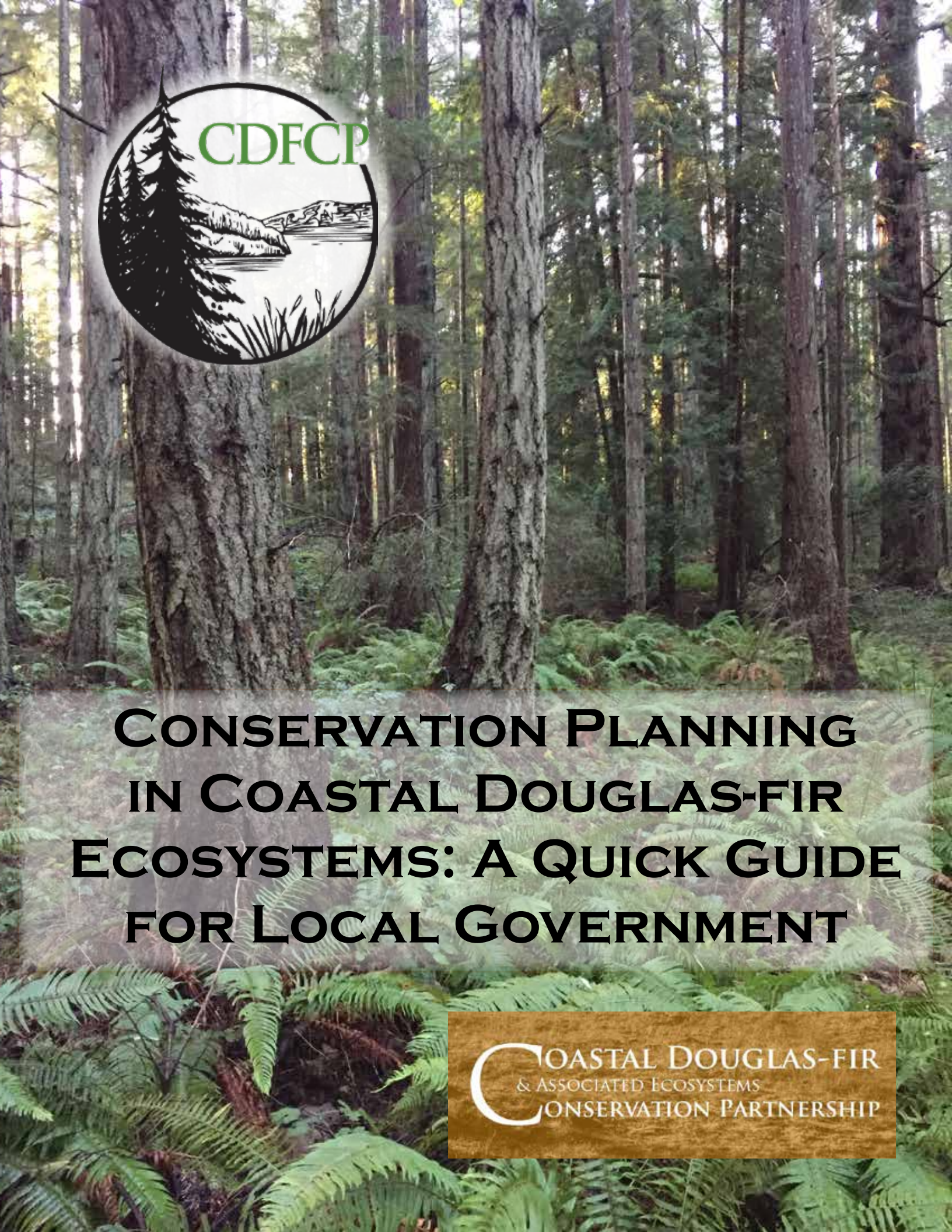

Conservation Planning in Coastal Douglas-fir Ecosystems: A Quick Guide for Local Government

Coastal Douglas-fir & Associated Ecosystems Conservation Partnership

About the CDFCP

The CDFCP arose from the recognition of a need for a more strategic and collaborative approach among those involved and interested in conservation efforts in Coastal Douglas-fir ecosystems, and was developed through a series of discussions and workshops including different levels of governments, non-government conservation organizations, and community residents who believe that by working together, we can more effectively achieve our shared conservation goals. The CDFCP promotes shared stewardship and will identify conservation priorities, reduce duplication of effort, share resources and information, and provide support to its participants.

