

APPENDIX B

Data Layer Types And Sources for Targeted Ecosystem Services (updated March 2023)

(from suggestions made during in-depth interviews undertaken between January and September 2023, and in written feedback)

DATA LAYER TYPE	POSSIBLE DATA SOURCES	ECOSYSTEM SERVICE REPRESENTED/DERIVED					
		Biodiversity	Carbon Mitigation		Culturally Significant Ecosystems <i>(only as defined by and with First Nations consent)</i>	Watershed Resilience	Wildfire Resilience
			Storage	Sequestration			
SEARCHABLE BC DATA CATALOGUES							
<ul style="list-style-type: none"> • Various 	<ul style="list-style-type: none"> • BC Data Catalogue https://catalogue.data.gov.bc.ca/ • EcoCat Ecological Reports Catalogue https://www2.gov.bc.ca/gov/content/environment/research-monitoring-reporting/libraries-publication-catalogues/ecocat • iMap BC https://www2.gov.bc.ca/gov/content/data/geographic-data-services/web-based-mapping/imapbc • Habitat Wizard https://www2.gov.bc.ca/gov/content/environment/plants-animals-ecosystems/ecosystems/habitatwizard • 	<ul style="list-style-type: none"> • Wide range of B.C. Government data, applications and web services • Maps, datasets and published inventories on aquatic species and habitats, terrestrial species and habitats, and vegetation. 	<ul style="list-style-type: none"> • Wide range of B.C. Government data, applications and web services 	<ul style="list-style-type: none"> • Wide range of B.C. Government data, applications and web services 	<ul style="list-style-type: none"> • Wide range of B.C. Government data, applications and web services 	<ul style="list-style-type: none"> • Wide range of B.C. Government data, applications and web services • Maps, datasets and published inventories on aquatic species, floodplain mapping, reservoirs, ground water 	<ul style="list-style-type: none"> • Wide range of B.C. Government data, applications and web services •
LAND COVER							
<ul style="list-style-type: none"> • Land Cover & change 	<ul style="list-style-type: none"> • Lidar <ul style="list-style-type: none"> ○ https://www2.gov.bc.ca/gov/content/data/geographic-data-services/lidarbc ○ https://open.canada.ca/data/en/dataset/957782bf-847c-4644-a757-e383c0057995 • Satellite imagery • Orthophotos 	<ul style="list-style-type: none"> • Regional baseline conditions. • Ecosystem conversion rates/human footprint • Monitoring land use changes • Overall ecological resilience (amount and contiguity of 	<ul style="list-style-type: none"> • Baseline conditions • Conversion rates 	<ul style="list-style-type: none"> • Baseline conditions • Conversion rates 	<ul style="list-style-type: none"> • Cumulative impacts on traditional territories and Aboriginal Rights 	<ul style="list-style-type: none"> • Overall watershed health/run-off moderation • Hydrological/watershed modelling 	<ul style="list-style-type: none"> •

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		Biodiversity	Carbon Mitigation		Culturally Significant Ecosystems <i>(only as defined by and with First Nations consent)</i>	Watershed Resilience	Wildfire Resilience
			Storage	Sequestration			
	<ul style="list-style-type: none"> ● North American Land Cover (NALCMS) & Land Cover Change (2010-2015) (30m pixels) ● Satellite Forest Information For Canada (30m) https://opendata.nfis.org/mapserver/nfis-change_eng.html <ul style="list-style-type: none"> ○ Landcover ○ Agricultural/forest land cover ● UN Biodiversity Lab <ul style="list-style-type: none"> ○ ESA CCI Land Cover 1992-2000 (300m pixels) ○ ESA CGLS Land Cover 2015-2019 (100m pixels) ○ Esri 2020 Land Cover 10m ● Agriculture Canada (AAFC) semi-decadal land use time series ● Trends Earth Tracking Land Change – Land cover (QGIS download) – 1992-2018 (300m) ● Joint Ventures BC Land Cover Map (not public) ● UBC Sustainable Agriculture Landscapes Lab – Land use-land Cover Change in Lower Fraser Valley 1978-2018 (30m) https://sal-lab.landfood.ubc.ca/projects/spatio-temporal-analysis-of-land-use-land-cover-and-soil-organic-carbon-in-lower-fraser-valley/ 	<ul style="list-style-type: none"> remaining natural habitat. ● Ecological corridors and stepping stones ● Land cover diversity 					
VEGETATION COVER / ECOSYSTEMS	POSSIBLE DATA SOURCES	BIODIVERSITY	CARBON STORAGE	CARBON SEQUESTRATION	CULTURALLY SIGNIFICANT ECOSYSTEMS	WATERSHED RESILIENCE	WILDFIRE RESILIENCE

