

Proposal for the Protection of **The Rainbow-Jordan Wilderness**



Douglas Noblet

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

**To secure a globally significant, high-biodiversity wilderness
of British Columbia's remaining inland temperate rainforest**

Initially proposed in 2019

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Executive Summary

The Rainbow-Jordan Wilderness is the most intact remaining inland temperate rainforest in British Columbia's Monashee Mountain Range.

The 10,493-hectare proposed park includes parts of three valleys, comprising a stretch of unroaded, intact wilderness of diverse habitats including ancient inland temperate rainforest (ITR), deciduous forest, and wetlands including a previously undocumented type.

Only 30 minutes north of Revelstoke, the Rainbow-Jordan is in the traditional territory of the Sinixt First Nation, also known as the Arrow Lake Indians, and is also claimed by the Syilx, Ktunaxa and Secwépemc First Nations. **The first ecological inventories of the Rainbow-Jordan in 2018 revealed one of the richest known examples of the globally rare inland temperate rainforest ecosystem, and one of the most intact ancient forests in the interior of British Columbia.**

Today, it has become a beloved learning and exploration wilderness for school groups, researchers, local and international photographers and conservation organizations. The proposal includes the most ecologically significant forests of Frisby Valley, Jordan Valley, and an unnamed valley referred to as "Rainbow" by a team of biologists commissioned by Valhalla Wilderness Society (VWS).



Amber Peters

Botanist Curtis Björk with an ancient western redcedar tree in Frisby Valley; its age estimated at over 1,500 years.

The proposal is an ancient reservoir of biodiversity with trees over 1,500-1,800 years of age, hundreds of lichen and other rainforest species and neighboring valleys of warm southern rainforest and cool northern rainforest types. The Rainbow-Jordan Wilderness is one of inland British Columbia's most ecologically significant forests and should be protected as a class-A Provincial Park or National Park to preserve the richest and greatest carbon-sequestering forest type of the interior wetbelt.

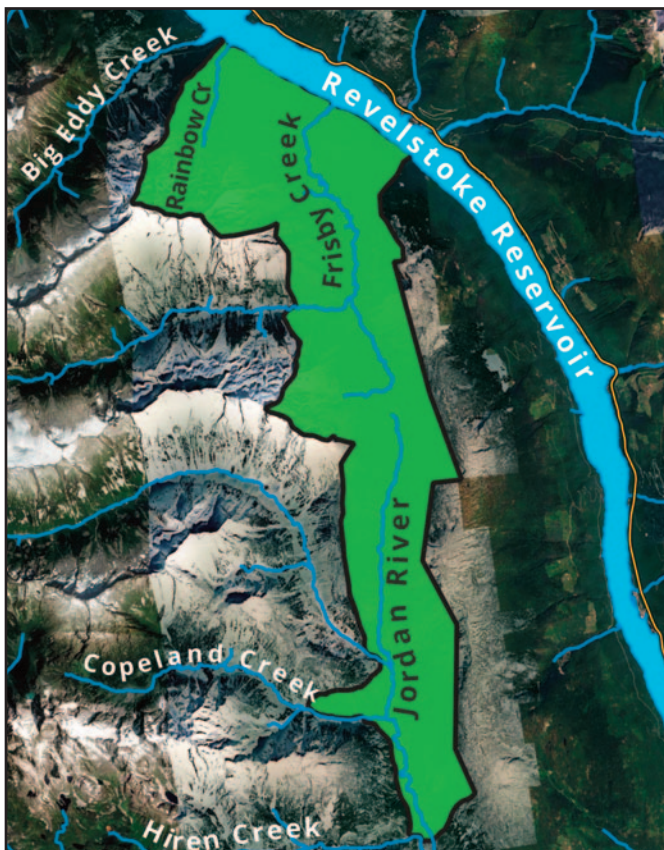


Figure 1: Location of the Proposed Rainbow-Jordan Wilderness Park

Cartography: Amber Peters 5/08/24
NAD 1983 BC Environment Albers

■ Proposed Park ■ Interior Wetbelt

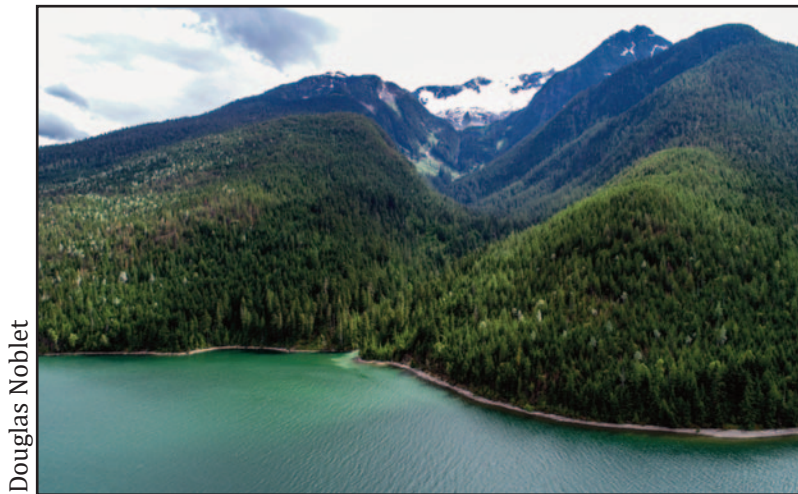
A Biodiversity Haven of the Inland Temperate Rainforest

The Rainbow Jordan Wilderness is among several Inland Temperate Rainforest sites known to science that have very high abundance and diversity of lichen species, including rare and threatened species as well as species previously found new to science.

Since the discovery of incredible biodiversity in the famous Incomappleux Valley, no other ITR ecosystem was thought to still exist with such intactness and richness.

While the Incomappleux Valley and part of the Robson Valley have been protected, ***the majority of British Columbia's most ancient and species-rich inland rainforest still remains unprotected.*** A significant intact remnant of this rare forest type is encompassed in VWS's Rainbow-Jordan Wilderness park proposal. The forest must be fully protected to preserve this globally rare ecosystem type in the Kootenay-Columbia region.

Inland temperate rainforest only exists in three places on Earth, and has been highly fragmented globally. It is globally rare because of the unique conditions required for rainforest to form outside of coastal ecosystems.



