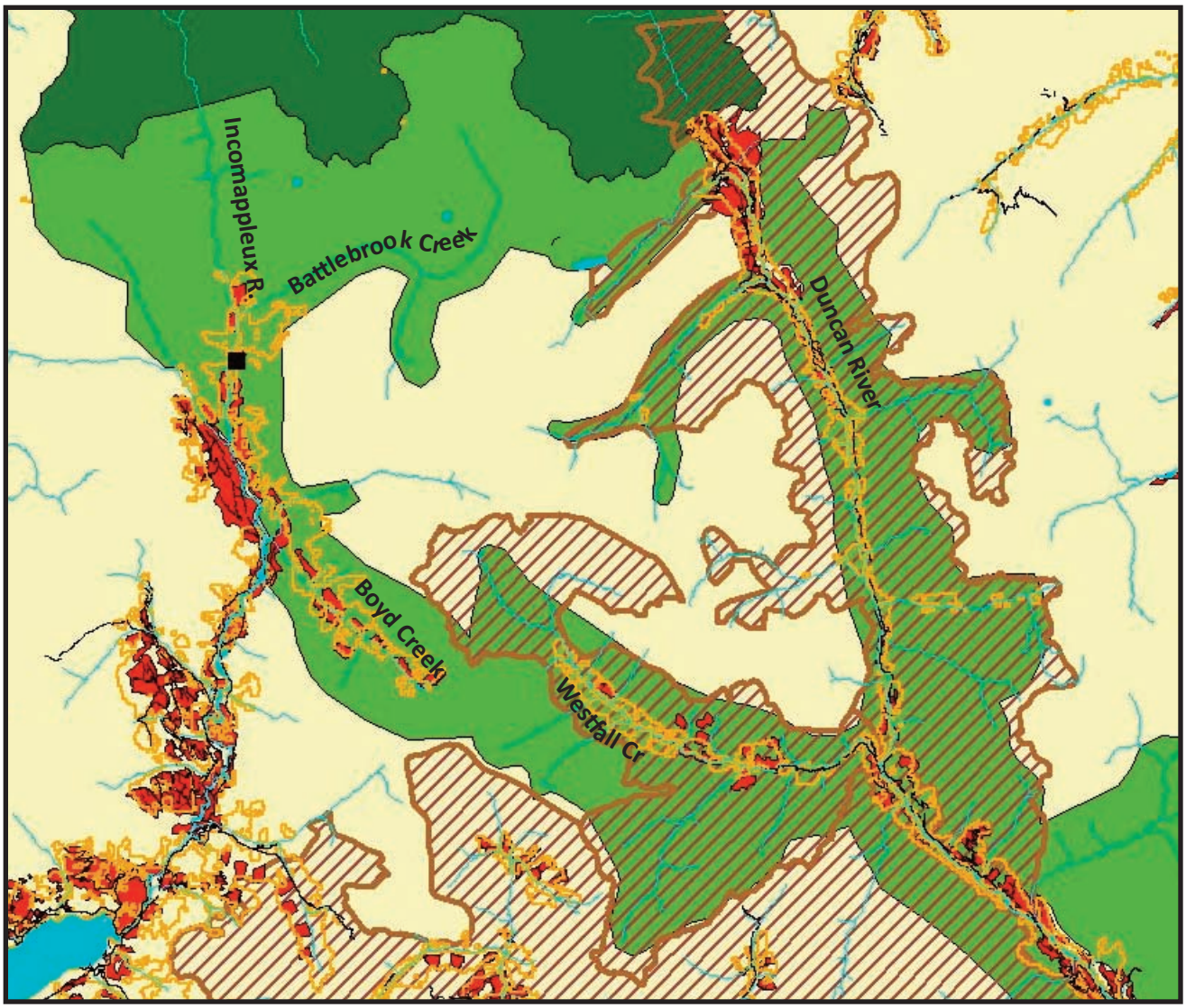
Proposed Park

Ungulate Winter Range (UWR) - No logging

UWR - Upgrade to Park

Timber Harvesting Land Base

Clearcuts and Approved CC



The Timber Harvesting Land Base is a very small part of the proposal, and it is mostly logged. The upper Incomappleux ancient forest contains only 1,500 hectares of commercial forest and it is extremely rare, primeval, very wet rainforest. There are five approved cutblocks in it. Upstream of that, there are steep slopes and avalanches paths.

There are extensive clearcuts that do not show up on the map at this scale, especially along the Duncan River and the Westfall Creek.

MOUNTAIN CARIBOU CRISIS

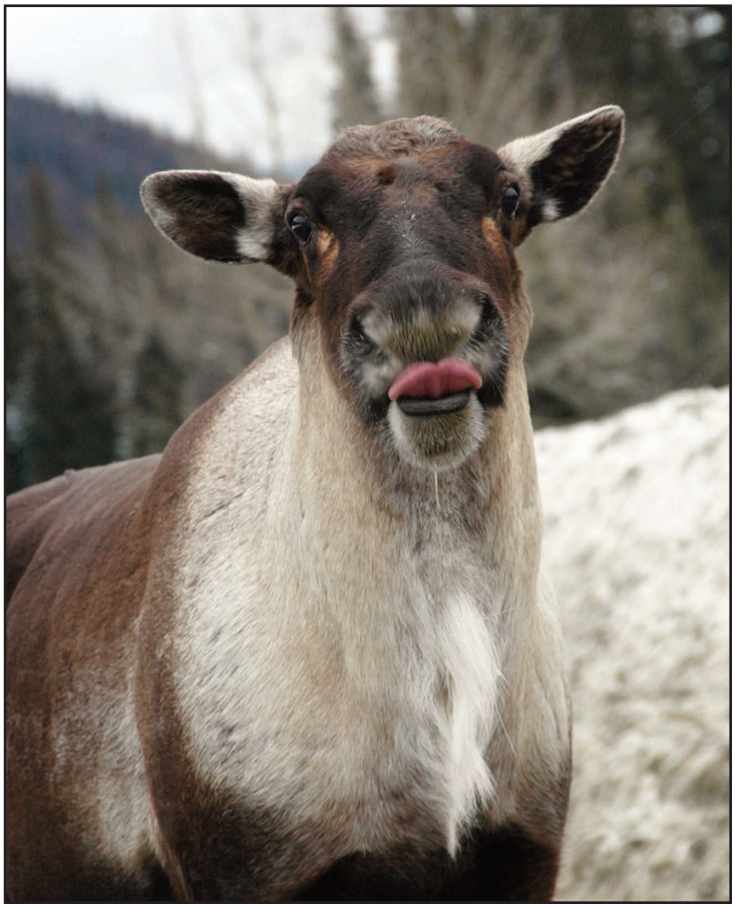
The Central Selkirks have the largest and most stable subpopulation of mountain caribou south of Wells Gray Park. The mountain caribou is the icon of many other species that are threatened because of destruction and fragmentation of old-growth forest after 50 years of clearcutting.

Other caribou herds have dwindled to the point where recovery is virtually impossible, or else they are experiencing a steep decline. The North Columbia herd has perhaps 70 animals. The South Columbia herd near Revelstoke had a population of 121 animals in 1994; it now has only eight, and their final disappearance is certain. There are only 46 in the South Selkirks and 15 in the South Purcells, where there is little unfragmented habitat left to protect. To the east, the Monashee herd is almost gone. These herds have litle habitat left to protect, it has been so heavily clearcut and fragmented.

The Central Selkirk mountain caribou herd was estimated at 211 in 1996. By 2002 it was down to 97. The estimate is now about 89-92 animals. It is more endangered than herds to the north in the Cariboo Mountains and Robson Valley, but less endangered than its immediate neighbours. And it has more habitat left to protect than its neighbors.

When we wipe out wildlife populations locally or regionally, we reduce the geographic range of the species as well as its genetic diversity. To let one mountain caribou herd wink out will influence the survival prospects for every other subpopulation in the whole Interior Wetbelt.

The idea that we can log part of the forest and leave some for the caribou has already been pushed to the limit where mountain caribou can survive. Scientists say that what is killing caribou is the advancing *fragmentation* of old-growth forest. Caribou need large, *intact* tracts of old-growth forest 140 years or older. Their survival strategy is to break up into small groups and scatter over a large area in dense forest so that predators can't find them. Smaller and more widely spaced tracts of intact forest expose them to predators. The goal of any planning to protect the caribou should be to preserve the remaining intactness. This park proposal was designed to do that. The recently created Ungulate Winter Range allows mining, hydro and tourism development, all of which would continue the fragmentation of existing habitat.



Jim Lawrence

Endangered Mountain Caribou: about 1,850 animals in existence.
Giant pandas in China: 1,900

ENDANGERED ECOSYSTEMS: ANTIQUE INLAND TEMPERATE RAINFOREST

"We suggest that the oldest old-growth rainforests of inland British Columbia ... represent one of the province's rarest and most endangered forest ecosystems."

Dr. Andre Arsenault and Curator Trevor Goward
on the ecological characteristics of BC's Inland Rainforests

"These stands are among the rarest, most threatened, and endangered ecosystems on the planet, and require highest global priority for protection."

Dr. Adolf Ceska
Retired head of BC's Conservation Data Centre
on the oldest stands of BC's Inland Rainforest

WHAT IS INLAND TEMPERATE RAINFOREST?

Craig Pettitt

Alan Watson

- Inland Temperate Rainforest occurs nowhere else in the world but in British Columbia's Interior Wetbelt.
- Inland Temperate Rainforest is a type of Interior Cedar-Hemlock (ICH) forest. ICH is the climax forest at low and/or middle elevations over much of the Interior Wetbelt.
- ICH is classified as dry, moist, wet or very wet. Many scientists consider only the "wet" (ICHwk) and "very wet" (ICH vk) to be rainforest. Only these types maintain enough moisture throughout the summer to host many rainforest species otherwise found only in coastal rainforest.
- Due to wetness these forests rarely burn. Therefore Inland Temperate Rainforest has huge trees that may be 500-2,000 years old. The forest itself may be thousands of years older than its oldest trees. Heavy loads of moss and lichens grow on the limbs and trunks of trees.
- The ICH extends across the BC-US border as far south as central Idaho. Some scientists refer to all ICH as Inland Temperate Rainforest. But today the huge Western Redcedars found in the northwest US occur only in small, isolated groves. These groves have lost most of their coastal lichens because they no longer remain cool and moist enough throughout the summer.
- Inland Temperate Rainforest hosts many coastal species that do not otherwise occur inland, but its ecology is unique. A large part of the precipitation falls as snow, and there are both coastal and boreal species.
- These wet ICH forests support hundreds of species of lichens — 283 lichen species have been identified in the Incomappleux Valley alone. Over the last 10 years lichen experts have found species of lichens new to science in these rainforests, and expect to find many more.

Alan Watson

Craig Pettitt

Photos all taken in the upper Incomappleux Valley

GAPS IN PROTECTION

Craig Pettitt

Craig Pettitt

Provincewide protection of Inland Rainforest

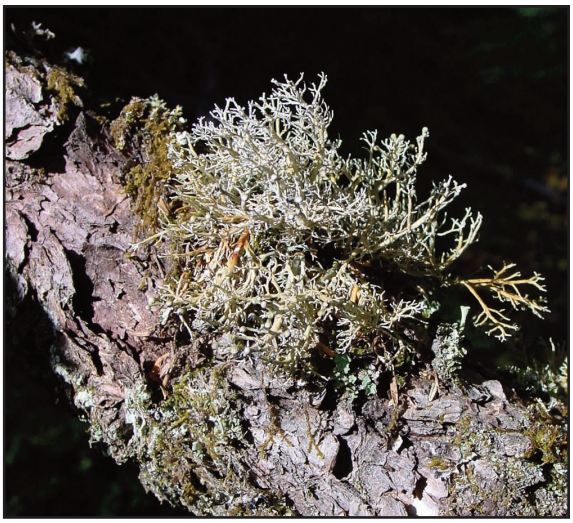
The Inland Rainforest Region (IRR) is the study area for the Valhalla Wilderness Society's 10-year GIS mapping project. It approximates the Interior Wetbelt and the historic range of the mountain caribou. It covers 14.3 million hectares. GIS analysis was carried out by Baden Cross of Applied Conservation GIS).