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		Biodiversity	Carbon Mitigation		Culturally Significant Ecosystems <i>(only as defined by and with First Nations consent)</i>	Watershed Resilience	Wildfire Resilience
			Storage	Sequestration			
<ul style="list-style-type: none"> Terrestrial Ecosystems 	<ul style="list-style-type: none"> TEM/BEC site series, VRI SEI Analogs (bird guilds, animal models) Lidar/multispectral <ul style="list-style-type: none"> https://www2.gov.bc.ca/gov/content/data/geographic-data-services/lidarbc https://open.canada.ca/data/en/dataset/957782bf-847c-4644-a757-e383c0057995 Marxan (CDFCP mapping layers) Islands Trust Contiguous Forest Cover Mapping Parks Canada Mapping WWF Max canopy height in Canada 2019 (250m) https://data.4tu.nl/collections/15421810/3 Biodiversity Lab – global intertidal change Global Forest Change 2000-21 (30m); Global Land Analysis & Discovery, derived from https://www.science.org/doi/10.1126/science.1244693 Satellite Forest Information For Canada (30m) https://opendata.nfis.org/mapserver/nfis-change_eng.html <ul style="list-style-type: none"> Forest change and change type 	<ul style="list-style-type: none"> Sensitive ecosystems Priorities for retention or restoration:(e.g. Garry oak meadows, wetlands, woodlands, riparian areas, etc.). Freshwater fish habitat Habitat for species at risk Ecological corridors and stepping stones Priority restoration areas (to link up larger ecosystem patches and reduce ecosystem fragmentation) 	<ul style="list-style-type: none"> Cross walk with carbon valuation models for each ecosystem type to determine priority retention and restoration areas Heights, BA, CC, SPH info can be highly improved with LiDAR 	<ul style="list-style-type: none"> Cross walk with carbon valuation models for each ecosystem type to determine priority retention and restoration areas 	<ul style="list-style-type: none"> Ecosystems that potentially support culturally important plants (e.g. camas, cedar, sitka spruce, devils club, etc.) Habitats that potentially support culturally important wildlife Priorities for retention and cultural restoration/ management 	<ul style="list-style-type: none"> Watershed health/run-off moderation (e.g % forest cover) Hydrologically sensitive ecosystems (wetlands, riparian areas, floodplain systems, etc.) Hydrological/watershed modelling Priority retention and restoration areas (e.g. riparian areas, wetlands, floodplains) 	<ul style="list-style-type: none"> Forest types at higher (eg dry conifer) vs lower (e.g. broadleaf) fire risk

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			Storage	Sequestration			
<ul style="list-style-type: none"> Ecosystem Productivity 	<ul style="list-style-type: none"> VRI (site index), Provincial Site Productivity Layer 	<ul style="list-style-type: none"> Site productivity – how fast vegetation grows, and how big it gets Priorities for retention/restoration (e.g. productive 'big tree' old growth, estuaries) 	<ul style="list-style-type: none"> Capability of ecosystem to store carbon. Priorities for retention (i.e. ecosystems currently storing high amounts of carbon) Priorities for restoration (degraded ecosystems on productive sites, capable of storing high amounts of carbon in the future) 	<ul style="list-style-type: none"> Capability of ecosystem to sequester carbon. Priorities for retention (ecosystems sequestering high carbon at high rates) Priorities for restoration (degraded ecosystems on productive sites, capable of sequestering at high rates in the future) 	<ul style="list-style-type: none"> Priority cultural plant areas for retention and restoration (e.g. productive sites capable of growing monumental cedars) 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> Can higher productivity forests be used as an indicator of fire resilience?
<ul style="list-style-type: none"> Forest Structural Stage/Integrity 	<ul style="list-style-type: none"> Vegetation Resource Inventory (VRI) Lidar/multispectral <ul style="list-style-type: none"> https://www2.gov.bc.ca/gov/content/data/geographic-data-services/lidarbc https://open.canada.ca/data/en/dataset/957782bf-847c-4644-a757-e383c0057995 Analogs:(bird guilds, animal models) Satellite Forest Information For Canada (30m) <ul style="list-style-type: none"> https://opendata.nfis.org/mapserv/r/nfis-change_eng.html <ul style="list-style-type: none"> Wildfire year Harvest year Post disturbance recovery Forest elevation height Basal area Urban Greenness score 	<ul style="list-style-type: none"> Sensitive/priority areas for retention (e.g. old and mature forest) Ecological corridors/connectivity Forest integrity/condition and change in integrity Old/mature forest climate refugia (shadier/lower temperatures) 	<ul style="list-style-type: none"> Cross walk with carbon valuation models for each structural stage, to determine priority areas for retention, restoration, or improved management 	<ul style="list-style-type: none"> Cross walk with carbon valuation models for each structural stage, to determine priority areas for retention, restoration, or improved management 	<ul style="list-style-type: none"> Potential cultural plant areas (e.g. large cedars for canoe building) 	<ul style="list-style-type: none"> Hydrological/watershed modelling Hydrologically sensitive areas, e.g. <ul style="list-style-type: none"> old forest in watershed headwaters (affects water flows via snowpack accumulation and melting rates) Old and mature forest in riparian areas , floodplains, alluvial fans,, etc.(affects water flows and quality) Shade from old/mature forest lowers water temperatures 	<ul style="list-style-type: none"> Forest stages at higher risk (e.g. dense pole sapling) vs lower fire risk (e.g. mature-old with separated crowns, uneven age)

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			Storage	Sequestration			
	<ul style="list-style-type: none"> ○ And more ● Canadian Forest Service forest disturbance mapping 1984-2015 (30m) https://open.canada.ca/data/en/dataset/add1346b-f632-4eb9-a83d-a662b38655ad ● Global Forest Height 2019 (30m); Global Land Analysis & Discovery https://glad.umd.edu/dataset/gedi/ ● UN Biodiversity Lab – <ul style="list-style-type: none"> ○ Forest Landscape Integrity Index (300m) ● Global Forest Change 2000-21 (30m); Global Land Analysis & Discovery, derived from https://www.science.org/doi/10.1126/science.1244693 					<ul style="list-style-type: none"> ● Priority retention areas 	
Biodiversity	<ul style="list-style-type: none"> ● UN Biodiversity Lab – Biodiversity intactness Index (2000-2015) http://unbiodiversitylab.org/en/ ● iBird ● iNaturalist ● Key Biodiversity Areas https://www.keybiodiversityareas.org/kba-data ● Important Bird Areas https://www.ibacanada.com/explore_how.jsp?lang=en ● Composite distribution maps used for CDFCP Marxan and NPLCC Tool, https://ncc.carleton.ca/app/wheretowork_advanced?sp_hide_navbar=true <ul style="list-style-type: none"> ○ Old Forest communities ○ Savannah communities ○ Wetland communities ○ Shrub communities ○ Beta biodiversity 	<ul style="list-style-type: none"> ● Biodiverse ecological communities ● Species diversity and richness ● Globally & nationally significant populations/aggregations ● Ecosystem diversity ● Biodiversity intactness; ● Forest integrity; ● Human footprint ● Land cover diversity ● Priorities for retention, management and restoration 					

