Ecological Significance of the Children's Forest

Herbaceous sensitive ecosystem, with Wallace's selaginella/reindeer lichens *(Selaginella wallacei/ Cladina spp.)* blue-listed ecological community of special concern, being inventoried at Blitz Bluff in the Children's Forest.

Review prepared for the:
Forest Trust for the Children of Cortes Island Society (FTCCIS)

By:
Sabina Leader Mense/Professional Biologist
Eldron Consulting
Box 211 Whaletown, B.C. V0P 1Z0
250 935 6467 sabinaleader@gmail.com

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1.0 Prologue

For the purposes of this report, the lands referred to as the Children's Forest, occur on Cortes Island, B.C., in the traditional territories of the Klahoose, Tla'amin and Homalco First Nations.

These lands encompass the 252.5 hectares/624 acres, described in the B.C. Land Titles Office as:

NW ¼, Section 38, Cortes Island, Sayward District
NE ¼, Section 38, Cortes Island, Sayward District
NW ¼, Section 39, Cortes Island, Sayward District
NE ¼, Section 39, Cortes Island, Sayward District
NE ¼ of SW ¼, Section 38, Cortes Island, Sayward District

Island Timberlands Limited Partnership is identified as the present landholder.

These lands are ecologically significant;
this review summarizes the rationale behind this statement.

Blue dasher/ *Pachydiplax longipennis;* blue-listed species at risk in B.C., pausing to rest on foliage in a wetland sensitive ecosystem at the heart of the Children's Forest.

2.0 Cortes Island – the Context

For a comprehensive understanding of the ecological significance of the Children's Forest, one must initially step back and view these lands within the context of the island of Cortes, at both global and regional landscape levels.

Cortes Island is located within the coastal temperate rainforests of B.C.
Coastal temperate rainforests only ever represented one tenth of one percent of the Earth's forests and are considered a globally rare ecosystem.[1]
Coastal temperate rainforests are ecologically significant as the most carbon dense forests in the world with fifty percent of the carbon stored below ground, the most secure place for carbon to be stored.[2]

[1] Herb Hammond (Forest Ecologist), "personal communication", Apr. 7, 2022
[2] Suzanne Simard (UBC Professor of Forest Ecology), "personal communication", Apr. 7, 2022

Cortes Island is located in the Discovery Islands Archipelago, which forms a "bridge" between Mainland British Columbia and Vancouver Island.
Increasing interest from the scientific community, in this Archipelago, is being fuelled by new research into cryptic genetic diversity[3] and debates over the extent to which ecologically driven isolation or geographically driven isolation is the most important component of speciation. Research inquiries have been made over recent years wrt studies of our local populations of Ruffed Grouse *(Bonasa umbellus)*, Western Screech-owl *(Megascops kennicottii kennicottii),* newly described coastal Flying Squirrel *(Glaucomys oregonensis)* and Coastal Wolf *(Canis lupus).*

Cortes Island straddles the 50th parallel north, at the northern reaches of the Strait of Georgia. **This geographic location marks the transition between the Coastal Douglas-fir (CDF) and Coastal Western Hemlock (CWH) biogeoclimatic zones.[4]**

Cortes Island's transitional ecosystems harbour significant populations of species and ecological communities that are either at the northern edge of their range, eg. Douglas-fir *(Pseudotsuga menziesii)* & hairy manzanita *(Arctostaphylos columbiana)*, or at the southern edges of their range, eg. coastal western hemlock *(Pseudotsuga heterophylla)* community on the east side of Vancouver Island.
Cortes Island's intact transitional ecosystems are characterized by high habitat & high species diversity with good linkage across the landscape, providing the most resilience and adaptability in the face of climate change.
Transitional ecosystems can also provide habitat for cryptic species that are relatively unknown.

Within the spectrum of CWH subzones, Cortes Island occupies the driest end of the spectrum which is described as Coastal Western Hemlock xeric maritime 1 (CWHxm1).