Craig Pettitt

- **Only 15% of forest in the IRR is Inland Rainforest.**
- **Only 18% of the Inland Rainforest is in parks.**
- **Only 20% of the Inland Rainforest in parks is old-growth.**
- **Only 51,457 hectares of ICHwk old-growth in fully protected areas.**
- **Only 10,014 hectares of ICHvk old-growth in fully protected areas.**

in parks and protected areas throughout the whole 14.3-million-hectare Inland Rainforest Region. Further analysis shows:

- **Old-growth is defined as 140 years or older. BC does not keep track of forests over 250 years old. So there is no way of telling how much very old Inland Rainforest is in parks.**
- **We do know that one-third of all protected Inland Rainforest is in one park: Wells Gray Provincial Park. However, the majority of this forest burned in the 1940s.**
- **47% of Inland Rainforest in parks and ecological reserves is on steep slopes 40% or over.**
- **Only 36% of the total protected Interior Cedar-Hemlock is 1,000 metres or less in elevation. That means that two-thirds of the ICH in parks and other fully protected areas is near or at the transition zone with subalpine forest.**



Craig Pettitt

This shows that the percentage of the land, or of the forest, that's protected tells us very little about the protection of species in these steep mountains. Mountain caribou do not favour slopes over 40%. Such steep slopes would exact a major toll on energy reserves for an animal whose food supply may be marginal. Scientific studies show that many more lichen species live in the ICH at 600 metres than at 1,000 metres. And 2,000 year-old old-growth will have far more lichen species than 140-year-old old-growth.

Wildlife Needs Cedar-Hemlock Forest

Wildlife Needs Cedar-Hemlock Forest

In winter the mountain caribou escape predators by living at high elevation in the deepest snow of winter. They live on hair lichens in the spruce-subalpine fir forest. But to survive on this diet, they go down the mountains in spring, to where the snow melts earlier and the first greens are available. Scientists believe this may be crucial to the ability of cows to give birth to live, healthy calves. The caribou must visit the lower elevations again in early winter, to wait for sufficient snowpack in the high country to support them so they can reach lichens high in the trees.

Like mountain caribou, the grizzly bears and wolverines are well adapted to cold weather at high elevations. But in some seasons, lower elevations are the only place or the best place to find food. For grizzly bears, this means early greens in spring, the summer's first berries, and kokanee salmon in fall.

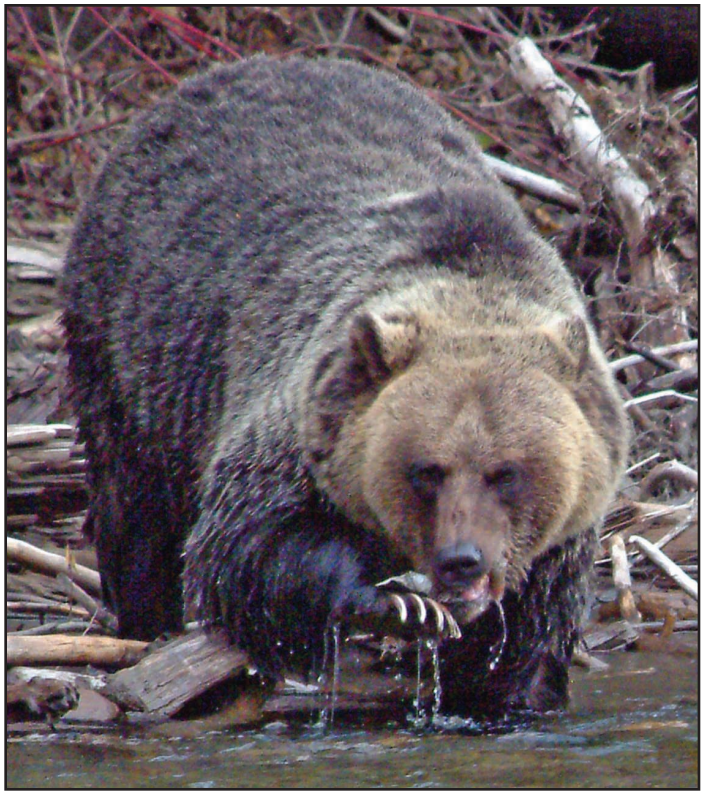
Some wolverines come down to the valley-bottom cedar-hemlock forest in winter. Scientists believe they may be scavenging for dead ungulates. Wolverines are under significant threat from commercial trapping, habitat loss and disturbances to winter birthing and rearing dens in the high country from heli-skiing and snowmobiling.

In late winter, female wolverines dig down into the snow in boulder fields or log piles and give birth to their young (natal dens). They then have to leave their young in similar denning areas called maternity dens and travel over broad areas to find carrion or other food. They are very sensitive to any type of disturbance and will try to move their young to a new area that is not disturbed.

Jim Lawrence

Core wolverine habitat is uncommon in the southern interior, but this park proposal has a large block of it. This photograph was taken near the Lardeau River.

The Interior Wetbelt of BC has 98% of the world's mountain caribou. They use all elevations of their range. They are dependent upon large tracts of intact old-growth forest 140 years or older. GIS maps show that the overwhelming majority of logging in the Central Selkirks has been in the cedar-hemlock zone. This is the spring and early winter habitat of the mountain caribou, and is also used by grizzly bears and wolver-



Craig Pettitt

One of the ways that rivers and cedar-hemlock forest are critical to wildlife of the Central Selkirk Mountains: a prehibernation meal of fish.

Park Proposal Rivers Critical For Bull Trout Populations

Rivers in the Central and North Selkirks have almost no protection. Glacier National Park includes about 18 kilometres of the uppermost Incomappleux River where massive avalanches keep the valley swept free of trees. About 15 kilometres of the Lardeau River, with mostly very small second-growth forest, are in the Goat Range Park.

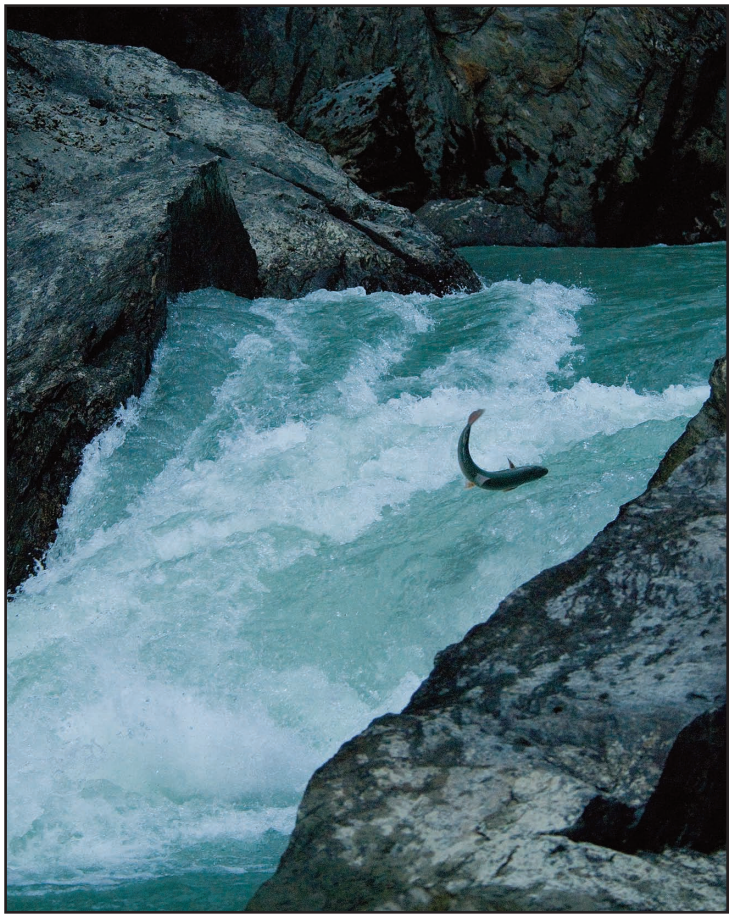
Fishing in the huge, fjord-like Kootenay Lake and the Arrow Lakes Reservoir is a major tourist attraction and source of income in the Kootenays. The lakes are not in the park proposal, but the resident rainbow trout, bull trout and kokanee salmon need moving, well-aerated water to lay their eggs. This occurs in creeks and rivers within the park proposal.

In the U.S. bull trout are classified as endangered ("red-listed"). In BC they are blue-listed. They need very cold spawning waters within a narrow temperature range, often near springs that feed very cold water into the creeks and rivers.

A study conducted in 1996 showed that ther primary spawning sites of bull trout in Kootenay Lake were the Westfall River, Houston Creek, and upper mainstem of the Duncan River (O'Brien 2001) — all within this park proposal.

Another study found that there are only five tributary watersheds of the Arrow Lakes that have relatively abundant juvenile bull trout (Decker and Hagen 2007). The Incomappleux watershed is the second most important of these streams for bull trout spawning and rearing areas. It had 26% of the juvenile bull trout counted in tributaries to the ALR . Most bull trout spawning is in the river bed, in the last 11.6 kilometres of accessible length — within the park proposal.

Researchers have caught or sighted bull trout in or at the mouth of Pool, Lexington, Boyd, Kellie, and Bullard tributaries of the Incomappleux. But logging has wrecked the outlets of some of these creeks, which may be why the fish spawn in the mainstem of the river.



Craig Pettitt

Bull trout hurl themselves up the Incomappleux River. Their competitors, rainbow trout, cannot make it. This makes the Incomappleux especially important to bull trout. They also favour the opaque water that comes from glaciers (Decker and Hagen 2007). This may help to keep the water temperature cold and stable. There are few rivers like this left that have not been wrecked by power plants and logging. For the bull trout, it is crucial to keep the Incomappleux River free of any further development.

Craig Pettitt

Right: The Incomappleux, Duncan and Lardeau rivers host runs of kokanee, a small, landlocked sockeye salmon. They are the chief food for large trout. After spawning they die and fertilize the entire river and lake systems, as well as the forests through the droppings of animals such as bears. The Lardeau River has the largest kokanee spawning migration in the Columbia Basin.

How Much Destruction is Enough?

Lee Harding

Craig Pettitt

Mark Gronvall

Top photo, left: The Incomappleux Valley before it was so ruthlessly butchered. Bottom photo: Two-thirds of the length of the Incomappleux have been clearcut. Loggers say that some of the trees were so big that only one could be loaded on a truck. The snow reveals roads and clearcuts. The forested slope on the right is too steep to economically log. The upper portion beginning with the mountain in the background is splendidly intact. Due to rugged terrain only about 1,500 hectares is loggable.

Is it too much to ask that the people of BC could have 1,500 hectares of operable 2,000-year-old rainforest to keep this remnant intact, as a memorial to the vast amount of similar forest that has been destroyed, and as a legacy for future generations?

In the Central and North Selkirks, vast drainages of globally rare, ancient Inland Temperate Rainforest have been wiped out by clearcutting. A sister valley to the Incomappleux, the Akolkolex River Valley, which also had ancient ICHvk, has had almost all loggable forest wiped out with huge clearcuts. The Halfway and Lardeau rivers, and Kuskanax Creek, have had most of their valley bottoms and low- to mid-elevation slopes stripped.