Douglas Noblet

The glacier-fed Rainbow Valley is a cool, northern-type rainforest valley with similar species to the Robson Valley over 200 km to the north.

Rainbow Valley (above) and Frisby Valley (Figure 1) are neighbouring valleys, but interestingly, they have very unique microclimates. One is a cooler rainforest type and one a warmer type. The understory of each old growth valley, the spacing of the giant trees, and the composition of lichens differ significantly. This diversity offers a unique research and education opportunity while providing complex microhabitats and climate refugia for myriad species, including large and small mammals, amphibians, birds and rare lichens and fungi.

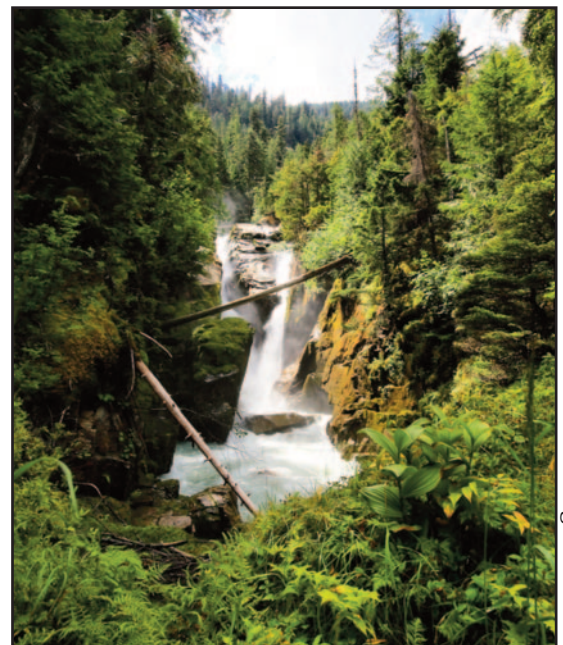
The Rainbow-Jordan is one example of such few remaining true rainforests in interior B.C. that its protection will mean a significant increase in refugia for certain rare species.



Fabien Stocco

Above is one of many ancient cedar trees in the proposal that are accessible along an increasingly popular hiking trail. The tree was entered in the British Columbia big tree registry along with two other giants in Frisby Valley. Deeper in the valley are even larger trees.

The inland rainforest is one of B.C.'s most biodiverse and underprotected ecosystems. It is one of the greatest carbon-sequestering ecosystems on Earth.



Douglas Noblet

Waterfall spray-zones on Frisby Creek are climate refugia that buffer drought conditions.

The Proposal - A New Park For Ancient Forest

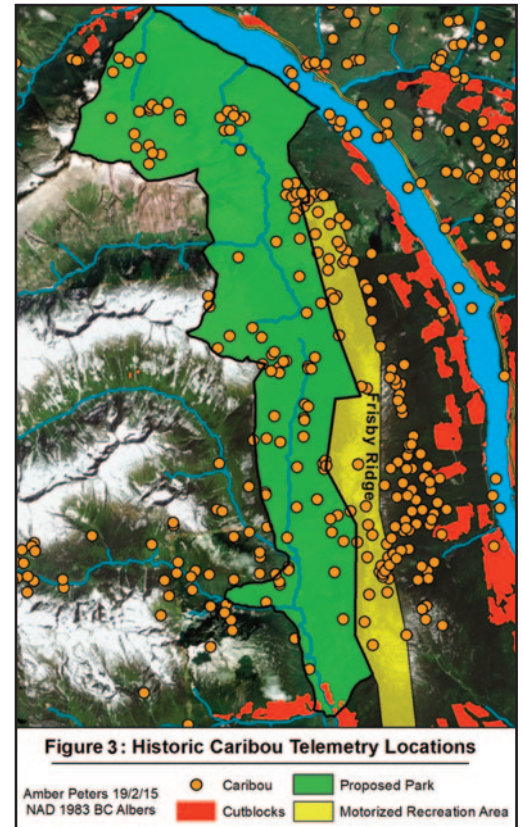
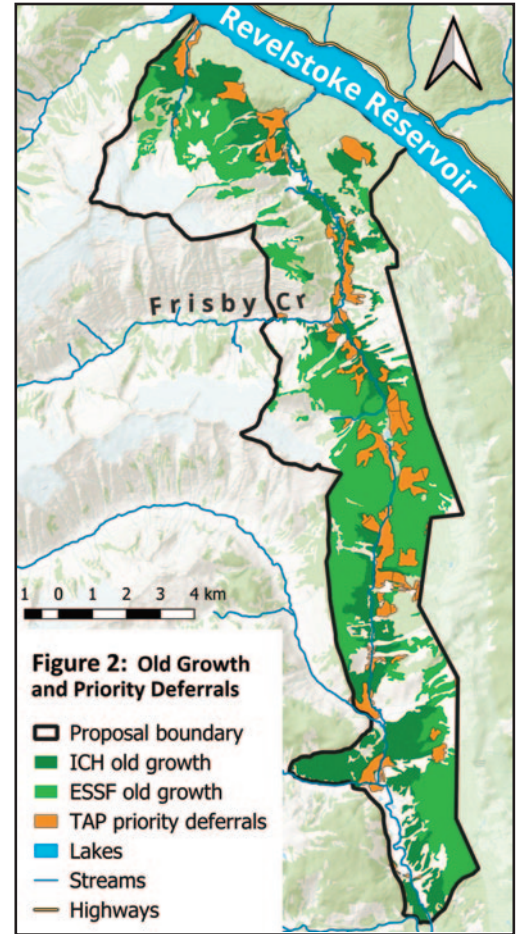
The Rainbow-Jordan Wilderness is a unique mosaic of habitat types interspersed between significant tracts of ancient inland temperate rainforest.

Only the wettest Interior Cedar-Hemlock forests (biogeoclimatic zone variants ICH wk and vk) are considered true rainforest. The intact, ancient remnants of these forests are now incredibly rare. ***They also harbour an assemblage of rare species, including old-growth-dependent and coastal rainforest species*** that can remarkably survive inland due to the consistent moisture in the last of these ancient, low elevation forests.