CWHxm1 is a specialized niche with many rare ecosystem types identified and is therefore included in the Coastal Douglas-fir & Associated Ecosystems Conservation Partnership working boundary.[5] Cortes Island represents some of the largest remaining intact/undeveloped tracts of CWHxm1. Notably, the old forest stage of CWHxm1 is

[3] A. Espindola, M. Ruffley, M.L. Smith, B.C. Carstens, D.C. Tank, J. Sullivan, (2016). "Identifying cryptic diversity with predictive phylogeography" https://royalsocietypublishing.org/doi/10.1098/rspb.2016.1529
[4] Del Meidinger and Jim Pojar, *Ecosystems of British Columbia* (Victoria: Crown Publications, 1991)
[5] Coastal Douglas-fir & Associated Ecosystems Conservation Partnership https://www.cdfcp.ca/about-the-cdfcp/

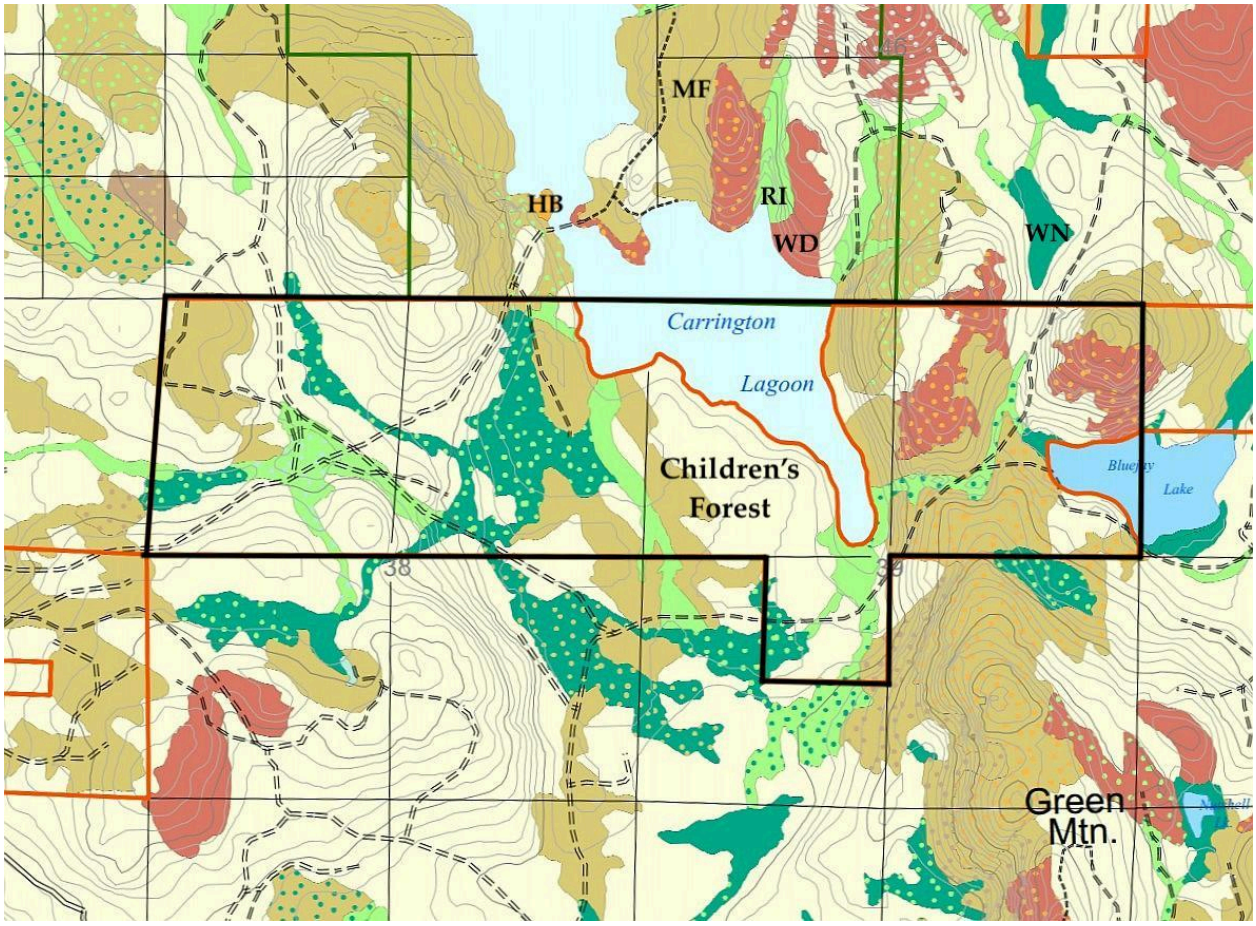
grossly under-represented in the protected land base.