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			Storage	Sequestration			
SPECIES & ECOSYSTEMS AT RISK	POSSIBLE DATA SOURCES	BIODIVERSITY	CARBON STORAGE	CARBON SEQUESTRATION	CULTURALLY SIGNIFICANT ECOSYSTEMS	WATERSHED RESILIENCE	WILDFIRE RESILIENCE
<ul style="list-style-type: none"> • Species at risk 	<ul style="list-style-type: none"> • CDC element occurrences <ul style="list-style-type: none"> ○ http://maps.gov.bc.ca/ess/hm/cdc/ ○ https://www2.gov.bc.ca/gov/content/environment/plants-animals-ecosystems/conservation-data-centre/explore-cdc-data/species-and-ecosystems-explorer • First Nations/local knowledge • Goshawk models, nesting and foraging habitat maps • Marbled Murrelet models and suitability mapping • W. Screech owl models under development • Composite distribution maps used for CDFCP Marxan and NPLCC Tool, https://ncc.carleton.ca/app/wheretowork_advanced?sp_hide_navbar=true <ul style="list-style-type: none"> ○ Old Forest communities ○ Savannah communities ○ Wetland communities • iNaturalist • iBird • Federal Species at Risk Range Maps • BC Reptile & Amphibian Range maps • CRD potential sharp-tailed snake habitat • Biodiversity Lab – Threatened Species Richness/Rarity/ http://unbiodiversitylab.org/en/ 	<ul style="list-style-type: none"> • Known records of species at risk • Potential habitat for species at risk • Priority areas for retention, restoration and management 	•	•	<ul style="list-style-type: none"> • Cultural hunting considerations? 	•	•

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			Storage	Sequestration			
<ul style="list-style-type: none"> Ecological communities at risk 	<ul style="list-style-type: none"> CDC element occurrences <ul style="list-style-type: none"> http://maps.gov.bc.ca/ess/hm/cdc/ https://www2.gov.bc.ca/gov/content/environment/plants-animals-ecosystems/conservation-data-centre/explore-cdc-data/species-and-ecosystems-explorer TEM CWHXm1 TEM project Garry Oak mapping SEI PEM Garry Oak TEM data 	<ul style="list-style-type: none"> Known locations of ecological communities at risk Likely occurrences of ecological communities at risk (e.g. extrapolated from TEM polygons) Priority areas for retention/ restoration/ management 	•	•	<ul style="list-style-type: none"> Potential culturally important plants Priority areas for retention/ cultural restoration/ management 	•	•
<ul style="list-style-type: none"> Critical Habitat 	<ul style="list-style-type: none"> Federal species at risk Critical Habitat maps https://catalogue.data.gov.bc.ca/dataset/critical-habitat-for-federally-listed-species-at-risk-posted- 	<ul style="list-style-type: none"> Critical habitat for species at risk, as mapped by the Federal Government Priority areas for retention/ restoration/ management 	•	•	•	•	•
REGIONALLY SIGNIFICANT FISH & WILDLIFE	POSSIBLE DATA SOURCES	BIODIVERSITY	CARBON STORAGE	CARBON SEQUESTRATION	CULTURALLY SIGNIFICANT ECOSYSTEMS	WATERSHED RESILIENCE	WILDFIRE RESILIENCE
<ul style="list-style-type: none"> Fish sensitive areas 	<ul style="list-style-type: none"> Fish observations Freshwater Atlas (fish bearing streams) Pacific Salmon Foundation Salmon Explorer; https://www.salmonexplorer.ca/#!/vancouver-island-mainland-inlets First Nations/local knowledge CMN-Fraser Valley Watershed Atlas 	<ul style="list-style-type: none"> Fishbearing streams and water bodies, Streams feeding into fishbearing streams Priority areas for retention/ restoration/ management 	•	•	<ul style="list-style-type: none"> Important fishery streams/sites Priority areas for retention/ cultural restoration/ management 	<ul style="list-style-type: none"> Priority areas for retention/ restoration/ management 	•