Most of the forest in the proposal is old growth (Appendix C), but significant tracts of ancient forest also remain with some individual trees estimated at up to 1,800 years of age. At one point in time the forest was home to a significant herd of Deep-Snow Mountain Caribou, but clearcut logging in adjacent valleys and rampant motorized recreation activity on the ridgetop have driven them out. Telemetry locations of historic caribou activity are shown in Figure 3 (Government of B.C. 1992-2003). Though the Frisby-Queest caribou herd is now down to 6 animals, **the rainforest still harbours thousands of other species in dire need of permanent, legislated protection.**

In 2021, 925 hectares of the proposal were recommended as Priority Deferral Areas by the Old Growth Technical Advisory Panel (TAP). The designation combines Prioritised Big-treed Old Growth, Remnant Old Ecosystems and Ancient Forests. Part of the proposal was designated a >90% intact watershed, but research and ground-truthing by VWS biologists revealed that the entire area now mapped as the proposed park is >90% intact.

All three watersheds in the proposal have Priority Deferral blocks in them, but these recommended deferral areas are still not protected. Even if they were, the deferrals are not enough to preserve the ecosystem because surrounding forest is needed to maintain the rainforest's microclimate, especially under increasing temperatures and drought conditions.



Amber Peters

Remarkably, the Rainbow-Jordan has remained almost completely untouched by humans, and has likely survived many centuries of natural disturbances, like wildfires, pests, disease, climate variation and roaring winds.

Inside a Highly Productive Interior Rainforest*

*Ecological productivity refers to the rate of biomass production in an ecosystem, in other words, how well an ecosystem can generate life.

The Rainbow-Jordan is one of the most productive forests in the interior wetbelt. Its ability to support and sustain life is unparalleled in much of our remaining wetbelt forest. In fact, forests of comparable diversity have been lost on a massive scale globally, and many parts of the world no longer have anything as ecologically rich.

The diversity of organisms that contribute to this rainforest have evolved over thousands of years to create **a very complex and resilient ecosystem** that scientists have only begun to understand.

This productivity emerges as wet carpets of lichen-encrusted moss, fields of wild ginger and rare ferns, giant skunk cabbage and fertile soil full of invertebrates that feed higher trophic levels. The forest floor is made up of ancient, decomposing trees that store their



Amber Peters

Natural creeks are stabilized by roots of live, old growth trees and fallen trees that also form bridges for wildlife. The forest acts as a sponge that releases water in perfect timing.

carbon under the thick rainforest humus.

There are species that only emerge from the forest floor every other year, or during precise conditions. Some species are only found in extremely specialized habitats. Therefore, the initial ecological inventories commissioned by VWS have only scratched the surface of the lifeforms that inhabit the Rainbow-Jordan.



Josh Henschel

Giant Skunk Cabbage and ferns inhabit the wet valley bottom along Frisby Creek. The thick vegetation provides cover for small animals while retaining moisture in the forest understory. They provide spring forage for bears, then decompose and add nutrients to the soil.

40% of Earth's insect species may go extinct over the next few decades as a result of climate change, habitat loss and degradation. Securing ancient ecosystems that are resilient to change can help us protect this foundation of the food web (Sánchez-Bayo et al. 2019).



Amber Peters

A diversity of butterflies, mushrooms and orchids are found throughout the forest and wetlands at various times of year.

Findings from Ecological Inventories

Exploratory research in the proposal area has led to the discovery of overwhelming levels of biodiversity.

Surprisingly, the region's most ecologically rich and intact rainforest hadn't received attention from the scientific community until VWS commissioned the taxonomic expertise of lichenologist Dr. Toby Spribille, botanist Curtis Bjork and mycologist Tyson Ehlers.

The preliminary surveys of lichens, plants, and macrofungi documented rare and at-risk species, and species new to B.C. or with few or no previous occurrences inland (Sherrod & Peters 2019). Though hundreds of species were documented, there are endless discoveries still to be made in the Rainbow-Jordan.



Dr. Toby Spribille's lichen surveys revealed a significant diversity of lichen species - an indication that high biodiversity is also present in other taxa.

SOME LICHENS ARE INDICATORS OF TRUE RAINFOREST, FOUND ONLY IN THE WETTEST, MOST PRISTINE ECOSYSTEMS

Preliminary surveys estimated hundreds of species of lichens alone, though species ID is still underway.

Lichens are indicators of ecosystem health. They are sensitive to pollution and moisture loss caused by forest fragmentation. A large number of lichen species indicates a very complex ecosystem with countless niches that contribute to the ecosystem's resilience under the pressure of climate change.

SIGNIFICANT FINDINGS IN THE RAINBOW-JORDAN

The Methuselah's Beard Lichen (*Usnea longissima*) (right) and Smoker's Lung Lichen (*Lobaria retigera*) (bottom) are rare species found in the initial surveys. They are both "flagship" species indicative of a very wet ecosystem where other rare lichens and bryophytes are likely to be found.



Antoine Simon



Douglas Noblet



Douglas Noblet

Lichens fix nitrogen in the soil and provide nesting materials for small animals. As a primary food source for Mountain Caribou and other animals, lichens play a fundamental role in the inland rainforest ecosystem.

The rapid loss of the ancient inland rainforest threatens the survival of species that rely directly on old growth-dependent lichens, and of species that are inextricably supported by their ecosystem function.

It was once widely believed that northern conifer forests were low in biodiversity. Today these forests are being recognized worldwide for their remarkable diversity that exists most abundantly in small forms such as lichens, fungi, and bryophytes. These smaller organisms form the basis of the entire food chain

The diversity of lichens found in the proposal rivals that of the most biodiverse inland rainforests known to science. All but one of the rare species found in the Incomappleux have been found in the Rainbow-Jordan Wilderness so far, plus a discovery that has never been found in the Incomappleux.

Plants & Lichens

PRELIMINARY FLORISTIC SURVEYS DOCUMENTED 238 SPECIES IN FRISBY VALLEY AND 256 SPECIES IN RAINBOW VALLEY

These initial plant and lichen species findings are based on three days of inventory by botanist Curtis Björk. Dr. Spribille's lichen findings, once identification is complete, will expand the inventory.

Similar to the Incomappleux, the Rainbow-Jordan may have new species to science yet to discover.

A total of 54 bryophytes (non-vascular plants including mosses and liverworts), 121 vascular plants and 80 lichen species have been documented in Rainbow Valley so far, with 40 bryophytes, 155 vascular plants and 43 lichen species in Frisby Valley.