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Acknowledgements

The CDFCP Steering Committee and local government members provided advice and support throughout the development of the Guide - thank you! We also appreciate the many local government staff who took time to provide ideas for inclusion in the document and the BC Conservation Foundation for their assistance.

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Writing and design: Judith Cullington

Photographs: Adam Taylor (pages 6, 13 and 14 and back cover); all other photographs (c) Judith Cullington.

What is the Coastal Douglas-fir Zone?

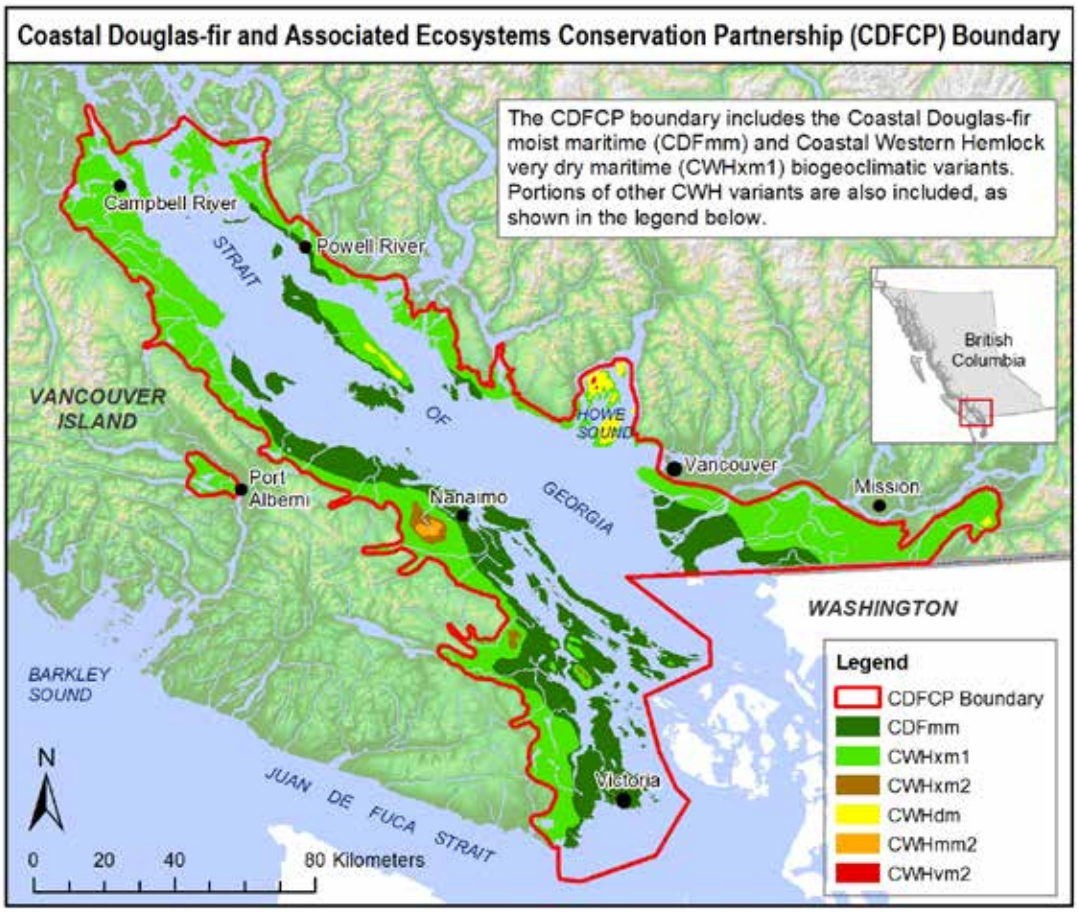
The Coastal Douglas-fir (CDF) Biogeoclimatic Zone is a unique set of ecosystems that are found in a narrow strip of south-east Vancouver Island, Gulf Islands, and the southwest Coast of British Columbia (BC) (see map). This set of ecosystems are found nowhere else in Canada, and the CDF is the smallest and most at-risk of BC's 16 biogeoclimatic zones.

The CDF features a wide variety of ecosystem types, including Garry oak ecosystems, rocky outcrops, wetlands and shorelines, in addition to Douglas-fir forests.

South-western BC also includes the Coastal Western Hemlock (CWH) zone. Like the CDF, this zone features many rare ecosystems, especially the "very dry maritime" types that are included within the CDF area of interest.