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			Storage	Sequestration			
	https://cmnbc.ca/atlasgallery/fraser-valley-watersheds-atlas/ <ul style="list-style-type: none"> Fisheries Information Summary System (FISS) https://cmnbc.ca/atlasgallery/fisheries-information-summary-system-data-entry-tool/ 						
<ul style="list-style-type: none"> Ungulate sensitive areas (winter range etc.) 	<ul style="list-style-type: none"> Ungulate winter range maps; First nations and local knowledge FLNRORD Deer and Elk models (TEM) 	<ul style="list-style-type: none"> Important ungulate habitat and movement corridors Priority areas for retention/ restoration/ management 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> Important game areas Priority areas for retention/ cultural restoration/ management 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none">
<ul style="list-style-type: none"> Important Bird Areas 	<ul style="list-style-type: none"> IBA Canada Important Bird Areas map 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none">
ESTUARINE/ INTERTIDAL SYSTEMS	POSSIBLE DATA SOURCES	BIODIVERSITY	CARBON STORAGE	CARBON SEQUESTRATION	CULTURALLY SIGNIFICANT ECOSYSTEMS	WATERSHED RESILIENCE	WILDFIRE RESILIENCE
<ul style="list-style-type: none"> Estuaries 	<ul style="list-style-type: none"> PECP Ranked estuaries https://pacificbirds.org/2021/02/an-updated-ranking-of-british-columbias-estuaries/ BEC site series TEM/ SEI in some places Georgia Basin Habitat Atlas (lower mainland tidal habitat) https://cmnmaps.ca/GBHA/ 	<ul style="list-style-type: none"> Sensitive ecosystems Important fish and wildlife habitat Important bird areas Biodiversity hotspots Priority habitats for retention/ restoration/management 	<ul style="list-style-type: none"> Productive sites with high carbon storage capability Cross walk with carbon valuation models for each ecosystem type to determine priority retention and restoration areas 	<ul style="list-style-type: none"> Productive sites with high carbon sequestration capability Cross walk with carbon valuation models for each ecosystem type to determine priority retention and restoration areas 	<ul style="list-style-type: none"> Estuaries and associated marshes support culturally important plants (e.g. springbank clover, silverweed) Sensitive salmon habitat Sensitive wildlife habitat Priority areas for retention/ cultural restoration/management 	<ul style="list-style-type: none"> Crosswalk with ecosystem service valuations (flood control, water quality & quantity, etc.), to determine priority areas for retention/ restoration/management 	<ul style="list-style-type: none">

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			Storage	Sequestration			
<ul style="list-style-type: none"> Intertidal 	<ul style="list-style-type: none"> ShoreZone (high resolution imagery & video) SEI mapping CMN – BC Eelgrass Inventory UN Biodiversity Lab – Global Distribution of Seagrasses BCMCA: Marine Atlas of Pacific Canada (2011) https://cmnbc.ca/atlasgallery/bc-marine-conservation-analysis-atlas/ Georgia Basin Habitat Atlas (lower mainland eelgrass & tidal habitat) https://cmnmaps.ca/GBHA/ 	<ul style="list-style-type: none"> Sensitive ecosystems Important intertidal habitat Important fish habitat Biodiversity hotspots Priority habitats for retention/restoration/management 	<ul style="list-style-type: none"> Productive sites with high carbon storage capability Cross walk with carbon valuation models for each ecosystem type to determine priority retention and restoration areas 	<ul style="list-style-type: none"> Productive sites with high carbon sequestration capability Cross walk with carbon valuation models for each ecosystem type to determine priority retention and restoration areas 	<ul style="list-style-type: none"> Clam gardens Fish traps Sensitive aquaculture areas Priority areas for retention/ cultural restoration/management 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none">
HYDROLOGY, TOPOGRAPHY & TERRAIN	POSSIBLE DATA SOURCES	BIODIVERSITY	CARBON STORAGE	CARBON SEQUESTRATION	CULTURALLY SIGNIFICANT ECOSYSTEMS	WATERSHED RESILIENCE	WILDFIRE RESILIENCE
<ul style="list-style-type: none"> Watersheds 	<ul style="list-style-type: none"> Freshwater Atlas- watershed boundaries PSF Salmon Explorer Lidar (topography) <ul style="list-style-type: none"> https://www2.gov.bc.ca/gov/content/data/geographic-data-services/lidarbc https://open.canada.ca/data/en/dataset/957782bf-847c-4644-a757-e383c0057995 Topography/contour mapping CMN – Aquatic Information Partnership Atlas - Watershed statistics https://cmnmaps.ca/AIP/ 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> Watershed boundaries 	<ul style="list-style-type: none">

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			Storage	Sequestration			
<ul style="list-style-type: none"> • Terrain stability 	<ul style="list-style-type: none"> • Terrain stability mapping • Terrain hazard mapping 	•	•	•	•	<ul style="list-style-type: none"> • Areas vulnerable to erosion and landslides. 	•
<ul style="list-style-type: none"> • Floodplains/fluvial deposits 	<ul style="list-style-type: none"> • Terrain mapping, • BEC site series ? • Lidar (drainage) <ul style="list-style-type: none"> ○ https://www2.gov.bc.ca/gov/content/data/geographic-data-services/lidarbc ○ https://open.canada.ca/data/en/dataset/957782bf-847c-4644-a757-e383c0057995 • Province wide flood plain maps (Pre-1998, many do not account for climate change):https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/drought-flooding-dikes-dams/integrated-flood-hazard-management/flood-hazard-land-use-management/floodplain-mapping/floodplain-maps-by-region • Regional Districts' flood plain mapping, e.g.: <ul style="list-style-type: none"> ○ Cowichan Valley regional district:https://www.cvrd.ca/DocumentCenter/View/100315/2021-04-21---Schedule-O---Floodplain-and-Dam-Maps ○ Squamish: https://squamish.ca/assets/IFHMP/1117/5dbb51bad9/20171031-FINAL_IFHMP_FinalReport-compressed.pdf 	<ul style="list-style-type: none"> • Rare and sensitive ecosystems • Important fish and wildlife habitat • Biodiversity hotspots • Climate refugia • Priority habitats for retention/restoration/management 	<ul style="list-style-type: none"> • Productive sites with high carbon storage capability • Cross walk with carbon valuation models for each ecosystem type to determine priority retention and restoration areas 	<ul style="list-style-type: none"> • Productive sites with high carbon sequestration capability • Cross walk with carbon valuation models for each ecosystem type to determine priority retention and restoration areas 	<ul style="list-style-type: none"> • Areas likely to support culturally important plant areas (e.g. cedar, salmonberry, spruce, springbank clover) • Priority areas for retention/ cultural restoration/management 	<ul style="list-style-type: none"> • Hydrologically sensitive areas (store groundwater water, affect water flows and quality) • Sensitive ground water areas • Crosswalk with ecosystem service valuations (flood control, water quality & quantity, etc.), to determine priority areas for retention/restoration/management • Areas vulnerable to erosion 	<ul style="list-style-type: none"> • Wetter microclimate with lower fire risk • Fire break (more broad leaf trees)