"Documentation of much more species richness is to be expected in future inventory efforts." - (Björk 2018)



Douglas Noblet

Devil's Club (Oplopanax horridus) is one of countless medicinal plants in the Rainbow-Jordan. It has been used to cure illness for millenia by First Nations. Its berries are a late summer food for bears.

Every niche is fulfilled in this "climax" forest

The resilience of an ecosystem ("ecological integrity") increases with higher levels of biodiversity. The diversity of lifeforms in the proposal make it difficult for invasive species to establish and degrade it, or for the forest to succumb to disturbances like pests and disease outbreaks. On the other hand, B.C.'s vast landscape of plantation forests, which often have only a few tree species of the same age class, can be wiped out by a single disturbance event. They are also more prone to high-intensity fire (Broadland 2021).



Douglas Noblet

Ancient colonies of moss hang from the branches of giant cedar trees on lush river banks. They retain moisture during dry periods, prevent soil erosion, provide nesting material for birds and house tiny invertebrates that feed larger animals.

"In both drainages, only a single non-native species was observed. Otherwise, only native, noninvasive species were found in the study area, which is remarkable for any location in southern British Columbia. This may also be taken as an indication of the ecosystem health of the two drainages." (Björk 2018)

The Rainbow-Jordan's lush, native plant life also supports an abundance of insects that provide ecosystem services like pollination and nutrient cycling. These species provide the foundation of the whole food web.

The forest is a living library, and a seed bank for species rapidly disappearing across B.C.

Sustaining its genetic seed stock and pollinating insects could help us begin to restore degraded forests on surrounding landscapes if we allow the wilderness to persist. However, because of our warming climate and the cool, wet conditions required for an inland rainforest to have established thousands of years ago, we will never get a forest like the Rainbow-Jordan back if we lose it.



Amber Peters

Macrofungi

A preliminary survey found 112 taxa of macrofungi in under 5 hours.

Based on his findings, mycologist Tyson Ehlers conservatively estimates 1,000 species of fungi or more in the proposal area (Ehlers 2018).

Antoine Simon



Hypocrea leucopus - a rare, old-growth dependent species closely related to the *Cordyceps* fungus, was documented in a subsequent survey by Dr. Spribille. The species had not been documented in inland B.C. prior to this finding.

Ehlers found considerably higher species richness in the old growth forest compared to the young forest, mixed forest and riparian areas.

"Old-growth forests have greater structural complexity and ecological continuity, and provide more variety of habitats and stability over time to support a higher number of species, many of which are dependent on conditions specific to old-growth." (Ehlers 2018)

Rich fungal diversity in old growth suggests a complexity of underground mycelial networks that contribute greatly to the ecosystem's health and stability (Simard 2009).

Fungi have long been known to play a unique role as decomposers in an ecosystem. They also provide food for wildlife and an array of medicinal benefits to people. ***Edible and medicinal mushrooms are one of many non-timber forest products that offer sustainable and renewable economic value if their supporting forests are left intact.***

Perhaps an even greater benefit is the more recently recognized contribution that fungi make to global climate regulation, particularly through the storage of massive volumes of carbon in the living soils of old growth forests (Anthony 2024; Hawkins 2023).

Billions of tons of carbon dioxide flow from plants into underground fungal networks each year. These carbon flows help make soils the second-largest carbon sink after oceans (Society for the Protection of Underground Networks 2024).

Amber Peters



Tyson Ehlers



Amber Peters



Amber Peters



Tyson Ehlers

Habitats and Wildlife Values

The Rainbow-Jordan is an extensive wilderness shaped by thousands of years and numerous natural disturbances.



VWS trail camera

A significant diversity of habitats in the proposal area include:

- Young and mixed forest.
- Kilometers of valley-bottom, ancient rainforest, with many trees around 2-3 metres diameter and some measuring 3.5 m.
- Very old Englemann spruce-subalpine fir forest.
- Elfin hemlock forest of very old, gnarled trees uniquely stunted in size due to rocky growing sites.
- A cottonwood forest expected to be prime habitat for birds, bats and other wildlife, including possible at-risk species like fisher.
- Ancient western redcedar bear dens and avalanche paths full of bear and ungulate foods.
- Riparian areas including creeks, rivers and lakeshore.
- Cedar-skunk cabbage swamps and open-water wetlands.

TRAIL CAMERA MONITORING

To date, monitoring has confirmed moose, black bear, a marten or fisher, deer, marmot and either a cougar or lynx in the proposal area. Small mammal dens have been confirmed, as well as evidence of grizzly bear.

A study of wolverine in the North Columbia Mountains suggests that unroaded wilderness areas act as refugia for the species at risk. This is also true for grizzly bears and other at-risk wildlife in B.C. (Krebs & Lewis 1999; Proctor et al 2020).



Tévan Wilson

When old trees die they create complex habitat features that benefit many species, including birds that rely on decay to feed and create cavity nests.

- A marsh-fen of a previously undocumented type (Björk 2018).
- An alder swamp with trees full of coastal rainforest lichens.
- Talus rock slopes and rock cliffs likely to contain bat hibernacula.
- Wildlife tree-snags and upturned root wads used as bat roosts.
- A balch rockslide of giant boulders that funnel cold air through chambers allowing unique lichen colonies to grow.

Findings of pacific treefrog and western toad adjacent to a wetland suggests a locally important amphibian breeding habitat in the proposal.



Amber Peters

"Loss of numerous valley-bottom wetlands and old redcedar forests from the flooding for Revelstoke dam reservoir makes these wetlands significant from a rainforest biodiversity perspective, confirming the value of the study area as a potential park." - (McCrory 2018)



Amber Peters

VWS Directors with an ancient cedar bear den tree.



Amber Peters

Tourism - Discovery - Cultural Legacy

THE RAINBOW-JORDAN WILDERNESS OFFERS A UNIQUE OPPORTUNITY FOR B.C. TOURISM.

Visitors can venture into the proposed park from multiple access points that lead to unique scenic wonders of an ancient world.

Travelling along established wildlife trails, they experience rare ecosystems never altered by human beings. The ancient cathedral forests surrounded by towering mountain peaks create a feeling of true wildness, of solitude, and a time in the distant past.