Biogeoclimatic Zones

A "biogeoclimatic zone" is an area with a relatively uniform climate, and with a mix of vegetation and soils that reflect that climate. A more detailed description of the Coastal Douglas-fir Biogeoclimatic Zone can be found in the Ecosystems of British Columbia: Chapter 5 Coastal Douglas-fir Zone.



What is the Coastal Douglas-fir Conservation Partnership?

The Coastal Douglas-fir Conservation Partnership (CDFCP) is a collaboration between the Province of BC, local governments, conservation organizations and local residents. It was formed to create a strategic and cooperative approach among those involved and interested in the conservation of CDF ecosystems. Its focus is primarily on private land, to complement Provincial initiatives such as the CDF Land-Use Order and Old-Growth Management Areas as well as conservation provided in parks by all levels of government. The CDFCP promotes shared stewardship and aims to identify conservation priorities, reduce duplication of effort, share resources and information and provide support to its participants in achieving conservation goals. For more information see http://www.cdfcp.ca/.

What is Conservation Planning?

Conservation planning is about explicitly and thoughtfully conserving natural values in a landscape of competing uses, objectives, values and threats. Conservation planning is most effective if it is part of a broader Ecosystem-based Management (EBM) planning framework that includes human activities. The NatureServe Network identifies several principles of EBM, such as respecting and integrating local knowledge and values, incorporating landscape connectivity and species movement corridors, and incorporating expert knowledge to provide a solid scientific basis for assessment and planning.

In the context of this Quick Guide, the term "conservation planning" includes efforts to protect and actively manage remaining natural CDF ecosystems through the tools available to local governments in conjunction with other conservation and stewardship efforts.

The Quick Guide

"Conservation Planning in Coastal Douglas-fir Ecosystems: A Quick Guide for Local Government" was created to help local government staff implement conservation planning for CDF ecosystems by increasing awareness of available conservation planning resources.

The CDFCP recognizes there can be significant challenges for local governments wanting to conserve CDF ecosystems. For example, these ecosystems are often not recognized as globally unique and endangered ecosystems, nor is their economic value as natural assets for local communities fully appreciated. Restrictions on development can be politically unpopular, while acquiring and managing CDF lands can be expensive. In addition, accurate mapping and data can be hard to come by and difficult to understand, and limited incentives exist for private land owners to implement conservation measures. There is no silver bullet to overcome these challenges. However, this Quick Guide is intended to provide some ideas and pointers that local government staff may find useful.

What makes Coastal Douglas-fir Ecosystems so Valuable?

This information is intended to provide material that can be provided in reports to Boards, Councils and in other public documents.

Coastal Douglas-fir (CDF) ecosystems are biologically important

CDF ecosystems[1]:

- are **rare**. CDF is the smallest of BC's biogeoclimatic zones, making up less than 0.3% of BC's total area.
- are **biologically rich**. They contain the highest diversity of plant species in BC and the highest diversity of over-wintering bird species in Canada.
- contain a very large number of **species at risk**. CDF contains more species at risk than any other biogeoclimatic zone in BC including 24 globally imperiled species and 282 species that are provincially-listed species at risk.[2]
- contain many **ecosystems at risk**. 98% (44 of 45) of the ecological communities in the CDF are considered "at risk".[3] CDF also includes the rare Garry oak ecosystems, of which less than 5% remains in a near-natural condition.