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			Storage	Sequestration			
<ul style="list-style-type: none"> Riparian ecosystems 	<ul style="list-style-type: none"> TEM/BEC site series SEI FWA buffer Joint Ventures-TNT Topographic Riparian Area mapping 	<ul style="list-style-type: none"> Rare and sensitive ecosystems Important fish and wildlife habitat and corridors Climate refugia Biodiversity hotspots Priority habitats for retention/restoration/management Large woody debris recruitment (fish habitat) 	<ul style="list-style-type: none"> Productive sites with high carbon storage capability Cross walk with carbon valuation models for each ecosystem type to determine priority retention and restoration areas 	<ul style="list-style-type: none"> Productive sites with high carbon sequestration capability Cross walk with carbon valuation models for each ecosystem type to determine priority retention and restoration areas 	<ul style="list-style-type: none"> Areas likely to support culturally important plants (e.g. cedar, elder, mock orange, saskatoons) Priority areas for retention/ cultural restoration/management 	<ul style="list-style-type: none"> Hydrologically sensitive areas (store groundwater water, affect water flows and quality, reduce water temperature) Crosswalk with ecosystem service valuations (flood control, water quality & quantity, etc.), to determine priority areas for retention/restoration/management 	<ul style="list-style-type: none"> Wetter microclimate with lower fire risk Fire break (more broad leaf trees)
<ul style="list-style-type: none"> Wetlands & lakes 	<ul style="list-style-type: none"> Freshwater Atlas, TEM/BEC site series CWS ranked wetlands 2018 CWS National Wetland Inventory (under development) Satellite Forest Information For Canada - wetlands (30m) https://opendata.nfis.org/mapserv/r/nfis-change_eng.html Georgia Basin Habitat Atlas (lower mainland/ Fraser Valley wetlands) https://cmnmaps.ca/GBHA/ 	<ul style="list-style-type: none"> Rare and sensitive ecosystems Important fish and wildlife habitat Climate refugia Biodiversity hotspots Priority habitats for retention/restoration/management Important bird areas 	<ul style="list-style-type: none"> Sites with high carbon storage capability (e.g. wetlands) Cross walk with carbon valuation models for each ecosystem type to determine priority retention and restoration areas 	<ul style="list-style-type: none"> Ecosystems with high carbon sequestration capability (wetlands with tree canopies) Cross walk with carbon valuation models for each ecosystem type to determine priority retention and restoration areas 	<ul style="list-style-type: none"> Sensitive fish habitat Areas likely to support culturally important plants (e.g. springbank clover, silverweed, Labrador tea) Sensitive wildlife habitat Priority areas for retention/ cultural restoration/management 	<ul style="list-style-type: none"> Hydrologically sensitive areas (store water, affect water flows and quality) Crosswalk with ecosystem service valuations (flood control, water quality & quantity, etc.), to determine priority areas for retention/restoration/management 	<ul style="list-style-type: none"> Wetter microclimate with lower fire risk Fire break
<ul style="list-style-type: none"> Watercourses 	<ul style="list-style-type: none"> Freshwater Atlas CMN-Fraser Valley Watershed Atlas Lidar (drainage) <ul style="list-style-type: none"> https://www2.gov.bc.ca/gov/content/data/geographic-data-services/lidarbc https://open.canada.ca/data/en/dataset/957782bf-847c-4644-a757-e383c0057995 	<ul style="list-style-type: none"> Sensitive ecosystems Important fish and wildlife habitat Biodiversity hotspots Priority habitats for retention/restoration/management Climate refugia 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> Sensitive fish habitat Priority areas for retention/ cultural restoration/management 	<ul style="list-style-type: none"> Hydrologically sensitive areas (affect water flow and quality) Crosswalk with ecosystem service valuations (flood control, water quality & quantity, etc.), to determine priority 	<ul style="list-style-type: none"> Create wetter microclimates with lower fire risk Fire break