Two-thirds of the length of the Incomappleux, most of the Duncan and much of the Westfall valleys have been reduced to stumps.

The Monashee Range to the west has had its prime ICHvk reduced to a few strips along creeks. They are now museum pieces, gravestones of the functioning ecosystems that once were. The entire Interior Wetbelt south of this park proposal is even *worse* in terms of the fragmentation outside of a few parks.

Clearcuts in the Park Proposal

There is increasing scientific recognition of the importance of recovering connectivity on logged areas between core wildlife habitats. In particular, the massive clearcutting in this park proposal includes the very wettest kind of Inland Temperate Rainforest along the Incomappleux River, with about 1,000 hectares of old-growth adjoining a very major wetland with red- and blue-listed species.

A critical wildlife travel corridor between the Duncan River and the Beaver Valley in Glacier National Park was also massively clearcut.

Due to the value of these areas in terms of biodiversity, over 3,000 hectares of clearcuts have been included in this park proposal. This has allowed the inclusion of rivers in the park proposal which still function as critical connective corridors. We have called these heavily clearcut areas "recovery linkage zones."

Existing Protected Areas in the Central and North Selkirks

"Parks and protected areas are not adequately connected to other protected areas ... From recent scientific research we reviewed, 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, 2010 report on BC parks

ELEVATION AND BIODIVERSITY

In the Central Selkirks, higher elevations in these mountains are cold and covered by snow much of the year. Vegetation is sparse and fragile. By far the highest biodiversity is found at lower elevations, in the cedar-hemlock forest.

Cedar-hemlock transists to the subalpine forest — Engelmann Spruce-Subalpine Fir (ESSF) — at approximately 1,400 metres. As ESSF approaches the alpine, it becomes "ESSF Parkland." Much of the Parkland is not forest at all, but clumps of trees scattered in subalpine meadows.

The Goat Range and Glacier parks have no habitat lower than 800 metres. But the Selkirk Mountain Caribou Park Proposal goes as low as 600 metres. Sampling of lichens by scientists shows that there is a large difference in the lichen diversity between 600 and 800 metres (pers. comm., Toby Spribille and Trevor Goward.)

BUGABOO PROVINCIAL PARK is a small park that is largely rock, ice and alpine meadows.

GLACIER NATIONAL PARK was created in 1900. It consists mostly of spectacular peaks, massive glaciers, and alpine meadows. About 80% of the park is 1,400 metres or higher. Nevertheless, it protects 26,000 hectares of Inland Rainforest, especially in the wildlife-rich Beaver Valley.

GOAT RANGE PROVINCIAL PARK - In 1994, the BC government created the Goat Range Provincial Park. About 78% of the park is 1,400 m or higher. The park does protect 10,100 hectares of Inland Temperate Rainforest (ICH wk), including the most southerly valleys with large, intact stands of ICHwk in existence.

Biogeoclimatic zones of the four closest parks to this park proposal — Glacier National Park, Goat Range and Bugaboo provincial parks and the Purcell Wilderness Conservancy:

85.5% ESSF forest or higher;

21.35% ESSF Parkland;

15% tundra (mostly treeless)

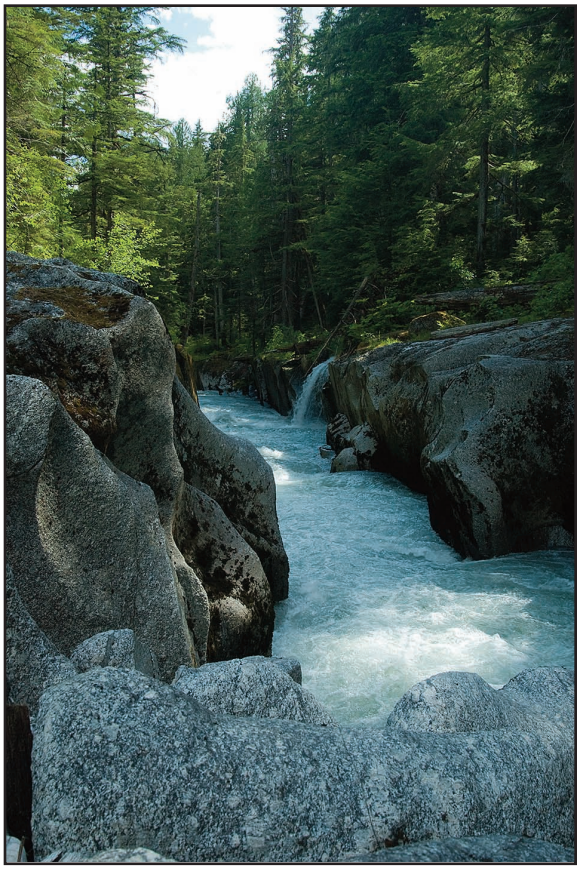
12.2% ICH

6.15% wet and very wet ICH (rainforest)

A breakdown of these figures can be found in the Appendix.

Craig Pettitt

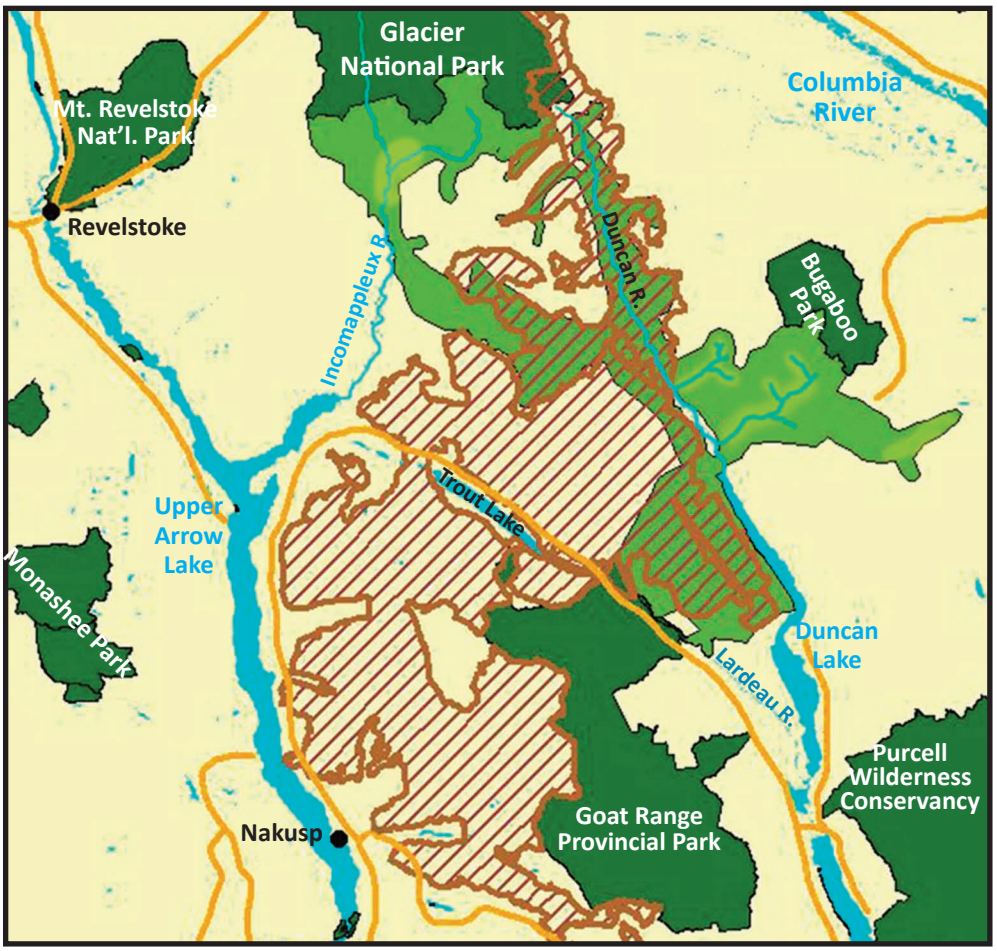
Secret heart of the rainforest: a totally intact tributary of the Incomappleux River, Battlebrook, rushes to its confluence with the river at 650 metres within the Selkirk Mountain Caribou Park Proposal.



Craig Pettitt

A Conservation Complex for the Central Selkirks

Ungulate Winter Range and the Selkirk Caribou Park Proposal



As part of its Mountain Caribou Recovery Plan, in 2009 the BC Government designated 197,126 hectares of the Central Selkirks as Ungulate Winter Range (UWR). The brown slashing is UWR. Only 16,676 hectares, or 8.4% of it, is Timber Harvesting Land Base with a ban on further logging. The rest is high elevation, steep slopes, burns, some heavily clearcut areas, and 3,000 hectares where modified harvesting can still take place.

Where the brown slashing and the proposed park overlap, the Ungulate Winter Range would be upgraded to park status.About half of the park proposal is UWR. It is important to keep all of the brown-slashed area, which is crucial to caribou. This conservation complex would be similar to the Great Bear Rainforest — a combination of fully and partially protected land, but quite a bit smaller.

Existing Protected Areas
Proposed New Park
Ungulate Winter Range
UWR - Upgrade to Park

WHAT'S WRONG WITH THE MOUNTAIN CARIBOU PLAN?

The important Central Selkirk herd was fortunate to receive a disproportionate share of the Timber Harvesting Land Base to be protected. As a result, habitat protection took a significant step forward in the Central Selkirk Planning Unit, but the following problems require another step:

THE PROTECTION IS NOT COMPLETE

The Ungulate Winter Range (UWR) does not protect against mining, hydro, or tourism development. It would not protect the caribou from a mega-tourism development such as the Jumbo Resort, nor from a new or reopened mining exploration road, nor from the devastating impacts of a mine. It would not protect them from huge clearcuts to run hydro lines from Independent Power Projects (IPPs).

THE PROTECTION IS WEAK

The protection can be removed and put somewhere else at any time, and in some planning units outside the Central Selkirks, it already has been! The Government Action Regulations in the Central Selkirks contain at least 10 exceptions under which some logging and road building can occur in the UWR. And if that isn't enough, companies can apply for an exemption from the rules and get a decision within 14 days! While many of these provisions are about allowing logging and road building around the edges of the caribou zones, that only furthers the fragmentation that is killing caribou: death by a thousand cuts.

THE PROTECTION IS NOT PERMANENT

The government promised the logging companies that if the caribou fail to increase, the caribou zones would be reconsidered. The principle of protecting species at risk is that, if the species fails to survive, at least the destruction of habitat has been reduced so that other species may be saved. This is not the case with this plan.

The good thing about the Ungulate Winter Range is that there has never before been any policy or law that says when logging should stop in a valley. That's how rivers like the Akolkolex and the lower Incomappleux were "nuked". The UWR has now stopped logging in some of these valleys at a point where there are still fish in the streams and many other species of wildlife. The potential removal of pro-

What's Wrong with the Mountain Caribou Plan? (continued)

tection if the mountain caribou fail to increase would take us back to zero in these valleys.

IMPORTANT CARIBOU HABITAT OMITTED FROM PROTECTION

The small amount of Timber Harvesting Land Base chosen for "protection" contains some extensive clearcuts and burns that are unusable for mountain caribou. Meanwhile, crucial valley-bottom, old-growth cedar-hemlock forest in Lake Creek, Duncan Lake and the Lardeau River valleys was excluded. These forests may be critical spring and early winter habitat for caribou.

THE UWR IS SINGLE-SPECIES PROTECTION

Other conservation values besides caribou were not even considered in the planning process. There was no stock taken of what other species might be at risk. Our oldest and rarest forests, containing countless numbers of small species, were not considered for protection. At a time when independent power projects pose a severe threat to fish, there was no stock taken of fish streams. Many of these streams have already had impacts from moderate to heavy logging.