Coastal Douglas-fir forests provide benefit for our communities

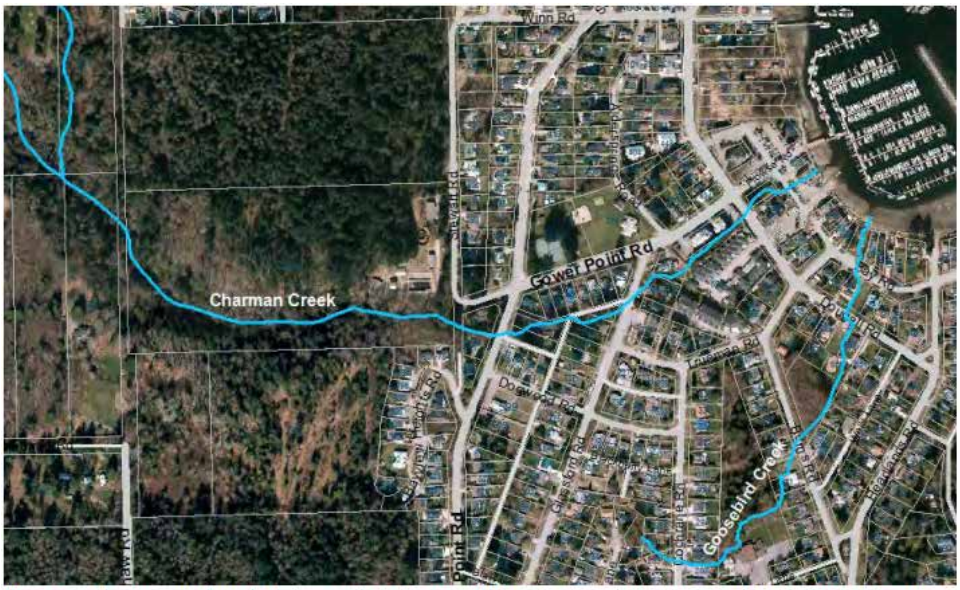
CDF forests:

- provide **recreational** opportunities such as hiking and camping. They provide habitat for salmon, deer and other species that support fishing and hunting, as well as educational opportunities to learn about natural environments. These natural areas are important for peoples' mental health and wellbeing, providing spaces for tranquility and reflection.
- help to **clean the air**. Forests reduce pollution and improve public health by trapping and removing dust, ash, pollen and smoke. Two mature trees provide enough oxygen for one person to breathe over the course of a year.[4]
- help to **clean our water** and protect drinking water. One large tree can capture and filter nearly 140,000 litres of water per year, protecting watersheds and filtering drinking water, thus avoiding or reducing the need for costly water treatment.[5]
- help to **absorb carbon** from the atmosphere. In one year, a hectare of forest can absorb four times the carbon dioxide produced by an average car's annual mileage.[6]
- provide **climate change mitigation and adaptation** by helping to reduce the risk of flooding.
- contribute to **food resilience** by providing habitat for pollinators and insectivores.
- **add value** to our properties and communities. On individual properties, proximity to trees and parkland can increase property values by 3–6% (or more).[7]

1 Statistics from http://www.cdfcp.ca/index.php/about/why-conserve-the-cdf
2 B.C. Conservation Data Centre Species and Ecosystems Explorer. Available: http://a100.gov.bc.ca/pub/eswp/ (accessed May 15, 2018).
3 Idem
4 http://www.americanforests.org/explore-forests/forest-facts/
5 Idem
6 Idem
7 http://www.toolkit.bc.ca/sites/default/files/Plantingourfuture.pdf

Coastal Douglas-fir Ecosystems are Under Threat from Human Pressures

- About 75% of the human population of BC lives in the CDF, including the major centres of Vancouver, Victoria and Nanaimo, where population growth is expected to continue.
- 80% of land in the CDF is privately owned, but only 11% of the CDF is protected in some way, making it the least-protected biogeoclimatic zone in BC.
- Almost half of the CDF lands have been converted for human use (urban, roads, agriculture, mining, industrial, etc.). The CDF has the highest road density of any biogeoclimatic zone in BC.
- Of the remaining forest lands, less than 1% of old-growth (>250 years) CDF forests remain.
- More than 151 introduced invasive species exist in the CDF.[8]
- Climate change will impact the forests. Longer summer droughts are resulting in growth declines in Coastal Douglas-fir forests.[9]



Vegetated areas and underlying soils in Upper Gibsons absorb rainwater thus reducing impacts on local creeks.

Image from Town of Gibsons "Towards an Eco-Asset Strategy in the Town of Gibsons". Forested areas in Upper Gibsons help to manage rainwater run-off, reducing the need for engineered solutions that would be expensive for the municipality.

8 MacDougall, A.S., B.R. Beckwith, and C.Y. Maslovat. 2004. Defining conservation strategies with historical perspectives: a case study from a degraded oak grassland ecosystem. Conservation Biology. 18: 455-465

9 https://www.unbc.ca/assets/bc_protected_area_research_forum/griesbauer_dendro_poster.pdf

Tools for Conservation of CDF (and other) Ecosystems

Mapping and Data Analysis

Good mapping is essential—if you can't identify the CDF ecosystems you want to conserve, they won't get conserved. Ideally, mapping will identify both core areas for conservation, and connectivity corridors that allow for wildlife movement.