DATA LAYER TYPE	POSSIBLE DATA SOURCES	ECOSYSTEM SERVICE REPRESENTED/DERIVED					
		Biodiversity	Carbon Mitigation		Culturally Significant Ecosystems <i>(only as defined by and with First Nations consent)</i>	Watershed Resilience	Wildfire Resilience
			Storage	Sequestration			
	<ul style="list-style-type: none"> • 					<ul style="list-style-type: none"> • areas for retention/restoration/management 	
<ul style="list-style-type: none"> • Gullies 	<ul style="list-style-type: none"> • BEC site series, • Lidar (drainage) <ul style="list-style-type: none"> ○ https://www2.gov.bc.ca/gov/content/data/geographic-data-services/lidarbc ○ https://open.canada.ca/data/en/dataset/957782bf-847c-4644-a757-e383c0057995 • 	<ul style="list-style-type: none"> • Sensitive ecosystems • Important wildlife habitat and corridors • Priority habitats for retention/restoration/management • Climate refugia 	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • Areas likely to support culturally important plants (e.g. devil's club, red cedar) 	<ul style="list-style-type: none"> • Sensitive terrain feature, vulnerable to erosion and landslides. • Sediment recruitment and transport 	<ul style="list-style-type: none"> • Wetter microclimate with lower fire risk • Fire break (more broad leaf trees)
<ul style="list-style-type: none"> • Alluvial Fans 	<ul style="list-style-type: none"> • TEM, BEC site series, • Terrain mapping • Lidar (drainage) <ul style="list-style-type: none"> ○ https://www2.gov.bc.ca/gov/content/data/geographic-data-services/lidarbc ○ https://open.canada.ca/data/en/dataset/957782bf-847c-4644-a757-e383c0057995 • 	<ul style="list-style-type: none"> • Rare and sensitive ecosystems • Important wildlife habitat • Biodiversity hotspots • Climate refugia • Priority habitats for retention/restoration/management • Important sediment recruitment processes affecting fish and benthic invertebrates 	<ul style="list-style-type: none"> • Productive sites with high carbon storage capability • Cross walk with carbon valuation models for each ecosystem type to determine priority retention and restoration areas 	<ul style="list-style-type: none"> • Productive sites with high carbon sequestration capability • Cross walk with carbon valuation models for each ecosystem type to determine priority retention and restoration areas 	<ul style="list-style-type: none"> • Areas likely to support culturally important plants (e.g. spruce, berries) 	<ul style="list-style-type: none"> • Hydrologically sensitive areas (store groundwater, affect water flow and quality) • Highly erodible terrain • Sediment deposition 	<ul style="list-style-type: none"> • Wetter microclimate with lower fire risk • Fire break (more broad leaf trees)
<ul style="list-style-type: none"> • Small headwater streams 	<ul style="list-style-type: none"> • Freshwater Atlas - Stream Order 	<ul style="list-style-type: none"> • Important organic matter recruitment and transport area for downstream fish and aquatic invertebrates • Important aquatic invertebrate habitat 	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • Areas likely to support culturally important plants (e.g. devil's club, salmonberry) 	<ul style="list-style-type: none"> • Hydrologically sensitive areas (affect water flow and quality, affect downstream water temperature) • Sediment recruitment and transport 	<ul style="list-style-type: none"> • Wetter microclimate with lower fire risk • Fire break (more broad leaf trees)

DATA LAYER TYPE	POSSIBLE DATA SOURCES	ECOSYSTEM SERVICE REPRESENTED/DERIVED					
		Biodiversity	Carbon Mitigation		Culturally Significant Ecosystems <i>(only as defined by and with First Nations consent)</i>	Watershed Resilience	Wildfire Resilience
			Storage	Sequestration			
<ul style="list-style-type: none"> Groundwater recharge areas 	<ul style="list-style-type: none"> Islands Trust Groundwater Recharge Mapping https://islandstrust.bc.ca/wp-content/uploads/2021/02/2019-17-gws-ssi_groundwater-recharge_final.pdf 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> Hydrologically sensitive areas (recharge and store groundwater) 	<ul style="list-style-type: none">
<ul style="list-style-type: none"> Karst landscapes 	<ul style="list-style-type: none"> BEC site series Bedrock geology Provincial Karst Dataset 	<ul style="list-style-type: none"> productive forests climate refugia Rare cave fauna 	<ul style="list-style-type: none"> High carbon storage areas 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> Hydrologically sensitive areas (store groundwater, affect water flow and quality) 	<ul style="list-style-type: none">
<ul style="list-style-type: none"> Water quality 	<ul style="list-style-type: none"> Salish Sea Marine Emissions Tool Government of Canada Pollutants Affecting Whales and their Prey Inventory Tool (PAWPIT-OIPABP) 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none">
CULTURAL NATURAL ASSETS	POSSIBLE DATA SOURCES	BIODIVERSITY	CARBON STORAGE	CARBON SEQUESTRATION	CULTURALLY SIGNIFICANT ECOSYSTEMS	WATERSHED RESILIENCE	WILDFIRE RESILIENCE
<ul style="list-style-type: none"> Culturally important ecosystems 	<ul style="list-style-type: none"> First Nations/local knowledge AOA data (not public) Musqueam Place Names Map Stó:lō Research & Resource Management Centre TEM/SEI CDC ecological communities at risk mapping IMERSS & WhiteSwan ecocultural mapping pilot https://imerss.org/2019/01/01/ecocultural-mapping-pilot/ 	<ul style="list-style-type: none"> Fish, game and cultural plants Ecological communities at risk that are enhanced/restored by traditional management practices (including many at risk CDF ecosystems) Priority areas for retention and traditional management/restoration 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> Areas supporting or likely to support culturally important plants and animals. Priority areas for retention/ cultural restoration/management 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> Areas traditionally thinned and burned for food production (reduced fire risk)

DATA LAYER TYPE	POSSIBLE DATA SOURCES	ECOSYSTEM SERVICE REPRESENTED/DERIVED					
		Biodiversity	Carbon Mitigation		Culturally Significant Ecosystems <i>(only as defined by and with First Nations consent)</i>	Watershed Resilience	Wildfire Resilience
			Storage	Sequestration			
DISTURBANCE	POSSIBLE DATA SOURCES	BIODIVERSITY	CARBON STORAGE	CARBON SEQUESTRATION	CULTURALLY SIGNIFICANT ECOSYSTEMS	WATERSHED RESILIENCE	WILDFIRE RESILIENCE
<ul style="list-style-type: none"> Disturbance 	<ul style="list-style-type: none"> Cumulative Effects Framework – Human Disturbance Data from various sources, coarse level https://catalogue.data.gov.bc.ca/dataset/ce-disturbance-2021 Pacific Salmon Foundation Cumulative Pressures data https://data.salmonwatersheds.ca/data-library/ Satellite Forest Information For Canada (30m) https://opendata.nfis.org/mapserver/nfis-change_eng.html <ul style="list-style-type: none"> Wildfire year Harvest year Post disturbance recovery Forest elevation height Basal area Urban Greenness score And more Canadian Forest Service forest disturbance mapping 1984-2015 (30m) https://open.canada.ca/data/en/dataset/add1346b-f632-4eb9-a83d-a662b38655ad North American Land Cover (NALCMS) Change (2010-2015) (30m pixels) 	<ul style="list-style-type: none"> Cumulative impacts/disturbance on species, ecosystems and ecological connectivity 	<ul style="list-style-type: none"> Cumulative impacts on carbon storage 	<ul style="list-style-type: none"> Cumulative impacts on carbon sequestration 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> Cumulative impacts on watersheds/salmon 	<ul style="list-style-type: none">