Craig Pettitt

The Ungulate Winter Range (UWR) is very rich in trout streams. The fish shown above are Gerrard rainbow trout that grow to gigantic size. Their only spawning site is the Lardeau River and is protected by the Goat Range Park. This proposal would add protection to a small piece of shoreline, as well as to the Healy, Hope and Lake watersheds feeding the river along their travel route.

Government records for Healy and Lake Creeks show bull trout, rainbow trout, kokanee, mountain whitefish, and an unidentified sculpin. The longnose dace has been recorded in Lake Creek.

Bull trout are found in all the rivers in the park prosposal, and can spawn in surprisingly small streams. In the UWR outside our park proposal, bull trout have been recorded in the Halfway River, St. Leon, Kuskanax, Asher, and Wilkie creeks.

The Duncan River has bull trout, rainbow trout, mountain whitefish, slimy sculpin, unidentified chub and white sturgeon. The Howser, East, Westfall, and Houston tributaries have bull trout.

Gary Diers

Jim Lawrence

Left: Old-growth cedar-hemlock forest in the Lake Creek valley, where mountain caribou still persist. The Ungulate Winter Range designated by the Mountain Caribou Recovery Plan excluded this forest from protection.

Wayne McCrory-Toby Spribille

View of the Lardeau Valley from the high ridges of the Badshot Range.

Badshot Range: Healy Creek — Hope Creek — Hall Creek —Lake Creek

The Badshot Range divides the Lardeau and Duncan Rivers. This is the most important mountain caribou habitat in the park proposal. The 2010 government caribou census found up to 27 caribou or caribou tracks within or near the boundary of this part of the park proposal — about one-third of the Central Selkirk herd.

Thirteen of the caribou counted in late winter 2010 were in the Healy Creek drainage. The alpine of Healy Creek connects to a system of ridges and passes that give access to Lake Creek, Hall Creek and the Duncan River. Cedar-hemlock at lower elevations in these valleys likely contain critical spring and early winter habitat for these animals.

Jim Lawrence

At risk of disappearing forever: mountain caribou

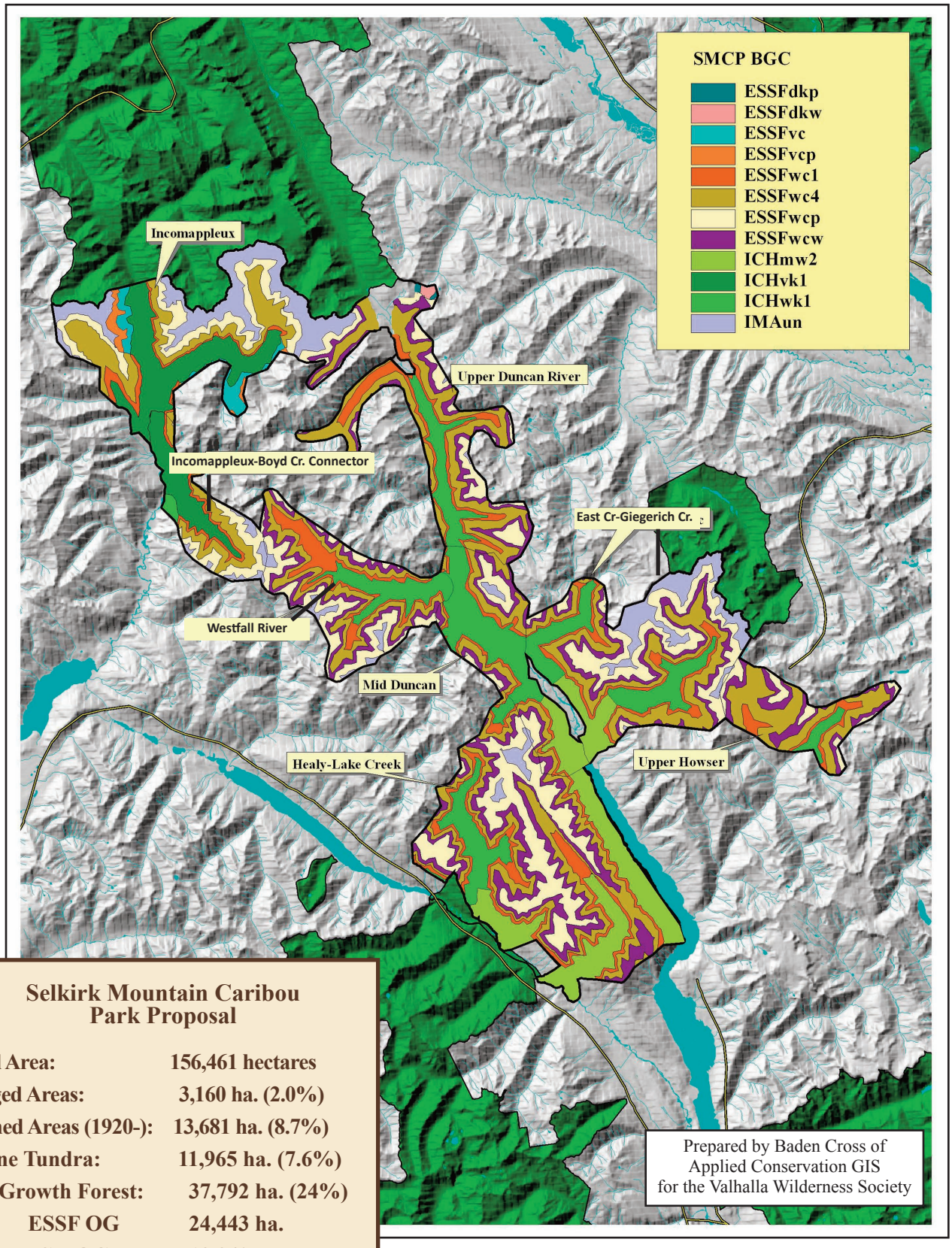
In designing the park proposal, VWS recognized that Ungulate Winter Range (UWR) west of the Goat Range park has the highest levels of use during late winter. It's clearly the more gentle slopes and hemlock-leading forest that attract them. But a significant area of it burned during the first summer it was designated — one of a number of reasons why caribou need to travel widely through the year, and also change their range over years.

Historically the caribou travelled from these areas, east through the Goat Range Park. They swam the Lardeau River and entered the park proposal, ascending the Badshots through the Healy Creek and perhaps through Lake Creek valleys. Descending to the Duncan and crossing the river, they had good habitat in the Hume Creek valley.

Every year caribou and their tracks are still seen in this area between the Lardeau and the Duncan. Their use of the Duncan River side has drastically dwindled, but continuing access from the Lardeau to Hume and other creeks such as Giegerich and the Westfall is important. The Central Selkirk herd is now the largest and most stable herd south of Wells Gray Park. Letting it's habitat and connectivity continue to shrink would doom it to extinction.

This part of the proposal would also protect superb streamside habitat in Lake Creek, with stands of magnificent old-growth cedar-hemlock. The Mountain Caribou Recovery Plan excluded this forest, presmably for logging. No one knows the significance of this old-growth to Mountain Caribou today, because the valley is untracked wilderness and the forest conceals the animals from the air. But caribou tracks were seen there in summer a couple of years ago. There is no excuse for logging Lake Creek, and at any rate, it has not yet been economical to do so.

BIOGEOCLIMATIC ZONES OF THE SELKIRK MOUNTAIN CARIBOU PARK PROPOSAL



Selkirk Mountain Caribou Park Proposal

Total Area:	**156,461 hectares**
Logged Areas:	**3,160 ha. (2.0%)**
Burned Areas (1920-):	**13,681 ha. (8.7%)**
Alpine Tundra:	**11,965 ha. (7.6%)**
Old-Growth Forest:	**37,792 ha. (24%)**
ESSF OG	**24,443 ha.**
ICH OG	**13,349 ha.**

ESSF = Englemann Spruce-Subalpine Fir
ICH = Interior Cedar-Hemlock (Inland Temp. Rf.)

THE PARK PROPOSAL: UPPER INCOMAPPLEUX/BATTLEBROOK

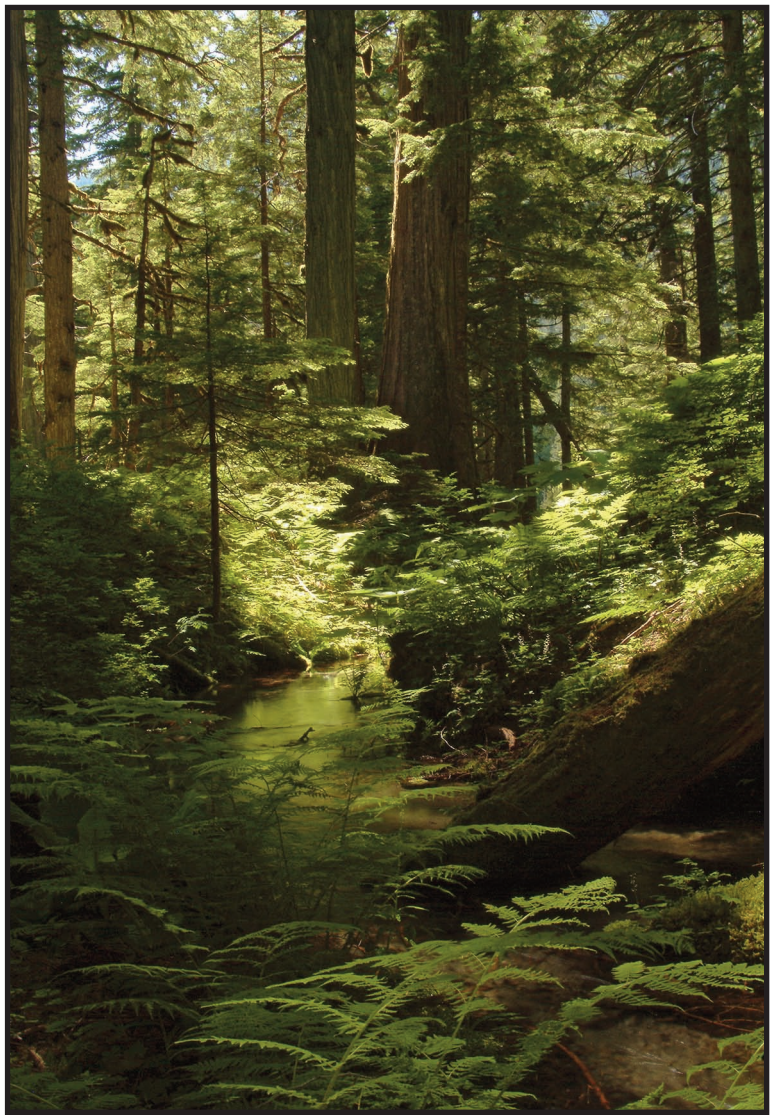
This is extremely rare primeval rainforest. Scientists say the forest may have been growing uninterrupted since the last Ice Age. There are many two- to three-metre diameter trees in the 800-1,500 year range. The oldest range up to four metres and an estimated 1,800 years old.

The forest is more rare because it is contiguous with Glacier National Park, making it part of a large, intact, wild ecosystem. The operable forest here is very limited, being contained between the clearcuts downriver and a steep-walled canyon with massive avalanche tracks upriver. Only about 1,500 hectares of the big trees are within the timber industry "operability line." Yet the visitor can walk amongst these awe-inspiring trees all day long and not come to the end of them.

The logging company that had the Tree Farm Licence, Pope & Talbot, went bankrupt, leaving five approved cutblocks within the big trees. The cutting licence has been transferred to Interfor. Some years ago a huge rockfall on the Incomappleux Canyon road damaged a bridge. The expense of repairing it has protected the trees ever since, but the trees could legally be logged at any time if market prices rise sufficiently to make it profitable for Interfor. This would shatter the intact nature of the forest.