3.0 Sensitive Ecosystems Inventory

Sensitive ecosystems are defined as those ecosystems which are fragile and/or rare, or those ecosystems which are ecologically important because of the diversity of species they support, i.e. high biological diversity.

From 1994-1999, Environment Canada and the BC Ministry of Sustainable Resource Management conducted the Sunshine Coast Sensitive Ecosystems Inventory (SEI), to identify rare and fragile terrestrial ecosystems along the eastern component of the Georgia Basin Lowlands; an ecological region unique in Canada that includes Cortes Island.[6]

This SEI highlights the wealth of sensitive ecosystems contained within the landscape of the Children's Forest; a complex tapestry including: Herbaceous (HB), Woodland (WD), Wetland (WN), Riparian (RI) and the provincially designated, other important ecosystem, Mature Forest (MF).



Annotated portion of, *SEI Mapping of Island Timberlands and Surrounding Terrain on Cortes Island*; map produced by CES & Woodlot Forestry Services Ltd. 2008

Herbaceous (HB) & Woodland (WD)

With regional climate change scenarios continuing to predict warmer & wetter winters and hotter & drier summers, our more drought resistant herbaceous and woodland communities will become increasingly important as refugia, for their adaptive

[6] Ministry of Environment, (1999). "Ecological Reports Catalogue: Sensitive Ecosystems Inventory of the Sunshine Coast and Adjacent Islands" https://a100.gov.bc.ca/pub/acat/public/viewReport.do?reportId=3758;

characteristics as drought events intensify. Blitz Bluff and Goat Mountain, in the NE ¼ Section 39, represent ecologically significant herbaceous/woodland complexes.

Wetland (WN)
In the drier maritime variants of the CWH, eg. CWHxm1, all classifications of wetlands are uncommon to rare and are therefore ecologically significant, providing important components of biodiversity, habitat and corresponding organisms supported.[7]
The wetland complex dominating the NE ¼ Section 38 is of note; forested swamp notably receiving special management under ecosystem-based management.

Riparian (RI)
James Creek forms the notable riparian sensitive ecosystem in the Children's Forest, running from the southwestern corner of the NW ¼ Section 39, along the eastern border of the NE ¼ Section 38 into Carrington Lagoon. This riparian class S3 stream, runs year-round with strong resident populations of B.C.'s blue-listed subspecies of special concern, the Cutthroat Trout *(Oncorhynchus clarkii clarkia)* and also boasts seasonal spawning Chum Salmon (*Onchorhynchus keta)* and Coho Salmon *(Oncorhynchus kisutch)*. James Creek represents the most intact and resilient salmonid stream, of the four currently productive salmonid streams on Cortes Island, and is therefore the present focus of DFO assisted enhancement projects.

Mature Forest (MF)
Noteworthy for functioning as buffers around the fragments/oases of sensitive ecosystems, Mature Forest reduces land fragmentation, providing landscape level connectivity for gene flow and wildlife travel corridors.

The Children's Forest mature second-growth forests also play an essential role in carbon sequestration and represent important "old-growth recruitment areas" that are beginning to contain some of the ecosystem features found in old-growth forests. Large, old veteran trees/Mother trees, actively sequestering the most carbon, are found scattered throughout the Children's Forest and represent remnants of former old-growth forests.

High Biodiversity Nodes

[7] B.C. Ministry of Forests, *Wetlands of British Columbia* (Victoria: Crown Publications, 2004).

Sensitive ecosystems delineate the fragments/oases of habitat that act as high biodiversity nodes, which are the strongholds for rare occurrences of species and ecological communities. Table 1. describes rare occurrences of species and ecological communities observed, to date, in the Children's Forest but by no means represents a complete list of all rare occurrences of species and ecological communities present.