British Columbians and visitors love our parks, and *the cathedral forests that our province is known for are seriously underrepresented in our parks system.*

More people are flocking to parks each year to experience the last of these wonders. Park visitation has increased steadily over the years, with a 24% increase from 2014 to 2018 (BC Parks 2024), and in 2021 a record of 3.1 million campers visited B.C. Parks (BC Gov News 2021)

In 2009 alone parks tourism added a \$392 million boost to Canada's GDP and over 5,200 full-time jobs. (Canadian Parks Council 2011)



Douglas Noblet

Old growth forests that are treasured by wilderness explorers and parks visitors are also vital to the preservation of biodiversity.



Amber Peters



Douglas Noblet

The Rainbow-Jordan Wilderness is the most accessible, intact rainforest in the southern Interior Wetbelt. A canoe ride across Revelstoke Reservoir and short hike leads visitors to a pristine, ancient forest that continues for kilometers through unroaded valleys.

BRITISH COLUMBIA'S IRREPLACEABLE HERITAGE

The Rainbow-Jordan lies within the area of a traditional village site of a large band of Sinixt peoples. Much of their cultural heritage has been lost through overdevelopment and resource extraction in similar ecosystems that have since disappeared.

However, many of the plants, mushrooms, lichens and animals that once sustained First Peoples of the interior wetbelt are still present in the Rainbow Jordan today.

This intact wilderness offers an invaluable opportunity to learn about British Columbia's heritage.

Our old growth forests are who we are as British Columbians, and preserving what remains is vital to the preservation of our history and connection to this land.



Douglas Noblet

This ancient ecosystem is a library of information with immeasurable benefit to human health and medicine, clues to advancement in technology and engineering, and keys to uncovering the secrets of life itself.

Why British Columbia Needs More Parks

“Despite its declared intentions and clear vision to conserve the ecological integrity in British Columbia’s parks and protected areas, the Ministry of Environment is not successfully meeting this goal.”- (Auditor General 2010)

In 2010, the Auditor General found, as scientists had long expressed, that **not enough of B.C. is protected for even our parks to persist into the future.** Ecosystems must be large and connected to maintain their resilience on a rapidly changing landscape. Now more than ever, B.C. needs intact ecosystems to help stabilize our landscape and climate.



Amber Peters

Old growth forests are now considered a non-renewable resource.

In 2007 the Ministry of Environment acknowledged why we need parks:

- To preserve ecosystem services including food production, water purification, waste treatment, oxygen production, climate regulation, flood protection, erosion control, and many other services.
- To protect biodiversity: Many protected areas in B.C. include habitat for rare species, important genetic resources, and unique botanical or zoological phenomena.
- To preserve wilderness: Protection allows species, including humans, the best possible circumstances to live and adapt to long-term changes such as climate change.

British Columbia has over 2,000 known species at risk, and research suggests way may only know 14% of species on land globally (Mora et al. 2011). The province is losing species without knowing what has been lost.



Sarah Newton

If they are logged, these forests under the pressure of climate change will never return to what they once were, even if they are allowed to grow past an 80-year harvest cycle.

Our truly intact ancient forests have almost been completely liquidated in B.C.

Less than 1% remain of our productive cathedral forests (Price et al. 2020), and the inland temperate rainforest ecosystem in particular is very underrepresented in our parks system.

“These ecosystems are effectively the white rhino of old growth forests. They are almost extinguished, and will not recover from logging.” (Price et al. 2020)

It is imperative that the last few examples of these forests be protected as parks for future generations and all species that inhabit them.

Our huge list of at-risk species will only continue to grow as the rarest habitats become increasingly imperilled. Protecting this ancient legacy of a globally significant rainforest is fundamental to halting the collapse of B.C.’s unique inland temperate rainforest.

As a haven of biodiversity and refuge in a time of climate change, park status for the Rainbow-Jordan should be a priority for B.C.

In the Rainbow-Jordan Wilderness, life still flourishes in a resilient and undisturbed system. While parts of the scenic landscape are accessible to hikers, there are deeper parts of the wilderness that remain as untouched mysteries teeming with biodiversity. Abundant ecosystem services provided by pristine remaining habitats such as the Rainbow-Jordan Wilderness are necessary to sustain life on Earth. Securing these last ancient refugia that are also resilient to climate change is crucial to our survival.

APPENDIX A - At-Risk Animal Species

The following table lists provincially or COSEWIC-listed animal species confirmed or that may occur in the proposal area. It was compiled through the BC Species and Ecosystem Explorer using a custom polygon encompassing the Rainbow-Jordan Wilderness proposal. Search Criteria: Animals; Vertebrates & Invertebrates AND BC Blue or Red-listed OR COSEWIC listed as Endangered (E), Threatened (T), or Special Concern (SC) (B.C. Conservation Data Centre 2024). Note that data is limited and complete animal inventories are still needed.

Table 1: Provincially or COSEWIC-listed animal species confirmed or that may occur in the proposal area.