DATA LAYER TYPE	POSSIBLE DATA SOURCES	ECOSYSTEM SERVICE REPRESENTED/DERIVED					
		Biodiversity	Carbon Mitigation		Culturally Significant Ecosystems <i>(only as defined by and with First Nations consent)</i>	Watershed Resilience	Wildfire Resilience
			Storage	Sequestration			
<ul style="list-style-type: none"> Wildfire risk 	<ul style="list-style-type: none"> Wild and Urban Interface Fire Risk maps (strategic level; based on VRI; does not include private land) https://www2.gov.bc.ca/gov/content/safety/wildfire-status/prevention/vegetation-and-fuel-management/fire-fuel-management/wui-risk-class-maps/wui-downloads Hazardous fuels mapping (based on VRI with groundtruthing) Community wildfire risk mapping 	<ul style="list-style-type: none"> Areas with high wildfire risk to biodiversity Priority areas for fuel management Priority areas for harvest/retention (e.g. mature and broadleaf forest) 	<ul style="list-style-type: none"> Areas with high wildfire risk to carbon storage Priority areas for fuel management Priority areas for harvest/retention 	<ul style="list-style-type: none"> Areas with high wildfire risk to carbon sequestration Priority areas for fuel management Priority areas for harvest/retention 	<ul style="list-style-type: none"> Wildfire risk to culturally significant ecosystems Priority areas for fuel management Priority areas for cultural management Priority areas for harvest/retention 	<ul style="list-style-type: none"> Areas with high wildfire risk to watersheds Priority areas for fuel management Priority areas for harvest/retention 	<ul style="list-style-type: none"> Areas at high/low risk of wildfire
<ul style="list-style-type: none"> Wildfire Magnitude 	<ul style="list-style-type: none"> Satellite Forest Information For Canada (30m) https://opendata.nfis.org/mapserv/r/nfis-change_eng.html <ul style="list-style-type: none"> Wildfire change magnitude Post disturbance recovery rate 	<ul style="list-style-type: none"> Restoration potential 					
<ul style="list-style-type: none"> Insect disturbance mapping 		<ul style="list-style-type: none"> Restoration potential 					
CLIMATE	POSSIBLE DATA SOURCES	BIODIVERSITY	CARBON STORAGE	CARBON SEQUESTRATION	CULTURALLY SIGNIFICANT ECOSYSTEMS	WATERSHED RESILIENCE	WILDFIRE RESILIENCE
<ul style="list-style-type: none"> Carbon mapping 	<ul style="list-style-type: none"> WWF Carbon Storage & Distribution in Terrestrial Ecosystems of Canada (250m) <ul style="list-style-type: none"> https://data.4tu.nl/collections/_/5421810/3 Trends Earth Tracking Land Change – soil carbon (250m) GSOC Global Soil Organic Carbon map Metro Vancouver carbon mapping UN Biodiversity Lab carbon mapping (above/below ground, change in woody carbon) (300m) 	<ul style="list-style-type: none"> High productivity areas 	<ul style="list-style-type: none"> Carbon inventory and tracking Priority areas for carbon storage Priority areas for retention/management to maintain carbon storage 	<ul style="list-style-type: none"> Carbon inventory and tracking Priority areas for retention/management/restoration, to maintain and enhance carbon sequestration 			<ul style="list-style-type: none"> Priority areas for wildfire risk management

DATA LAYER TYPE	POSSIBLE DATA SOURCES	ECOSYSTEM SERVICE REPRESENTED/DERIVED					
		Biodiversity	Carbon Mitigation		Culturally Significant Ecosystems <i>(only as defined by and with First Nations consent)</i>	Watershed Resilience	Wildfire Resilience
			Storage	Sequestration			
	<ul style="list-style-type: none"> Pacific Climate Impact Consortium Data Portal (https://pacificclimate.org/data) UBC Sustainable Agriculture Landscapes Lab -Soil Organic Carbon mapping in Lower Fraser Valley (30m?) (https://sal-lab.landfood.ubc.ca/projects/spatio-temporal-analysis-of-land-use-land-cover-and-soil-organic-carbon-in-lower-fraser-valley/) Composite distribution maps used for CDFCP Marxan and NPLCC Tool, https://ncc.carleton.ca/app/wheretowork_advanced?sp_hide_navbar=true <ul style="list-style-type: none"> Standing Carbon Carbon potential 						
Future ecosystems and climate refugia & corridors	<ul style="list-style-type: none"> ClimateBC Map (historic, current & future climate & BEC zones) https://www.climatewna.com/ClimateBC_Map.aspx Novel Climate Mapping (Mahoney et al.) Adapt West – <ul style="list-style-type: none"> Connectivity between current and future climate analogs in North America Integrated refugia and corridor priorities Climate Resilience Data Explorer UN Biodiversity Lab – <ul style="list-style-type: none"> Forest Landscape Integrity Index (300m) 	<ul style="list-style-type: none"> Corridor analysis and placement Priority areas for conservation/management 		<ul style="list-style-type: none"> Culturally important ecosystems at risk due to ecosystem changes Fish refugia, Refugia for cultural plants and other resources 		<ul style="list-style-type: none"> Future changes in wildfire risk Priority areas for fuel management 	