There is also an application for a private power development 10 kilometres above the confluence of the Incomappleux River and Battlebrook. This would require pushing a road nearly to the boundary of Glacier National Park, totally destroying the intactness. Additional power development applications exist on McDougal, Kellie, Pool and Boyd creeks — enough to devastate the bull trout that spawn in the river and tributaries.

This forest could be preserved for future generations of British Columbians by foregoing a mere 1,500 hectares of logging. If instead it is logged or developed for private power, no one will ever see the likes of this forest again.



Craig Pettitt

"Forests of the calibre of the upper Incomappleux are in a class of their own, owing both to their great age, which has allowed thousands of years of colonization for rainforest-dependent species, and their structural complexity – the interactions of the hundreds of plants and fungal species with thousands of poorly known invertebrate organisms.

"The fragmentation of this forest would represent a direct and immediate threat to many species whose distribution is limited to short distances, and for whom a clearcut represents an immense migration barrier. Fragmentation would create canopy gaps allowing valley winds to penetrate into the heart of forest canopies that have been sheltered and humid for over a thousand years, drying out the habitats of species, such as the COSEWIC-listed Species of Concern *Nephroma occultum*, whose existence depends on very stable humidity and constant, undisturbed conditions.

Lichenologist Toby Spribille
University of Graz, Austria

Scientific Research in the Incomappleux

Juscha Grunther

Lichenologists Toby Spribille and Curtis Björk.

Craig Pettitt

Lobaria retigera (Smoker's Lung Lichen)

Inland temperate rainforest puts BC amongst areas around the world yielding species new to science.

Forests as far north as British Columbia do not have anything like the biodiversity of tropical forests. Many kinds of species become more numerous the further south one travels. But lichen species become more numerous moving north, well into Alaska. Lichens are one of the great pools of diversity in northern forests, but in the past they have been poorly studied. Only recently have scientists discovered totally unexpected explosions of lichen diversity, and this began in the Inland Temperate Rainforest.

283 species of lichens in the Incomappleux Valley, mostly in this park proposal.

That's more lichen species than all the other plant species found in the Incomappleux put together. The pioneering lichen surveys in the Incomappleux were carried out by Toby Spribille, a researcher from the University of Graz, Austria, and BC lichenologist Curtis Björk, in consultation with Trevor Goward, former curator of the UBC lichen collection. These findings revolutionized the knowledge of biodiversity in northern coniferous forests.

Of the 283 species found in the Incomappleux Valley, about 74% were found in the old-growth rainforest. A large number of them were "oceanic lichens" — usually found only near the coast. The oceanic lichens can live in the interior only where there are very wet conditions. The lichens of the Incomappleux include:

- 3 species not previously known in BC or Canada;
- 3 species not previously known in North America.
- 7 species new to science.

These lichens were found with only a cursory examination of a few areas. According to Spribille, "We are definitely looking at a major center of lichen diversity at a global level that we haven't even begun to fathom or explain."

Six-nation team identified species new to science

To determine whether the unidentifiable species were, in fact, new species, a team of eight experts from six countries worked together, using DNA analysis. Four of the new species have been named and published (Spribille et al., *The Bryologist,* bryo-112-01-08.3d). A fifth is due for publication soon. One species — *Myochroidea minutula* — has never been found *anywhere* else in the world but in the ancient forest of the Incomappleux.

In 2010 Spribille led a research group to Mt. McKinley National Park in Alaska. A thorough search yielded 766 species of lichens in a small area. Statistical analysis indicates there may be as many as 1,000. It is believed to be likely that a thorough search of the Incomappleux would yield many more species of lichens, some new to science.

Research expanding to other species

Research in the Incomappleux is expanding to other species. Mushroom expert Dr. Oluna Ceska has found rare coastal mushrooms, and Dr. Adolf Ceska, formerly of the BC Conservation Data Centre, has found rare plants. More researchers focused on other species will be arriving soon. The Columbia Basin Fish and Wildlife Compensation Fund has sponsored several fisheries studies in the park proposal.

Toby Spribille

New to science: *Gyalecaria diluta*

Anne Sherrod

Genus *Peltigera*

Craig Petitt

Coral Lichen

Craig Petitt

Alectoria and *Bryoria* hair lichens.

Lichens: Major Ecosystem Functions in Temperate Rainforest

The *Peltigera* on the right at top is one of many nitrogen-fixing lichen species. Researchers have reported up to 50% of the nitrogen input to Pacific Northwest forests coming from lichens. They draw nitrogen from the air and convert it to a form that plants and trees can use. Rain leaches the nitrogen into the ground; in addition, lichens fall from trees and decompose into the ground, fertilizing it with nitrogen.

The *Alectoria* and *Bryoria* hair lichens (bottom, far right) are almost the sole food of mountain caribou in the winter, and a major food in the summer. Every single species is important to save because we do not know what they do. Amongst hundreds of species of lichens, only these two hair lichen species form the majority of the mountain caribou diet. These lichens were also a favourite food of the interior Salish people. Lichens have associations with a large number of animals as food and nesting material. They also help to break down rock and create soil.

Many small species around the world are now being recognized as holding the biochemical keys to treating diseases and solving many other serious problems. And in many cases they are the *only* species that hold these keys. So the loss of even one species is considered by scientists to be a very great loss to humanity in medical research alone.

The *Lobaria pulmonaria* shown on page 12 was traditionally believed to be effective against tuberculosis. Studies have verified this belief. Scientists have been experimenting with lichens for decades, seeking valuable chemicals. And many of them are being used in commercial products today. Lichens have been found to have anti-tumour or antibiotic properties, as well as effectiveness against HIV.

Lichen species produce myriad chemical compounds and there is very little information on their function in the ecosystem. They hold profound secrets that are for future generations to discover, and some of them will undoubtedly be of immense value.

Toby Spribille

Spilonemella americana

Toby Spribille

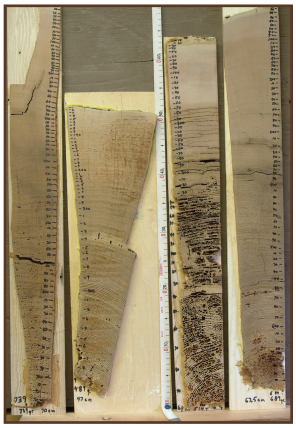
Pilophorus acicularis

The Incomappleux Reveals Ancient Forest Legacies

In the Incomappleux, stable growing conditions over thousands of years have allowed time for some of the most fragile small species, including many that need coastal conditions, to establish colonies. Time has enabled the creation of a precious legacy of ancient soil enriched with millions of microscopic organisms, and undisturbed root systems with invisible filaments from organisms, all interconnecting to hasten the process of decay and the transport of nutrients to support continuous rebirth. In the Incomappleux, lichenologist Toby Spribille found the Mountain Moonwort shown below, a primitive fern that goes back to the melting of the glaciers and is found only in ancient cedar-hemlock forest.

Mari Omori

Craig Pettitt



HOW OLD IS A 3.25-METRE (10 FEET) THICK TREE?

The oldest cedar documented in the Incomappleux is 3.25 metres diameter. The age of ancient cedars cannot be determined precisely because the natural life cycle of the tree includes rotting in the core, resulting in a hollow centre. Counting tree rings from solid stumps of mature trees, Valhalla Wilderness Society director Craig Pettitt found the following ages from the tree rings in the cross-sections shown in the photo above, centre:

Ages from left to right

- **739 years from a 1.5 m log = 492 years/metre**
- **489 years from a 1 m log = 489 years/metre**
- **514 years from a 1.3 m stump = 395 years/metre**
- **689 years from a 1.3 m stump = 530 years/metre**

Assuming similar growth rates throughout the tree's lifetime, a three-metre tree might be 1,300-2,200 years old, average 1,750 years. BC's Ministry of Forests says 800 years old. That means the 3-metre tree would have had to put on approximately two metres more than these trees in about 60-300 years, or a phenomenal 1 centimetre of diameter per year over their entire lifespan. The U.S. Forest Service in Idaho calculated its similarly huge cedar trees at 1,800 years old.

Mark McLean

Wide Diversity of mushrooms and plant species

Adolf Ceska

Noted mycologist Dr. Oluna Ceska.

Adolf Ceska

Phaeocollybia picaea

Dr. Oluna Ceska, a prominent BC mycologist, and Dr. Adolf Ceska, a retired biologist at BC's Conservation Data Centre, collected 100 species of mushrooms in one day in the upper Incomappleux. Twenty were found in a clearcut and a spectacular 80 species in the ancient rainforest; 41 of the 80 were coastal species. They included the rare old-growth rainforest mushroom, *Phaeocollybia piceae*. Uncommon even in coastal old-growth, at the time of its discovery in the Incomappleux it was (and likely still is) the first inland occurrence in BC. Its only other location in BC was Carmanah.

Jason Hollinger

Jason Hollinger

Jason Hollinger

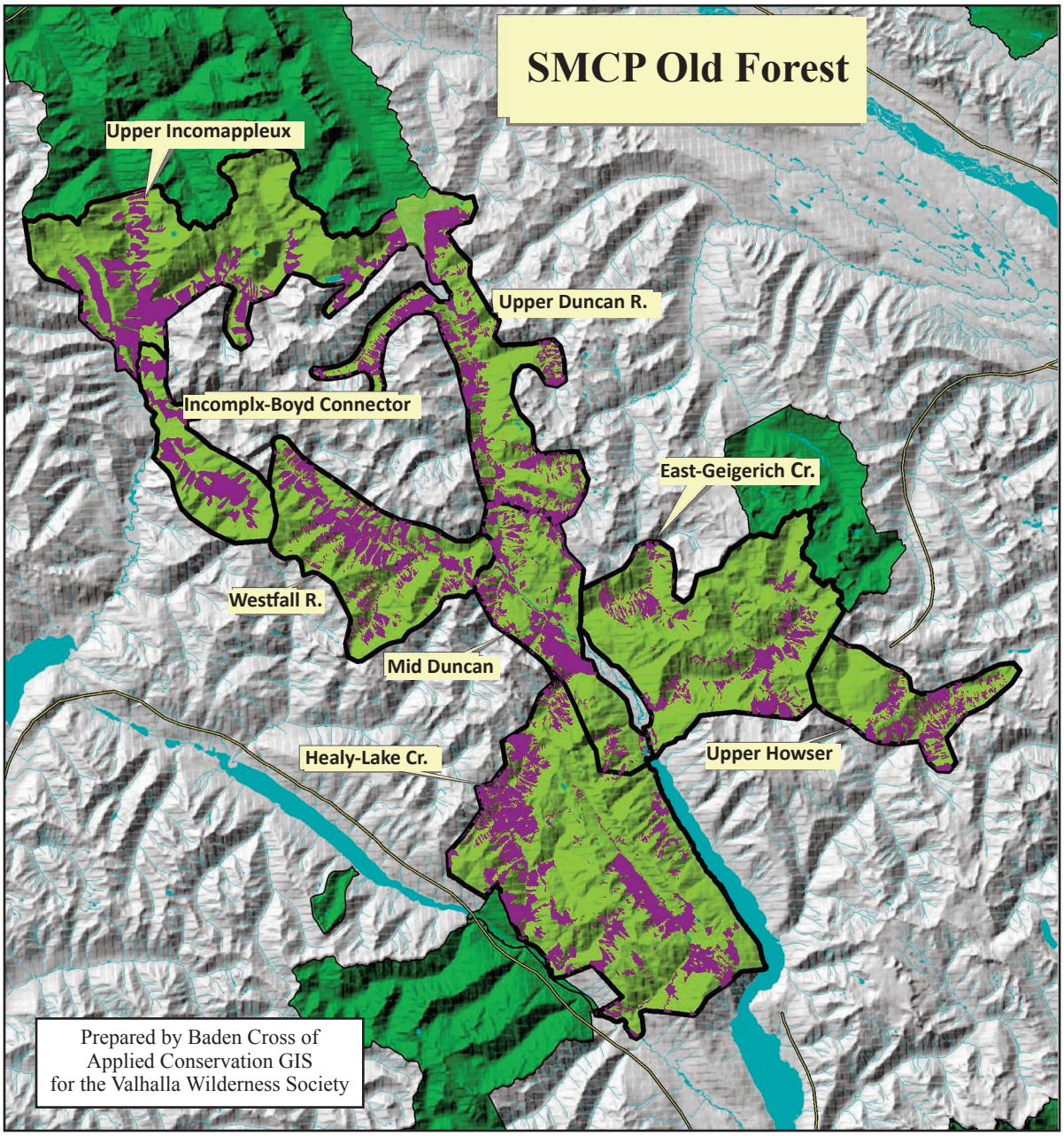
Anne Sherrod

Anne Sherrod

KELLIE CREEK WETLAND

The park proposal includes a heavily logged section of the Incomappleux River. It has an extensive wetland complex fed by Kellie Creek. Kellie Creek is threatened by a proposed private power development. Any such development on Kellie Creek could destroy the wetland by reducing its water supply.