Scientific Name	English Name	BC List	COSEWIC
<i>Accipiter atricapillus atricapillus</i>	American Goshawk, atricapillus subspecies	Blue	NAR
<i>Acipenser transmontanus</i>	White Sturgeon	No Status	E/T
<i>Acipenser transmontanus</i> pop. 1	White Sturgeon (Upper Kootenay River Population)	Red	E
<i>Acipenser transmontanus</i> pop. 2	White Sturgeon (Upper Columbia River Population)	Red	E
<i>Acipenser transmontanus</i> pop. 5	White Sturgeon (Upper Fraser River Population)	Red	E
<i>Aechmophorus clarkii</i>	Clark's Grebe	Red	
<i>Aechmophorus occidentalis</i>	Western Grebe	Red	SC
<i>Aeronautes saxatalis</i>	White-throated Swift	Blue	
<i>Aeshna constricta</i>	Lance-tipped Darner	Blue	
<i>Ambystoma mavortium</i>	Western Tiger Salamander	Red	E
<i>Anaxyrus boreas</i>	Western Toad	Yellow	SC
<i>Anguispira kochi</i>	Banded Tigersnail	Blue	NAR
<i>Aplodontia rufa</i>	Mountain Beaver	Blue	SC
<i>Apodemia mormo</i>	Mormon Metalmark	Red	E
<i>Ardea herodias herodias</i>	Great Blue Heron, herodias subspecies	Blue	
<i>Argia vivida</i>	Vivid Dancer	Blue	SC
<i>Ascaphus montanus</i>	Rocky Mountain Tailed Frog	Blue	T
<i>Asio flammeus</i>	Short-eared Owl	Blue	T
<i>Bartramia longicauda</i>	Upland Sandpiper	Red	
<i>Boloria alberta</i>	Albert's Fritillary	Blue	
<i>Botaurus lentiginosus</i>	American Bittern	Blue	
<i>Buteo lagopus</i>	Rough-legged Hawk	Blue	NAR
<i>Buteo swainsoni</i>	Swainson's Hawk	Red	
<i>Butorides virescens</i>	Green Heron	Blue	
<i>Callophrys affinis</i>	Immaculate Green Hairstreak	Blue	
<i>Catherpes mexicanus</i>	Canyon Wren	Blue	NAR
<i>Charina bottae</i>	Northern Rubber Boa	Yellow	SC
<i>Chlosyne hoffmanni</i>	Hoffman's Checkerspot	Red	
<i>Chondestes grammacus</i>	Lark Sparrow	Blue	
<i>Chordeiles minor</i>	Common Nighthawk	Blue	SC
<i>Chrysemys picta</i>	Painted Turtle	No Status	T/SC
<i>Chrysemys picta</i> pop. 2	Painted Turtle - Intermountain - Rocky Mountain Population	Blue	SC
<i>Cicindela hirticollis</i>	Hairy-necked Tiger Beetle	Blue	
<i>Coccythraustes vespertinus</i>	Evening Grosbeak	Yellow	SC

Table 1 continued

Scientific Name	English Name	BC List	COSEWIC
<i>Coccyzus americanus</i>	Yellow-billed Cuckoo	Red	
<i>Colias meadii</i>	Mead's Sulphur	Blue	
<i>Coluber constrictor</i>	North American Racer	Blue	T
<i>Contopus cooperi</i>	Olive-sided Flycatcher	Yellow	SC
<i>Copablepharon absidum</i>	Columbia Dune Moth	Red	DD
<i>Corynorhinus townsendii</i>	Townsend's Big-eared Bat	Blue	
<i>Cottus confusus</i>	Shorthead Sculpin	Blue	SC
<i>Cottus hubbsi</i>	Columbia Sculpin	Blue	SC
<i>Cottus</i> sp. 9	Rocky Mountain Sculpin	Red	SC
<i>Cryptomastix mullani</i>	Coeur d'Alene Oregonian	Blue	
<i>Cupido comyntas</i>	Eastern Tailed Blue	Blue	
<i>Cygnus columbianus</i>	Tundra Swan	Blue	
<i>Cypseloides niger</i>	Black Swift	Blue	E
<i>Danaus plexippus</i>	Monarch	Red	E
<i>Dolichonyx oryzivorus</i>	Bobolink	Red	SC
<i>Dryobates albolarvatus</i>	White-headed Woodpecker	Red	E
<i>Enallagma clausum</i>	Alkali Bluet	Blue	
<i>Epargyreus clarus clarus</i>	Silver-spotted Skipper, clarus subspecies	Blue	
<i>Erebia magdalena</i>	Magdalena Alpine	Blue	
<i>Eremobates scaber</i>		Red	
<i>Eremophila alpestris merrilli</i>	Horned Lark, merrilli subspecies	Red	
<i>Euphagus carolinus</i>	Rusty Blackbird	Blue	SC
<i>Euphydryas gillettii</i>	Gillette's Checkerspot	Blue	
<i>Euptoieta claudia</i>	Variegated Fritillary	Blue	
<i>Falco mexicanus</i>	Prairie Falcon	Red	NAR
<i>Falco peregrinus</i>	Peregrine Falcon	No Status	SC
<i>Falco rusticolus</i>	Gyrfalcon	Blue	NAR
<i>Fisherola nuttalli</i>	Shortface Lanx	Red	E
<i>Fluminicola fuscus</i>	Ashy Pebblesnail	Red	
<i>Galba bulimoides</i>	Prairie Fossaria	Blue	
<i>Galba dalli</i>	Dusky Fossaria	Blue	
<i>Galba obrussa</i>	Golden Fossaria	Blue	
<i>Galba truncatula</i>	Attenuate Fossaria	Blue	
<i>Gulo gulo</i>	Wolverine	No Status	SC
<i>Gulo gulo luscus</i>	Wolverine, luscus subspecies	Blue	SC
<i>Gyraulus crista</i>	Star Gyro	Blue	
<i>Hemerotrecha</i> sp. 1		Red	
<i>Hemphillia camelus</i>	Pale Jumping-slug	Blue	
<i>Hesperia nevada</i>	Nevada Skipper	Blue	
<i>Hirundo rustica</i>	Barn Swallow	Yellow	SC
<i>Hydroprogne caspia</i>	Caspian Tern	Blue	NAR
<i>Icteria virens</i>	Yellow-breasted Chat	Red	E
<i>Kootenaia burkei</i>	Pygmy Slug	Blue	SC
<i>Larus californicus</i>	California Gull	Red	