Table 1. Rare Occurrences of Species and Ecological Communities[8]*

Species Name		Status				
English	Scientific	Provincial	BC List	COSEWIC	SARA	Global
Northern Goshawk	*Accipiter gentilis laingi*	S2 (2010)	Red	T	1-T (2003)	G5T2 (2016)
Northern Pygmy-owl	*Glaucidium gnoma swarthi*	S3S4 (2018)	Blue			G4G5T3T4Q (2019)
Common Nighthawk	*Chordeiles minor*	S3S5B (2022)	Blue	SC	1-SC (2023)	G5 (2016)
Great Blue Heron	*Ardea herodias fannini*	S3BS4N (2022)	Blue	SC	1-SC (2010)	G5T4 (2016)
Northern Red-legged Frog	*Rana aurora*	S3 (2022)	Blue	SC	1-SC (2005)	G4 (2015)
Band-tailed Pigeon	*Patagioenas fasciata*	S3S4	Blue	SC	1-SC (2011)	G4 (2016)
Little Brown Myotis	*Myotis lucifugus*	S3S4 (2022)	Blue	E	1-E (2014)	G3G4 (2021)
Threaded Vertigo	*Nearctula sp. 1*	S3 (2015)	Blue	SC	1-SC (2012)	G3G5 (2006)
Cutthroat Trout	*Oncorhynchus clarkii clarkii*	S3S4 (2004)	Blue			G5T4 (1997)
Blue Dasher	*Pachydiplax longipennis*	S3S4 (2015)	Blue			G5 (2015)

[8] B.C. Ministry of Water, Lands and Resource Stewardship, (2022). "Conservation Data Center Species and Ecosystems Explorer" http://a100.gov.bc.ca/pub/eswp/

Olive-sided Flycatcher	*Contopus cooperi*	S4B (2022)	Yellow	SC	1-SC (2023)	G4 (2016)
Sooty Grouse	*Dendragapus fuliginosus*	S4 (2015)	Yellow			G5 (2016)
Barn Swallow	*Hirundo rustica*	S4B (2022)	Yellow	SC	1-T (2017)	G5 (2016)
Pacific Sideband	*Monadenia fidelis*	S4 (2015)	Yellow			G4G5 (2002)

Ecological Community Name		**Status**		
English	Scientific	Provincial	BC List	Global
western hemlock/ western redcedar – deer fern	*Tsuga heterophylla – Thuja plicata/ Struthiopteris spicant*	S2 (2013)	Red	G2G3
western hemlock – Douglas-fir/ Oregon beaked-moss	*Tsuga heterophylla – Pseudotsuga menziesii/ Kindbergia oregana*	S2 (2013)	Red	G3G4
western redcedar/ slough sedge	*Thuja plicata/ Carex obnupta*	S2 (2021)	Red	GNR
Douglas-fir – western hemlock/ salal	*Pseudotsuga menziesii - Tsuga heterophylla/ Gaultheria shallon*	S2 (2019)	Red	G3G4
arbutus/ hairy manzanita	*Arbutus menziesii/ Arctostaphylos columbiana*	S1S2 (2021)	Red	G2
shore pine/ common juniper – hairy manzanita	*Pinus contorta var. contorta/ Juniperus communis – Arctostaphylos columbiana*	S1 (2011)	Red	GNR
western redcedar/ sword fern – skunk cabbage	*Thuja plicata/ Polystichum munitum – Lysichiton americanus*	S3? (2012)	Blue	GNR
western redcedar - Sitka spruce/ skunk cabbage	*Thuja plicata - Picea sitchensis/ Lysichiton americanus*	S3? (2004)	Blue	G3?
western redcedar/ three-leaved foamflower	*Thuja plicata/ Tiarella trifoliata*	S2S3 (2013)	Blue	G3

Wallace's selaginella / reindeer lichens	*Selaginella wallacei/ Cladina spp.*	S3 (2012)	Blue	GNR
Douglas-fir – lodgepole pine/ grey rock-moss	*Pseudotsuga menziesii – Pinus contorta var. contorta/ Racomitrium canescens*	S3S4 (2019)	Yellow	GNR

BC Conservation Data Center's conservation status ranking for ecological communities & species at risk:
Red – any species or ecological community at risk of being lost (extirpated, endangered or threatened)
Blue – any species or ecological community of special concern
Yellow – any species or ecological community at the least risk of being lost but warranting special attention

4.0 Research Initiatives

FTCCIS has a mandate to conduct objective, academic and scientific research. FTCCIS partners with individuals and institutions, in research to further the understanding of the broad spectrum of ecological components that contribute to the ecological significance of the Children's Forest.