The wetland contains Loesel's Twayblade (*Liparis loeselii*), as well as the Ochroleucous Bladderwort (*Urticularia ochroleuca*) — a plant that traps insects. Both plants are red-listed (endangered). The wetland also contains the blue-listed beaked spikerush, *Eleocharis rostellata*. Loesel's Twayblade is known to occur in only three other locations in BC. The Incomappleux population is the largest so far ever found in BC, but there are reports of another location within the park proposal that has a significant number.



Craig Pettitt

Big cedars along the middle section of the Duncan River.

Gary Diers

The Westfall River

THE PARK PROPOSAL: Duncan And Lardeau Watersheds

Healy-Lake Creek

The Lardeau River (right) is the only river feeding Kootenay Lake that is not blocked by dams, thus it is very important to the ecosystem. It has the only spawning grounds for the giant Gerrard trout of Kootenay Lake. In the summer of 2010 there were 30 blue-listed Great Blue Herons on the Lardeau River and abundant bald eagles. The Healy-Lake Creek part of this proposal would go down to the river and connect with the Goat Range Park. This is a key, historical mountain caribou travel corridor, and much of Lake Creek is intact except for a large burn.

James Bergdahl

Anne Sherrod

Accessible by 4-wheel drive, the spectacular alpine of Healy Creek offers easy cross-country hiking and sees many visitors every year. Caribou use it in autumn and winter.

Badshot Range

The Badshot Range divides the Lardeau and Duncan drainages. The alpine is accessible by Healy Creek 4-wheel drive road. With their breathtaking scenery, the Badshots have been visited by recreationists since the days of the silver and gold rush that flooded the valley with settlers in the early 1900s. Besides providing vast views of the Selkirk Mountains, the Badshots themselves are composed of spectacular limestone formations called karst. The high content of dissolvable minerals in the soil around karst formations is known to stimulate high diversity of plants and lichens. This area has significant use by mountain caribou.

East and Giegerich Creeks

The East Creek and Giegerich Creek tributaries of the Duncan were in the licence areas of Slocan Forest Products and Meadow Creek Cedar for many years. But because of a barrier of steep slopes at the start, they were not economically loggable. *They were classified as non-Timber Harvesting Land Base in the Mountain Caribou Recovery Plan.* Both of these creeks have huge old cedar trees, but it appears that some in Giergerich may have burned recently. Due to difficulty of access, these forests have not yet been scientifically surveyed for lichens and other biodiversity. These valleys are prized by wilderness explorers.

Gary Diers

East Creek in the park proposal, with Howser Spire in Bugaboo Park in the background.

Duncan River

The Duncan River originally was a vast valley of ancient Inland Temperate Rainforest, used extensively by mountain caribou. The easily accessible old-growth has largely been wiped out by clearcuts, but there are patches and slopes of low-elevation old-growth connected to the high-elevation mountain caribou habitat, and caribou still come down to these areas. The river has bull trout, rainbow trout, kokanee, mountain whitefish, unidentified sculpin and longnose dace. It is the major spawning route for bull trout, rainbow trout and kokanee salmon from Kootenay Lake. Intact Houston Creek has ESSF forest and heavily used game trails.

Loss Of Biodiversity Threatens Human Health And Survival

Mari Omori

Some scientists predict that the Earth will lose one-third of all species by 2050. Alarmed at the prospective collapse of ecosystem functions, scientists are urging governments to do their utmost to save species from extinction.

The threat of massive species loss threatens the collapse of the Earth's life support system. In many cases even a single, small, little-known organism turns out to be life-saving. An ocean-dwelling bacterium, *Prochlorococcus,* that was not discovered until 1986 turned out to produce 20% of the oxygen we breathe. *This tells us that even one single, tiny, nondescript species could be crucially important to future life on Earth. It tells us that the tiny, even invisible species, are worth as much concern as the larger ones; and that we must expend every effort to protect each and every one.*

The Pacific Yew tree was destroyed during logging operations until it was found to contain Taxol, which is now considered one of the most effective chemotherapy agents for ovarian, breast and other cancers. But scientists estimate that only about one in ten organisms have even been identified. Doctors ask, "How many species like the Pacific Yew are being lost without our ever knowing about them?"

How do parks fit into these needs? Fully protected core wilderness areas, if they are large enough, can buffer species against human impacts. They can provide refugia that will preserve many species which can disperse when conditions are hospitable.

Scientists believe that forests in Idaho may have acted as refugia for plants of the Inland Rainforest during a number of climate changes. As the glaciers of the last Ice Age receded, the cedar-hemlock forest and the lichens spread.

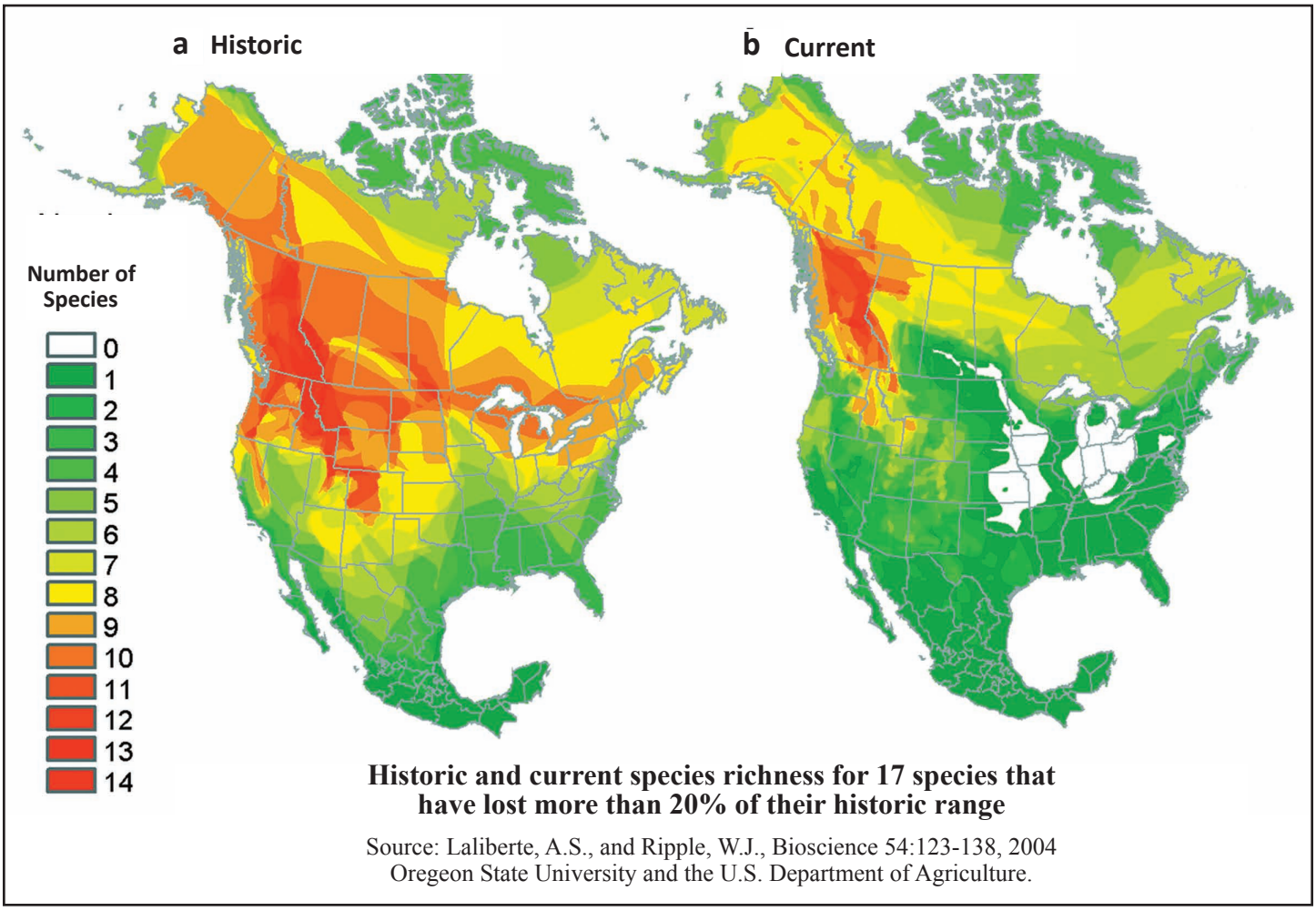
Botanist Curtis Björk has been tracking the likely dispersal patterns of rainforest plants between BC's inland and coastal rainforests. He states, "The migration of many plant species may not be able to outpace the rate of climate change, but preserving the connecting corridors of wild, non-degraded plant habitat may improve their chances."

Researchers from the University of Basel, Switzerland, have found that mountain ranges may offer refugia for many species during climate change. They found that the varied slope aspects and elevations produce a broad spectrum of microhabitats not present in most ecosystems, offering a wider range of survival conditions.

In terms of reducing climate change, the carbon densities measured in old-growth Coastal Temperate Rainforest of the Pacific Northwest are amongst the highest reported for any type of vegetation in the world. These are the forests that are closest to Inland Rainforest on this continent.

The Selkirk Mountain Caribou Park Proposal scores high in these respects, as does all ancient Inland Temperate Rainforest.

THE PARK PROPOSAL AND THE GLOBAL CRISES OF CLIMATE CHANGE AND SPECIES LOSS



Historic and current species richness for 17 species that have lost more than 20% of their historic range

Source: Laliberte, A.S., and Ripple, W.J., Bioscience 54:123-138, 2004
Oregeon State University and the U.S. Department of Agriculture.

BC the Last Refuge for Many Large Wildlife Species

Another word for the shrinking ranges of wildlife is "extirpation." It means that species gradually disappear across their range until they have been completely annihilated. Researchers have surveyed the current and historic ranges of 17 species of wildlife. The colours show how the ranges overlap. The dark green areas have only one of the 17 species. The colours get warmer as more species are present. The darkest red areas are where as many as 14 species overlap. British Columbia is almost the only place in North America with 12 or more of the species, the only other area as rich being a small strip in the Rocky Mountains of Alberta.

BC is the last refuge of a number of species that used to inhabit the U.S, eastern Canada and even Alaska and the Yukon. Black bear, grizzly bear, wolverine, gray wolf, elk and caribou have the most range contraction.