Table 1 continued

Scientific Name	English Name	BC List	COSEWIC
<i>Lasionycteris noctivagans</i>	Silver-haired Bat	Yellow	E
<i>Lasiurus cinereus</i>	Hoary Bat	Blue	E
<i>Lepus townsendii</i>	White-tailed Jackrabbit	Red	
<i>Limenitis archippus</i>	Viceroy	Red	
<i>Limnodromus griseus</i>	Short-billed Dowitcher	Red	
<i>Lithobates pipiens</i>	Northern Leopard Frog	Red	E
Lota lota pop. 1	Burbot (Lower Kootenay Population)	Red	
<i>Lycaena dione</i>	Dione Copper	Blue	
<i>Lycaena hyllus</i>	Bronze Copper	Blue	
<i>Lycaena nivalis</i>	Lilac-bordered Copper	Blue	
<i>Magnipelta mycophaga</i>	Magnum Mantleslug	Blue	SC
<i>Megascops kennicottii</i>	Western Screech-Owl	No Status	T
<i>Megascops kennicottii macfarlanei</i>	Western Screech-Owl, macfarlanei subspecies	Blue	T
<i>Melanerpes lewis</i>	Lewis's Woodpecker	Blue	T
<i>Melanitta perspicillata</i>	Surf Scoter	Blue	
<i>Musculium partumeium</i>	Swamp Fingernailclam	Blue	
<i>Musculium transversum</i>	Long Fingernailclam	Blue	
<i>Myotis lucifugus</i>	Little Brown Myotis	Blue	E
<i>Myotis septentrionalis</i>	Northern Myotis	Blue	E
<i>Nannopterum auritum</i>	Double-crested Cormorant	Blue	NAR
<i>Neotamias minimus oreocetes</i>	Least Chipmunk, oreocetes subspecies	Blue	
<i>Neotamias minimus selkirkii</i>	Least Chipmunk, selkirkii subspecies	Red	
<i>Neotamias ruficaudus ruficaudus</i>	Red-tailed Chipmunk, ruficaudus subspecies	Red	
<i>Neotamias ruficaudus simulans</i>	Red-tailed Chipmunk, simulans subspecies	Blue	
<i>Numenius americanus</i>	Long-billed Curlew	Yellow	T
<i>Nycticorax nycticorax</i>	Black-crowned Night-Heron	Red	
<i>Oeneis jutta chermocki</i>	Jutta Arctic, chermocki subspecies	Blue	
<i>Oncorhynchus clarkii clarkii</i>	Cutthroat Trout, clarkii subspecies	Blue	
<i>Oncorhynchus clarkii lewisi</i>	Cutthroat Trout, lewisi subspecies	Blue	SC
<i>Ophiogomphus occidentis</i>	Sinuous Snaketail	Blue	
<i>Oreamnos americanus</i>	Mountain Goat	Blue	
<i>Oreohelix subrudis</i>	Subalpine Mountainsnail	Blue	
<i>Oreoscoptes montanus</i>	Sage Thrasher	Red	E
<i>Ovis canadensis</i>	Bighorn Sheep	Blue	
<i>Patagioenas fasciata</i>	Band-tailed Pigeon	Blue	SC
<i>Pelecanus erythrorhynchos</i>	American White Pelican	Red	NAR
<i>Phalaropus lobatus</i>	Red-necked Phalarope	Blue	SC
<i>Pholisora catullus</i>	Common Sootywing	Blue	
<i>Physella columbiana</i>	Rotund Physa	Red	
<i>Physella virginea</i>	Sunset Physa	Blue	
<i>Planorbula campestris</i>	Meadow Rams-horn	Blue	
<i>Plestiodon skiltonianus</i>	Western Skink	Blue	SC
<i>Plethodon idahoensis</i>	Coeur d'Alene Salamander	Blue	SC
<i>Pluvialis dominica</i>	American Golden-Plover	Blue	

Table 1 continued

Scientific Name	English Name	BC List	COSEWIC
<i>Podiceps nigricollis</i>	Eared Grebe	Blue	
<i>Polites sabuleti</i>	Sandhill Skipper	Red	
<i>Polites sonora</i>	Sonora Skipper	Blue	NAR
<i>Polites themistocles themistocles</i>	Tawny-edged Skipper, themistocles subspecies	Blue	
<i>Pristiloma arcticum</i>	Northern Tightcoil	Blue	
<i>Progne subis</i>	Purple Martin	Blue	
<i>Pyrgus communis</i>	Checkered Skipper	Blue	
Rangifer tarandus pop. 1	Caribou (Southern Mountain Population)	Red	E
Rangifer tarandus pop. 15	Caribou (Northern Mountain Population)	Blue	SC
<i>Recurvirostra americana</i>	American Avocet	Blue	
<i>Rhinichthys umatilla</i>	Umatilla Dace	Red	T
<i>Salvelinus confluentus</i>	Bull Trout	Blue	SC
<i>Satyrium behrii</i>	Behr's Hairstreak	Red	E
<i>Satyrium californica</i>	California Hairstreak	Blue	
<i>Satyrium semiluna</i>	Half-moon Hairstreak	Red	T
<i>Setophaga castanea</i>	Bay-breasted Warbler	Red	
<i>Setophaga virens</i>	Black-throated Green Warbler	Blue	
<i>Somatochlora brevicincta</i>	Quebec Emerald	Blue	
<i>Somatochlora forcipata</i>	Forcipate Emerald	Blue	
<i>Speyeria aphrodite manitoba</i>	Aphrodite Fritillary, manitoba subspecies	Blue	
<i>Speyeria mormonia erinna</i>	Mormon Fritillary, erinna subspecies	Red	
<i>Sphaerium occidentale</i>	Herrington Fingernailclam	Blue	
<i>Sphaerium striatinum</i>	Striated Fingernailclam	Blue	
<i>Sphyrapicus thyroideus</i>	Williamson's Sapsucker	Blue	E
<i>Stagnicola caperata</i>	Wrinkled Marshsnail	Blue	
<i>Stagnicola traski</i>	Widelip Pondsnail	Blue	
<i>Sterna forsteri</i>	Forster's Tern	Red	DD
<i>Synaptomys borealis artemisiae</i>	Northern Bog Lemming, artemisiae subspecies	Blue	
<i>Taxidea taxus</i>	American Badger	Red	E
<i>Thomomys talpoides segregatus</i>	Northern Pocket Gopher, segregatus subspecies	Red	
<i>Tyto alba</i>	Barn Owl	Blue	T
<i>Ursus arctos</i>	Grizzly Bear	Blue	SC
<i>Valvata humeralis</i>	Glossy Valvata	Red	
<i>Valvata tricarinata</i>	Threeridge Valvata	Red	
<i>Vertigo ventricosa</i>	Tapered Vertigo	Red	
<i>Zacoleus idahoensis</i>	Sheathed Slug	Red	SC

APPENDIX B - At-Risk Plants, Lichens and Ecological Communities

Table 2 below lists provincially or COSEWIC-listed plant and lichen species confirmed or that may occur in the proposal area. It was compiled through the BC Species and Ecosystem Explorer using a custom polygon encompassing the Rainbow-Jordan Wilderness proposal. Search Criteria: Lichens AND Plants; Vascular plants and Bryophytes AND BC Blue or Red-listed OR COSEWIC listed as Endangered (E), Threatened (T), or Special Concern (SC). Note that initial inventories have confirmed far more species presented than listed here and that complete inventories and lichen ID from initial inventories are still needed. Table 3 lists provincially at-risk ecological communities that may be present in the proposal area (B.C. Conservation Data Centre 2024).