Research initiatives 2014-2024 include but are not limited to:

- **Streamkeeper Training Workshops** and spawner counts 2014 to present – in partnership with Cortes Island Streamkeepers
- **BioBlitz 2016, 2017, 2018, & 2019**; intense 24 hour biological inventories of the Children's Forest in the spring of each year – in partnership with invited biological expertise from: RBCM, UVic, UBC, UofA, MWLRS, MOF, DFO, COS, Beaty Biodiversity Center and independent researchers & naturalists
  The Children's Forest Species Inventory 2020, represents the consolidation of this research data[9]
- **Bird Studies Canada** annual bird counts 2016 to present – in partnership with the Cortes Island Museum & Archives Society and citizen scientists
- **James Creek Restoration Project**; assessment 2018, mapping 2020, enhancement of chum salmon spawning habitat 2020, 2021 and ongoing - in partnership with DFO & Cortes Island Streamkeepers
- **Canadian Moss Monitoring Survey** 2020 – in partnership with bryologist Daniel Tucker
- **MycoBlitz 2020**; intense 24 hour fungal inventory of the Children's Forest – in partnership with Paul Stamets/ medicinal fungal entrepreneur & mycoremediation specialist
- **Western Screech-owl Inventory and Habitat Stewardship on Cortes Island**; active acoustic monitoring in the Children's Forest 2022 & 2023 – in partnership

[9] Sabina Leader Mense, (2020). "Children's Forest Species Inventory" https://www.corteschildrensforesttrust.org/research/species-inventory/

with Pacific Megascops Research Alliance & Ministry of Water, Land and Resource Stewardship
- **Coastal Wolf Genetics Project**; DNA collection 2023 – in partnership with Shelley Marshall/ Senior Wildlife Biologist, Ministry of Forests

...forthcoming
- **MycoBlitz 2023;** intense 24 hour fungal inventory of the Children's Forest – in partnership with Andy MacKinnon/mycologist & forest ecologist and Paul Stamets/ medicinal fungal entrepreneur & mycoremediation specialist
- **BioBlitz 2024**; intense 24 hour terrestrial floral inventory of the Children's Forest – in partnership with Tara Martin & students/ Conservation Decisions Lab UBC

5.0 Connectivity Conservation

Formal protection of areas forms the bedrock of conservation but equally important are the connections between and among protected areas; i.e. ecological connectivity.
The science of connectivity conservation is a direct countermeasure to the fragmentation of land, helping stave off biodiversity loss and increase nature's resilience to climate change.[10]

Conservation of the Children's Forest (252.5ha/624ac), which borders Carrington Bay Park (351ha/868ac) immediately to the north, is an intentional act to ensure landscape level ecological networks remain intact.

These ecological networks maintain the integrity of a cross-island biodiversity linkage that is extensively used as wildlife corridors by Columbian black-tailed deer *(Odocoileus hemionus columbianus)* and both gray wolf *(Canis lupus)* and cougar *(Puma concolor).* It is uncommon in the islands of the Strait of Georgia for healthy, large predator-prey relationships to still exist, making these protected landscapes ecologically significant.

[10] Connectivity Conservation Specialist Group https://conservationcorridor.org/ccsg/resources/connectivity-conservation/#:~:text=CCSG%20defines%20connectivity%20conservation%20as,across%20intact%20and%20fragmented%20environments.

Cortes Island coastal wolf *(Canis lupus)* photographed in an important wildlife corridor.

6.0 Epilogue

FTCCIS is pursuing the purchase of the Children's Forest, in order to place these lands "in trust" to future generations of children.
Upon purchase of the Children's Forest, FTCCIS will be registering a conservation covenant under a 219 Land Title Act, on title to the land, which will be the conservation tool employed to provide long term protection of the lands, i.e. in perpetuity.

This act of landscape level conservation, during one of human history's most dramatic changes in climate, is one of the most proactive measures that can be taken to enhance the resilience of these lands in supporting and maintaining their exceptional ecological significance, well into the future. *Imagine... a forest in trust to the children!*

BioBlitz 2019; Cortes Island youth inventory herbaceous bryophyte communities.