DATA LAYER TYPE	POSSIBLE DATA SOURCES	ECOSYSTEM SERVICE REPRESENTED/DERIVED					
		Biodiversity	Carbon Mitigation		Culturally Significant Ecosystems <i>(only as defined by and with First Nations consent)</i>	Watershed Resilience	Wildfire Resilience
			Storage	Sequestration			
<ul style="list-style-type: none"> Hydrological models 	<ul style="list-style-type: none"> Adapt West -Watershed Climate Data Explorer Pacific Climate Impacts Consortium Gridded Hydrologic Model Output (Fraser Valley) 	<ul style="list-style-type: none"> Impacts on fish and other aquatic life and related management priorities Impacts on riparian systems and related management priorities 	•	•	<ul style="list-style-type: none"> Impacts on important fish populations caused by climate related changes in hydrology. 	<ul style="list-style-type: none"> Projected climate impacts on watershed functioning Water security – planning for future drought and flood mitigation Priority areas for retention/restoration/management 	•
<ul style="list-style-type: none"> Climate change 	<ul style="list-style-type: none"> Pacific Climate Impacts Consortium Data Portal https://www.pacificclimate.org/data Pacific Climate Impacts Consortium Climate Explorer https://www.pacificclimate.org/analysis-tools/pcic-climate-explorer 	•	•	•	•	•	•
OPTIMIZER/TRADE OFF /VALUATION TOOLS	POSSIBLE DATA SOURCES	BIODIVERSITY	CARBON STORAGE	CARBON SEQUESTRATION	CULTURALLY SIGNIFICANT ECOSYSTEMS	WATERSHED RESILIENCE	WILDFIRE RESILIENCE
<ul style="list-style-type: none"> Conservation Planning 	<ul style="list-style-type: none"> Sites Conservation Canada Where to Work (web based tool for conservation prioritization – biodiversity & carbon) https://ncc.carleton.ca/ CDFCP Marxan Tool 	•	•	•	•	•	•
<ul style="list-style-type: none"> Ecosystem Valuation 	<ul style="list-style-type: none"> Costing Nature Policy Support System (web-based tool for ecosystem services) http://www.policysupport.org/costingnature 	•	•	•	•	•	•

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		Biodiversity	Carbon Mitigation		Culturally Significant Ecosystems <i>(only as defined by and with First Nations consent)</i>	Watershed Resilience	Wildfire Resilience
			Storage	Sequestration			
ADDITIONAL	POSSIBLE DATA SOURCES	BIODIVERSITY	CARBON STORAGE	CARBON SEQUESTRATION	CULTURALLY SIGNIFICANT ECOSYSTEMS	WATERSHED RESILIENCE	WILDFIRE RESILIENCE
<ul style="list-style-type: none"> Local government mapping 	<ul style="list-style-type: none"> Metro Vancouver environmental mapping http://www.metrovancouver.org/data 	<ul style="list-style-type: none"> Land cover classification (5m hybrid raster) Sensitive ecosystems tree canopy regional greenway corridors 	<ul style="list-style-type: none"> carbon biomass carbon ecotype carbon soil 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> Tree canopy & Impervious surfaces watershed boundaries 	<ul style="list-style-type: none">
<ul style="list-style-type: none"> Local government mapping 	<ul style="list-style-type: none"> CRD Environmental mapping https://mapservices.crd.bc.ca/arcgis/rest/services/Environmental/MapServer 	<ul style="list-style-type: none"> Sensitive ecosystems Potential sharp-tailed snake habitat 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none">
<ul style="list-style-type: none"> Local government mapping 	<ul style="list-style-type: none"> Surrey environmental mapping https://data.surrey.ca/dataset?groups=environment 	<ul style="list-style-type: none"> habitat suitability terrestrial hubs ecosystem corridors ecosystem sites (smaller sites 0.25-10ha in size) Green infrastructure network Aquatic hubs watercourses 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none">
<ul style="list-style-type: none"> Local government mapping 	<ul style="list-style-type: none"> Saanich environmental mapping https://www.saanich.ca/EN/main/community/natural-environment/environmental-planning/saanich-ecosystem-mapping.html 	<ul style="list-style-type: none"> Saanich environmental reference guide Environmentally sensitive areas (under development) 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none">
<ul style="list-style-type: none"> Local government mapping 	<ul style="list-style-type: none"> Courtenay environmental mapping 	<ul style="list-style-type: none"> Environmentally sensitive areas Tree canopy cover 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none">

DATA LAYER TYPE	POSSIBLE DATA SOURCES	ECOSYSTEM SERVICE REPRESENTED/DERIVED					
		Biodiversity	Carbon Mitigation		Culturally Significant Ecosystems <i>(only as defined by and with First Nations consent)</i>	Watershed Resilience	Wildfire Resilience
			Storage	Sequestration			
<ul style="list-style-type: none"> Local government mapping 	<ul style="list-style-type: none"> Islands Trust environmental mapping (http://maps.islandstrust.bc.ca/arcgis/rest/services/Dynamic) 	•	•	•	•	•	•
<ul style="list-style-type: none"> Local government mapping 	<ul style="list-style-type: none"> Vancouver GIS data - https://opendata.vancouver.ca/pages/home/ North Vancouver GIS data - https://geoweb.dnv.org/data/ 	•	•	•	•	•	•
<ul style="list-style-type: none"> Other data portals 	<ul style="list-style-type: none"> iMapBC, DataBC, HectaresBC, EcoCat https://open.canada.ca/en/open-data https://www.sentinel-hub.com/explore/eobrowser 	•	•	•	•	•	•
<ul style="list-style-type: none"> QGIS tool for remote sensing data training 	<ul style="list-style-type: none"> Semi-Automatic Classification Plugin. 	•	•	•	•	•	•