Table 2: Provincially or COSEWIC-listed plant and lichen species confirmed or that may occur in the proposal area.

Scientific Name	English Name	BC List	COSEWIC
<i>Arctoparmelia subcentrifuga</i>	abrading ring	Blue	
<i>Bartramia halleriana</i>	Haller's apple moss	Blue	T
<i>Botrychium campestre</i> var. <i>lineare</i>	Linear-leaf moonwort	Blue	
<i>Botrychium michiganense</i>	Michigan moonwort	Blue	
<i>Botrychium montanum</i>	mountain moonwort	Blue	
<i>Cladonia cyanipes</i>	blue-footed pixie	Blue	
<i>Cladonia decorticata</i>	strip-tease pixie	Blue	
<i>Cladonia luteoalba</i>	lemon pixie	Blue	
<i>Claytonia cordifolia</i>	heart-leaved springbeauty	Blue	
<i>Collema bachmanianum</i>	Caesar's tarpaper	Blue	
<i>Collema coniophilum</i>	crumpled tarpaper	Red	T
<i>Eleocharis nitida</i>	slender spike-rush	Blue	
<i>Evernia divaricata</i>	mountain oakmoss	Blue	
<i>Leptogium cyanescens</i>	blue-blue vinyl	Red	
<i>Liparis loeselii</i>	yellow widelip orchid	Blue	
<i>Lobaria retigera</i>	smoker's lung	Blue	T
<i>Nephroma isidiosum</i>	pebbled paw	Blue	
<i>Nephroma occultum</i>	cryptic paw	Blue	T
<i>Peltigera gowardii</i>	northwest waterfan	Red	SC
<i>Pinus albicaulis</i>	whitebark pine	Blue	E
<i>Pinus flexilis</i>	limber pine	Blue	E
<i>Scouleria marginata</i>	marginated streamside moss	Red	E
<i>Sisyrinchium idahoense</i> var. <i>occidentale</i>	Idaho blue-eyed grass	Red	
<i>Utricularia ochroleuca</i>	ochroleucous bladderwort	Blue	

Table 3: Provincially-listed ecological communities that may occur in the proposal area.

Scientific Name	English Name	BC List
<i>Alnus incana</i> / <i>Cornus sericea</i> / <i>Athyrium filix-femina</i>	mountain alder / red-osier dogwood / lady fern	Blue
<i>Alnus incana</i> / <i>Equisetum arvense</i>	mountain alder / common horsetail	Blue
<i>Carex lasiocarpa</i> / <i>Drepanocladus aduncus</i>	slender sedge / common hook-moss	Blue
<i>Dulichium arundinaceum</i> Herbaceous Vegetation	three-way sedge	Red
<i>Menyanthes trifoliata</i> - <i>Carex lasiocarpa</i>	buckbean - slender sedge	Blue
<i>Salix sitchensis</i> / <i>Carex sitchensis</i>	Sitka willow / Sitka sedge	Blue
<i>Salix sitchensis</i> - <i>Salix lasiandra</i> var. <i>lasiandra</i> / <i>Lysichiton americanus</i>	Sitka willow - Pacific willow / skunk cabbage	Blue
<i>Schoenoplectus acutus</i> Deep Marsh	hard-stemmed bulrush Deep Marsh	Blue
<i>Trichophorum cespitosum</i> / <i>Campylium stellatum</i>	tufted clubrush / golden star-moss	Blue

APPENDIX C - Forest Breakdown by Biogeoclimatic Zone

Rainbow-Jordan 240806 VRI ANALYSIS		
		Area (ha)
Rainbow Jordan		10,492.5
Total Treed (TC+TM+TB) *		7,251.0
Old Growth Forest	ICH	2,324.0
	ESSF	2,968.9
TOTAL		5,292.9
Young Forest	ICH	1,548.7
	ESSF	402.8
TOTAL		1,951.5
Non Treed		
Not Identified(lakes/water courses etc)		119.0
Bryoid	BY	0.0
Exposed Land	EL	28.5
Herb	HE	3.1
Herb - Forbs	HF	0.0
Rock / Rubble	RO	246.5
Snow / Ice	SI	482.2
Shrub Low	SL	941.2
Shrub Tall	ST	1,427.7
TOTAL		3,248.1
Timber Harvesting		6,649.9
Clearcuts (1967 -2023)		NIL
Ungulate Winter Range		
M-RATA-01 No Harvest - amended 2017		2,473.0
M-RATA-01 Restricted Harvest - amended 2017		0.0
TOTAL		2,473.0
Caribou federal HLER (designated under Sara)		4,467.8

** Treed Coniferous, Mixed and Broadleaf.

NOTE: TAP Old Growth

It would appear the TAP Old Growth dataset picks up **ALL** Age Class 7,8 or 9 in the latest VRI data. Some are within the "Non Treed" areas. The VRI definition of "Non Treed" areas is as follows:

A polygon is considered Non-Treed if less than 10% of the polygon area, by crown cover, consists of tree species of any size.

This analysis **does not** include polygons that capture Age Classes 7, 8 or 9 within the Non Treed polygons (ones that have less than 10% of their area, by crown closure, consisting of tree species of any size).

BGC Subzone Variant	TAP Old Growth (within Treed polygons)	TAP Old Growth (within Non Treed Polygons)	Actual TAP Old Growth
ESSFvc	248.8	13.5	235.4
ESSFwcd	0.0	0.0	0.0
ESSFwcw	0.7	9.0	-8.3
ICH vk	299.6	5.0	294.6
ICH wk	325.0	10.7	314.3
TOTAL	874.1	38.1	836.0



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In British Columbia, age class 7 forests are within 121 to 140 years of age. Age class 8 includes forest of 141 to 250 years, and age class 9 includes forest of 250 years or older. Age class 9 is the oldest classification, meaning that the province's remaining ancient trees, like the one above, are not properly accounted for. Aside from a number of individual trees recorded in the Big Tree Registry, these giants are treated the same as the trees over a thousand years younger.

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