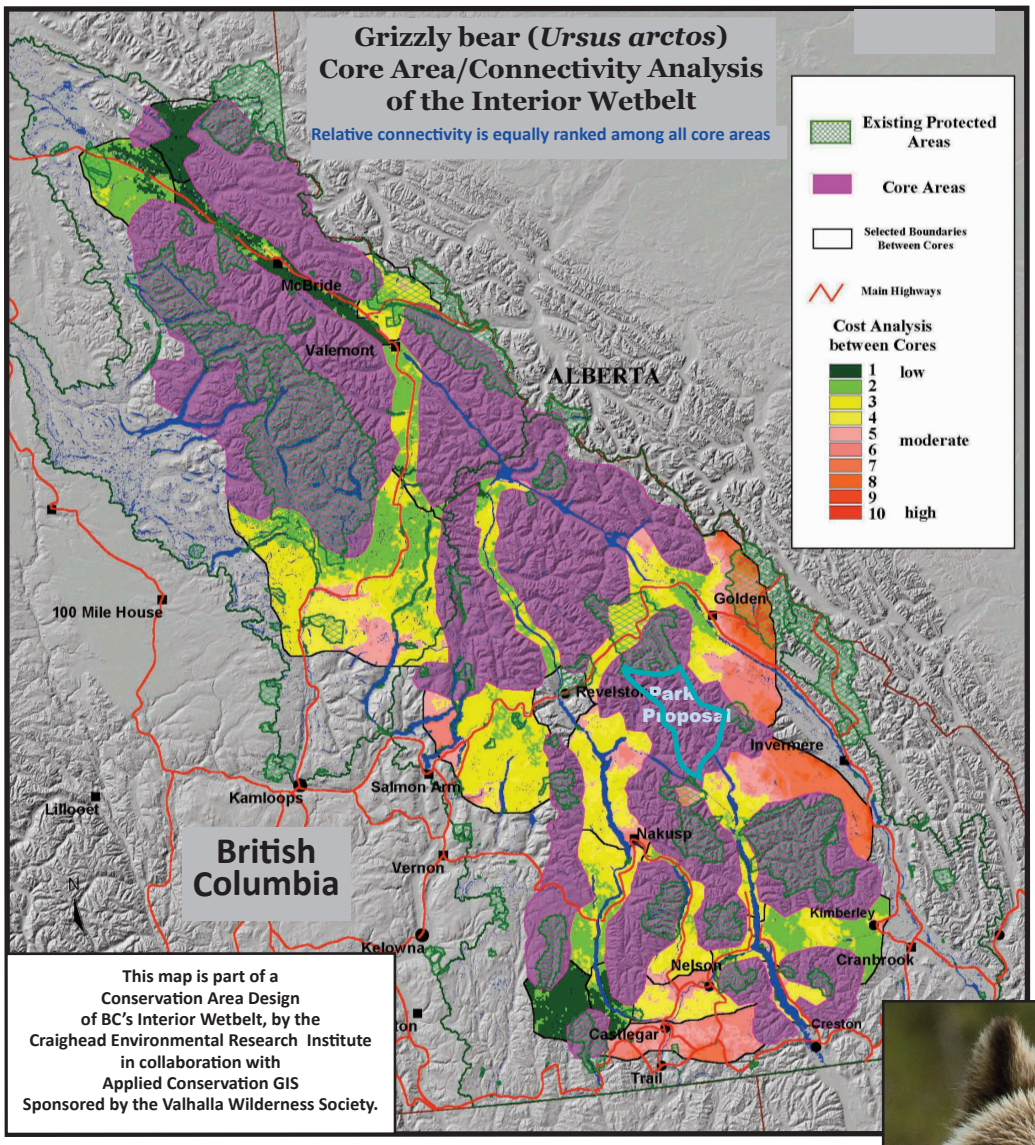
The maps also show ranges contracting within BC, from the south, from the Okanagan and from the coast, with the northern half of the Interior Wetbelt and the boreal forest being the remaining strongholds.

RANGE CONTRACTIONS OF SPECIES IN THE SELKIRK MOUNTAIN CARIBOU PARK PROPOSAL

Species	% of Historic Range Lost
Grizzly bear	53%
Gray wolf	43%
Wolverine	37%
Elk	74%
Mountain goat	31%
Fisher*	47%
River Otter	25%
Lynx	39%

Laliberte and Ripple, 2004

Park Proposal Is in Shrinking Grizzly Bear and Wolverine Core Habitat



The purple areas are core grizzly bear habitat in BC's Interior Wetbelt. The map shows that the land between four parks — Glacier, Goat Range, Valhalla and Bugaboo — is part of a large area of core habitat. The Selkirk Caribou Park Proposal is roughly outlined in light blue.

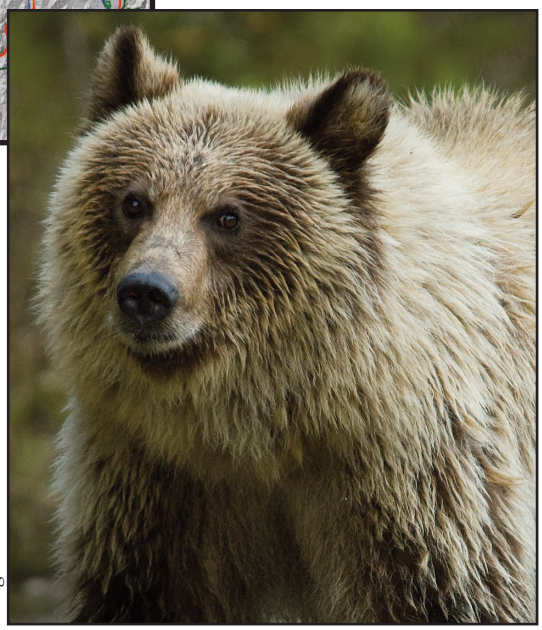
Core habitat areas become smaller in the south, fragmenting as they approach the U.S. border. Across the border, the bears are almost wiped out, existing mainly in Montana, with very few in Idaho and Washington. This represents encroaching disappearance of the bears from the intensely developed southern areas.

The maintenance of habitat connectivity down the spine of the Selkirks into the US is believed to be critical to the continued existence of grizzly bears across the border.

Claims that BC has the largest and healthiest grizzly bear population in Canada omit that the bears' range has shrunk by 54%. Shrinking range means less resilience to environmental change, less genetic diversity, more susceptibility to pressures. Nine species of bear worldwide are threatened.

Some scientists believe that the Central Selkirk and Purcell Mountains, in the area of this park proposal, have healthy populations of grizzly bears. However, bear-human conflicts in Glacier National Park and along the Trans Canada Highway and CPR mainline are thought to have taken a heavy toll on the grizzly bear population north of the park proposal. Bears of the central Selkirks and Purcells are besieged by threats from all directions, including logging roads, private power projects, swarms of off-road vehicles, hunting from ATVs, backcountry lodges, and mega tourism development such as the Jumbo Glacier Resort.

The Craighead Environmental Research Institute has recommended that 55% of the Inland Rainforest Region must be fully protected to maintain their grizzly bears. A similar conclusion was reached by scientists on the BC coast.



Craig Pettitt

A white grizzly cub of the Goat Range Provincial Park likely uses the park proposal as well. The bears need expanded protection.

Hydro Development Threatens Fisheries in Central Selkirks

Fish feed many levels of the food chain. They are also a key plank of food security to humans, but we are squandering them at a time when they are more important and more threatened than ever. Despite millions spent and decades of vigorous efforts to recover fisheries from the devastating impacts of dams, applications for independent power projects (IPPs) were invited and accepted for review without any regard whatsoever for the fish. For bull trout, continued efforts at conservation may be meaningless if the government approves IPP applications on Howser Creek (a tributary of the Duncan River), and on Incomappleux River and several of its tributaries.

Lee Harding

A 7.2-pound bull trout — Millions of dollars are spent to increase fish in the lakes while allowing their critical habitat in the rivers and creeks to be degraded or wiped out.

At one time the Kootenay, Duncan, and Arrow lakes comprised a fabulous, internationally-renowned sport fishery with giant rainbow trout and bull trout. But the fishing crashed with the fish in a series of blows in which logging, overfishing, and misguided stocking practices collaborated with the major impacts: dams on the Columbia and Duncan rivers. Each lake once had its own genetically unique form of giant rainbow trout. The Duncan Dam wiped out the giant trout in that system, and the Revelstoke Dam played a large role in wiping out the yellow-fin rainbow trout of the Arrow Lakes.

Over the long term, the dams blocked nutrients carried by the rivers into the lakes. This is why a keystone species of the lake ecosystems, the kokanee salmon, began crashing in the 1990s, and with that the whole lake ecosystems collapsed.

In the six years from 2003-04 to 2008-09, the Columbia Basin Fish and Wildlife Compensation Program spent $11.87 million on fisheries restoration, most of it on fertilization programs to compensate for nutrients blocked by the dams. (CBFWCP Annual Reports, 2003-04 to 2008-09.)

However, little heed has been paid to protecting the natural ecosystem from additional harm. Logging has destroyed considerable spawning habitat on rivers and creeks in the park proposal and elsewhere, especially for bull trout.

Howser Creek IPP

The IPP proposed for the Duncan River tributary, Howser Creek, would remove water from three creeks and push roads and powerlines into the area of Howser covered by this park proposal. However, public opposition to the power project has been huge. Recently BC Hydro cancelled its contract with applicant company, Axor. It is unknown what this means to the IPP application, which is still in the Environmental Assessment process.

The Incomappleux Watershed

There are at least five IPP applications on the Incomappleux River and its tributaries, at least two of which have bull trout. Imagine the effect of four IPPs on water flow in the river, all the way downstream to the Arrow Lakes. The Incomappleux, like the Lardeau River, is not blocked by dams, unlike the Westfall and Duncan. It is bringing precious natural nutrient flows into the nutrient-starved Arrow Reservoir that don't have to be bought by taxpayers' dollars, as well as providing critical spawning habitat.

"Proposals for small run-of-the-river hydroelectric projects in Arrow Lakes Reservoir tributaries should also be carefully reviewed by fisheries managers. Sites proposed for such projects are usually located in steep canyons where waterfalls occur. Migration obstructions and barriers for bull trout often occur at these same locations. It is common for a large proportion of a bull trout spawning population to stage for several weeks at the base of an obstruction or barrier....

The construction of diversion tunnels, head pools and penstocks in canyon sections used as staging areas by adult bull trout may affect their spawning distribution and eventual reproductive success. "

Decker and Hagen, June 2007
"Distribution of Adfluvial Bull Trout Production in Tributaries of the Arrow Lakes Reservoir..."

EXTERMINATION DEVELOPMENT OR A PARK?

There are more reasons to protect the precious remnants of our ancient Inland Temperate Rainforest. Future generations have a right to experience Nature's greatest creations. There is extremely little primeval rainforest in all of Canada where this can happen, and it is all in BC. These forests also provide the only form of carbon sequestration we have that is capable of functioning on a massive scale. The moderating influence of old-growth forest on climate is huge. It is inconceivable that, knowing what we do, we would just keep scalping the planet and leave little or nothing for the survival of our children.

Anne Sherrod

In this park proposal in the early part of this decade, a logging company drove a road over hydrologically unstable slopes above the Westfall River, into one of the most important areas for mountain caribou and bull trout. Loggers ran protesters off the road with their trucks. Pleas to the government and police to protect the rights of the protesters were ignored. The company stripped one side of the valley bottom of trees, completely destroying that side for mountain caribou, and began carving up the other side. Then it pulled out because it wasn't making money. Landslides have since closed the road. One day this will be viewed as barbarism by a generation that recognizes the enormity of the role these forests and this river play in the survival of life on Earth.

This can happen again. Interfor, the current licence holder in the upper Incomappleux, may have enough wealth from logging coastal forest to repair the road when market prices rise, and make a quick raid on the giant cedars of the Incomappleux. The Meadow Creek mill holds the licence to log critical intact mountain caribou habitat in Lake Creek. BC Timber Sales is proposing to contract out a strip of forest along Duncan Lake. And miners could get a permit to drive a road pretty much anywhere they like, just speculating to raise money on the stock exchange.

Alternatively, the governments of BC, or of Canada, could take this opportunity to implement the BC Auditor General's recommendations on connecting our parks to protect biodiversity. This park proposal represents the work of numerous people who have donated the field studies, mapping and research to present to the government a scientifically sound way to do this. Many generous public-spirited foundations and individuals have contributed to the effort. It is now up to the governments involved.

Appendix and References

A Forest Profile of Parks of the Interior Wetbelt

- **80% of all forest in the parks of the Central Columbia Mountains is low-biodiversity spruce-subalpine fir (ESSF), which starts at 1,400 metres (about half way up the mountainsides) and becomes progressively colder and sparser with higher elevation.**
- **82% of the forest recently set aside for mountain caribou is ESSF.**
- **36% of Glacier National Park and 31% of the Goat Range Provincial park are ESSF parkland (sparsely treed) or treeless.**
- **"Riparian areas in the valley bottoms occupy less than 0.6% of (Glacier National Park). Containing some of the oldest forest stands and rare sensitive species, these low elevation wetlands are critical to long-term ecological integrity. Forest harvesting outside the parks threaten this ecosystem." (GNP Management Plan)**
- **Of all Inland Rainforest protected in parks*:**
  - **33% is in *one* park: Wells Gray Provincial Park. The majority of this forest burned in the 1940s.**
  - **62% is in the large Cariboo Mountains park complex: Wells Gray, Cariboo Mountains and Bowron Lakes Provincial Parks.**
  - **81% of all protected Inland Rainforest is north of Glacier National Park, with 19% in or south of Glacier NP.**
  - **Glacier National Park protects 26,000 hectares of Inland Temperate Rainforest. Goat Range protects 10,100 ha. The latter has the only intact representation of our southernmost Inland Temperate Rainforest of significant size.**

* "Parks" = full protection, including all parks and protected areas 1,000 hectares or larger in BC.
Inland Rainforest = ICHvk and wk
Based upon BC government 2010 biogeoclimatic data for all parks in BC.

Park	Total Area	ICHvk1	ICHwk1	ICHm, d	ESSF	IMA-ESSFp
Purcell Wilderness Cons.	202,709	0	0	18,565	105,218	25,593
Goat Range Prov. Park	78,627	0	10,675	6,060	37,797	24,330
Glacier National Park	135,269	4,323	20,940	1,230	61,015	48,289
Proposed Selkirk Mtn Caribou Park	156,461	9,633	18,323	11,683	104,857	11,956

Sources: BCG figures for all the parks came from government data file "BECvar_by_PA_2010" except that for Monashee Park. Park sizes came from a different source. Because of some discrepancies in figures for Monashee Park, data from that park were obtained from a report by Kutenai Nature Investigations. Data for the park proposal came from Baden Cross, Applied Conservation GIS.

Old-growth in the Park Proposal by Biogeoclimatic Zone

Unit	Total ha	ICHvk OG	ICHwk OG	ICHvk+wk OG	ICH OG	ESSF OG	IMA/ESSFp	Clearcuts
Howser	8964	0	266	0	266	3830	1009	521
Upper Dun	16719	0	1043	1043	1043	4188	2078	279
East/Geig	26385	0	983	983	1283	2,277	8789	156
Healy/Lake	39452	0	1719	1719	3491	5398	8501	376
Westfall	16415	0	948	948	948	3498	4101	450
Mid Dun	13074	0	1782	1782	1908	1749	1591	704
Incmplx	27362	2997	0	2997	2997	2749	11824	54
Boyd Conn	8090	1301	112	1413	1413	971	2087	620
Total	156461	4298	6853	10,885	13.349	24660	39980	3160

A Sample of the Incomappleux Lichens and Plants

Bacidina contecta	lichen, new to science
Biatora ligni-mollis	lichen, new to science
Pertusaria diluta	lichen, new to science
Nephroma occultum Cryptic Paw Lichen	COSEWIC species of concern; not previously known south of the Adams River
Spilonemella americana	Oceanic lichen, rare inland
Pilophorus acicularis	Oceanic lichen - only three localities in inland North America
P. clavatus	Rare oceanic lichen, only 3 other locations inland
Lobaria retigera	Lichen, Rare inland, new to the Kootenays
Myochroidea minutula	Lichen, found nowhere else in the world but in the upper Incomappleus
Botrychium montanum (Mountain moonwort)	RED-LISTED, primitive fern, found primarily in old-growth cedar-hemlock
Hookeria lucens	Coastal moss found inland in only 2 other locations

Boyd Creek Canyon and Wetland Section of Park Proposal

Loxosporopsis coralifera	Lichen, very rare inland
Liparis loeselii (Loesel's Twayblade)	RED-LISTED, one of the rarest orchids in Canada
Urticularia ochroleuca (Ochroleucous Bladderwort)	RED-LISTED, insect-eating plant
Eleocharis rostellata (Beaked spikerush)	BLUE-LISTED, in marsh

Spribille, T., "Oceanic Macrolichens in the Incomappleux River Valley, southeastern British Columbia," Report to the Valhalla Wilderness Society, 2002.

Spribille, T., "Report on botanical surveys in the Incomappleux River," Report to the Valhalla Wilderness Society, 2004.

Spribille, T., Björk, C., Ekman, S., Elix, J., Goward, T., Printzen, C., Tonsberg, T., Wheeler, T., "Contributions to an epiphytic lichen flora of northwest North America: I. Eight new species from British Columbia inland rainforests," *The Bryologist,* bryo-112-01-08.3d 24/7/08 12:44:30.

References

Conservation Planning and Mapping

Craighead, L., "A Conservation Area Design of the Inland Rainforest of Canada," 2004.

Craighead, L., and Cross, B., "Identifying Core Habitat and Connectivity for Focal Species in the Interior Cedar-Hemlock Forest of North America to Complete a Conservation Area Design," USDA Forest Service Proceedings, RMRS-P-49, 2007.

Inland Temperate Rainforest and Lichens

Arsenault, A. and Goward, T., "Ecological Characteristics of Inland Rain Forests," At Risk: proceedings of a conference on the biology and management of species and habitats at risk, Kamloops, BC 15-29, ed. L.M. Darling, 1999, Vol. 1, pp. 437-439.

Björk, C., "Distribution patterns of disjunct and endemic vascular plants in the inerior wetbelt of northwest North America," *Botany* 88:409-428(2010).

Goward, T. and Spribille, T., "The Inland Rainforest Formation of Northwestern North America: A Lichenological Perspective," 2002.

Goward, T. and Spribille, T., "Lichenological evidence for the recognition of inland rain forests in western North America," J. Biogeogr., 2005, 32, 1209-1219.

Lichthardt, J., "Inventory of Giant Western Redcedar Groves on the Clearwater National Forest: 1998 Survey," Idaho Conservation Data Center.

Ministry of Forests, "The Ecology of the Interior Cedar-Hemlock Zone," QP #19043.

Spribille, T., "Oceanic Macrolichens in the Incomappleux River Valley, southeastern British Columbia," Report to the Valhalla Wilderness Society, 2002.

Spribille, T., "Report on botanical surveys in the Incomappleux River," Report to the Valhalla Wilderness Society, 2004.

Spribille, T., Björk, C., Ekman, S., Elix, J., Goward, T., Printzen, C., Tonsberg, T., Wheeler, T., "Contributions to an epiphytic lichen flora of northwest North America: I. Eight new species from British Columbia inland rainforests," *The Bryologist,* bryo-112-01-08.3d 24/7/08 12:44:30.

Mountain Caribou

Apps and McLellan, "Factors influencing the dispersion and fragmentation of endangered mountain caribou populations," *Biological Conservation* 130 (2006), p. 84-97.

Edwards, E.Y., "Fire and the Decline of Mountain Caribou," Journal of Wildlife Mgmt., Vol. 18, No. 4, Oct. 1954.

Hamilton, D., and Herbison, B., "Central Selkirk Caribou Project," Annual Report, September, 1998, for Slocan Forest Products.

Herbison, B., "Central Selkirks Caribou, Historic to Present Times: Apparent Trends and Emerging Priorities," for Pope & Talbot, Ltd., 1996.

Nanuq Consulting, "Central Selkirk Caribou Project," Annual Report, September, 1997, for Pope & Talbot.

Central Selkirk mountain caribou census data and wildlife sighting information reports,1996-2008, available on government website http://a100.gov.bc.ca/pub/siwe/details.do?id=723.

Fish and Fish Habitat

Bergdahl, J.C., "Bull Trout Streams of the Upper Columbia River Basin of Southeast British Columbia, with Notes on the Char's Ecology and Conservation Biology," Mar. 16, 1998.

Columbia Basin Fish & Wildlife Compensation Program, Annual Reports, 2003-04 to 2008-09.

Decker, S., and Hagen, J., "Distribution of Adfluvial Bull Trout Production In Tributaries of The Arrow Lakes Reservoir And The Feasibilty Of Monitoring Juvenile And Adult Abundance," Columbia Basin Fish and Wildlife Compensation Program, B.C. Hydro, June 2007.

Decker, S., and Hagen, J., "Adfluvial Bull Trout Spawner Abundance in Tributaries of the Arrow Lake Reservoir (2004-2007)," Columbia Basin Fish and Wildlife Compensation Program, B.C. Hydro, June 2008.

Legebokow, C.S., "Akolkolex River: Addressing Fish and Wildlife Habitat Values," *Streamline: Watershed Restoration Technical Bulletin,* Vol. 2, No. 4.

O'Brien, D. S., "Bull Trout Spawning Migrations in the Duncan River: Insights from Telemetry and DNA," Columbia Basin Fish & Wildlife Compensation Program, April, 2001.

Seaton, P., "Fish and Fish Habitat Inventory of the Incomappleux (Fish) River Tributaries," Pope & Talbot Ltd., 1998.

Wildlife (Other than caribou)

Krebs, J. A., and Lewis, D., "Wolverine Ecology and Habitat Use in the North Columbia Mountains: Progress Report," Proc. Biology and Mgmt. of Species and Habitats at Risk," Kamloops, BC, 15-19 Feb. 1999.

Laliberte, A.S., and Ripple, W.J., *Bioscience* 54:123-138, 2004, Oregeon State University and the U.S. Department of Agriculture.

Proctor, M.F., et al., "Genetic analysis reveals demographic fragmentation of grizzly bears yielding vulnerably small populations," *Proc. R. Soc B* (2005) 272, 2409-2416.

Woodroffe, R., and Ginsberg, J.R., "Edge Effects and the Extinction of Populations Inside Protected Areas," *Science,* Vol. 280, 1998.

Biodiversity

Ceska, O. 2004, "Incomappleux Valley – Macrofungi," Sept. 12, 2004, www.vws.org.

"Premier urged by Royal Society scientists to improve species protection," 29 Sept. 2010.

Chivian, E., and Bernstein, A., (Editors), Center for Health and the Global Environment, Harvard Medical School, *Sustaining Life: How Human Health Depends on Biodiversity*," 2008.

"Taking Nature's Pulse", Biodiversity BC website, http://www.biodiversitybc.org/EN/main/downloads/tnp-2.html

Glacier National Park

"Ecological Land Classification of Mount Revelstoke and Glacier National Parks, British Columbia, Vol. 1 & 2, Ed. Achuff, P.L. et al.

Mount Revelstoke, Glacier and Rogers Pass Management Plan, www.pc.gc.ca/docs/v-g/bc/glacier/pd-mp/sec4.aspx.