The CDFCP has developed a user-friendly mapping tool (a version of the Marxan systematic conservation planning software) that uses known CDF ecosystem values to identify priority areas for conservation in the CDF zone. The existing priority conservation areas are based on targets for the entire CDF zone. However, the mapping tool can be modified to use with local government boundaries and other relevant conservation values.

Official Community Plans

Official Community Plans (OCPs) may contain policies for the "preservation, protection, restoration and enhancement of the natural environment, its ecosystems and biological diversity". (Local Government Act Section 474). OCPs can also designate Environmental Development Permit Areas (EDPA) and establish guidelines for conserving ecosystems within them (s. 488).

OCPs are important because they express community values and guide changes to zoning and development. If an OCP specifically mentions CDF ecosystem conservation, it provides an important rationale for action to conserve CDF ecosystems and ecosystem functions.

Development Permit Areas

Local governments can designate Development Permit Areas (DPAs) for a number of purposes, including the protection of the natural environment, its ecosystems and biological diversity. DPAs are adopted as bylaws and can be defined by maps of environmentally sensitive areas (ESAs). DPA maps are accompanied by guidelines on conditions for granting a development permit. A report from an environmental professional can be requested to ensure the proposal meets the guidelines (see *Development Approval Information Areas* below).

Development Approval Information Areas

Development Approval Information Areas work in concert with DPAs for the protection of the natural environment. A local government can designate areas where development approval information—such as a report from a professional biologist—is required as part of the DPA process.

Examples

- Many local governments have some form of online mapping tool that identifies environmentally sensitive areas (ESAs). The Comox Valley Regional District uses iMap, which includes a layer from its sensitive habitat atlas.

- The Galiano Island OCP has the following "Forest Objectives": All land use decisions for lands in the Forest designation must be guided by the following objectives: 1) to preserve a forest land base, 2) to preserve and protect the forest, its biodiversity, integrity and ecological services, 3) to encourage ecosystem-based sustainable forest management for all forested lots and to encourage economic opportunities through this forest management practice, 4) to encourage ecological restoration of degraded forest stands, and 5) to maintain or enhance carbon storage and sequestration." (p. 16)

- The South Pender Island OCP notes that this island is located in threatened CDF ecosystems, and provides policies for the protection of sensitive ecosystems. "Protection is to be afforded to the island's environmentally sensitive areas, according to particular circumstance, by means that may include: landowner stewardship; inter-agency planning and management agreements; protective covenants, voluntary and required; protective provisions in regulatory bylaws; development permit areas; and land acquisition." (p. 28)

- The City of Nanaimo OCP identifies Environmentally Sensitive Areas (ESAs). Tools for protection of ESAs will include dedication as a City park or trail, dedication to a private land trust (for example The Nature Trust of BC, Nature Conservancy of Canada, Nanaimo Area Land Trust Society) for conservation purposes; conservation covenant with an eligible organization, and/or density bonusing, cluster housing or other development incentives. (p. 85)

- In the Regional District of Nanaimo, four of the seven electoral area OCPs include a DPA for sensitive ecosystems. Guidelines note that "Existing native vegetation should be retained wherever possible to minimize disruption to habitat and maintain ecological processes that support ecosystem function, wildlife ecology, and unique ecosystems." Mitigation measures should be considered in the biological assessment, including minimizing vegetation removal, maintaining linkages with adjacent sensitive ecosystems, and timing construction to minimize impacts. (Bylaw 500, p. 5-14)

- The City of Nanaimo OCP includes development approval information areas for ESAs. As part of a development application, the City may require a report, prepared by a qualified professional, that includes: "A site inventory, commenting on the ecosystem classification, and based on current best practices such as the Resources Information Standards Committee Standards for Describing Terrestrial Ecosystems in the Field, providing information on the existing plant communities; aquatic and terrestrial habitats; sensitive ecosystems; nesting trees; the presence of rare species and rare plant communities; wildlife den sites; amphibian population presence (native and invasive); current on site and adjacent land uses; slope stability; erosion processes; hydrology and topography." (pp. 164-166)

Development tools

Local governments have other options to support ecosystem conservation, many of which are explained in greater detail in the Green Bylaws Toolkit. These include:

- **Zoning**: Zoning bylaws regulate siting and set the use and density of each zone in a community. Regulations can require landscape strips and setbacks from the shore and watercourses, but without a DPA, zoning cannot restrict the removal of vegetation. Zoning that requires setbacks from adjacent lots can provide buffers for protected areas and increase their functional size. Some communities use very low-density zones and lot averaging to create clustered subdivision layouts that protect natural features If a landowner has a large lot (over 4 ha), typically only a small portion of the lot is developed for the homestead, and the remainder may stay in a relatively natural condition, especially if a conservation covenant is placed on it. However, low density zoning patterns may also result in sprawl and can increase road density, forest fragmentation, spread of invasive species and wildfire risk.
- **Amenity zoning:** Land conservation can be negotiated at the time of rezoning through the amenity zoning process. Amenity zoning occurs where land is upzoned to allow for additional development if certain public amenities are voluntarily provided. For example, on a large parcel of land, the existing zoning might allow for a maximum of 10 residential lots to be created, but more could be permitted if public parkland and trail corridors are provided and constructed.
- **Density Bonus:** Bylaws can pre-zone land to allow an increase in density in exchange for natural area protection. Unlike amenity zoning, density bonus bylaws offer developers and the community certainty; a rezoning process is not required, and the maximum potential density is known ahead of time.
- **Clustering**: During rezoning or at time of subdivision, the local government or proponent can require negotiate a clustered development, where the homes or lots are grouped in one part of the property, leaving the rest as natural area. Clustering reduces per-lot development costs as there are fewer trees to clear, less land to grade, and less road, water, hydro, and sewer infrastructure needed to service the development. Smaller lots with significant amounts (more than 50%) of protected open space targets the growing consumer market that is seeking homes in natural settings with less property to maintain.
- **Density transfer**: This means allowing the permitted density from one parcel of land to be transferred to another property. It is a complex tool, in that it means downzoning one property (one that has high ecosystem values) and at the same time upzoning another (less ecologically sensitive) property. The ability to implement density transfers may be limited unless it is enabled by an OCP but this tool has a lot of potential for protecting large parcels.
- The Riparian Areas Regulation (RAR) directs local governments to protect riparian areas during residential, commercial and industrial development. RAR applies only to local governments on the east side of Vancouver Island, the Lower Mainland and the Southern Interior.

In addition to the above-mentioned tools, local governments can influence CDF conservation by requiring parkland creation when developing land and by enacting tree cutting bylaws (and soil removal and deposit bylaws).

Asset Management Plans

Many local governments are working to identify their assets—including natural assets such as forested ecosystems. Asset management is a systematic business process for making strategic and operational decisions about municipal assets over their entire lifecycle. Since asset management frameworks are an important tool for local government budgeting and priority setting, they can be used to raise the awareness of ecosystem services provided by CDF ecosystems.

Examples

- The District of Highlands OCP provides for density bonusing in return for specified provisions, including "Protection of sensitive 'high value' environmental areas by covenant". (p. 91)
- The Islands Trust has used density transfer on several islands, and has prepared a discussion paper looking at the pros and cons of this tool for Saturna Island.
- The Regional District of Nanaimo Electoral Area H OCP includes provision for density transfer in the Deep Bay Southwest.
- The Islands Trust Conservancy Regional Conservation Plan (2018–2027). The Islands Trust Conservancy has evaluated each local trust area/island municipality to determine geographical areas for conservation focus using a decision matrix.
- The Comox Valley Conservation Strategy Community Partnership prepared Nature Without Borders (2013). The strategy identifies, maps, and describes priority ecological areas for protection and restoration and is being used to guide park acquisition in the area.
- The Cowichan Valley Regional District is developing an ESA inventory and priority setting based on watersheds, in part to identify conservation priorities.
- Shawnigan Lake Electoral Area has developed an Ecosystem-based Conservation Plan (2015) for their watershed. This plan recognizes the important of the forest ecosystems for watershed protection and provides for healthy human cultures as well as natural systems.
- Many communities, such as Saanich and the District of Sechelt have developed urban forest plans to help protect and restore healthy urban forests within communities (including CDF ecosystems).
- The Town of Gibsons has assessed the value of its natural assets—including forests—alongside engineered assets such as roads and sewers. By understanding what it would cost to replace "free" ecosystem services such as drinking water protection, they have been able to place a value on the natural watershed and include it in their asset management plan. Gibsons was the first municipality in North America to pass a municipal asset management policy that: "explicitly defines and recognizes natural assets as an asset class; and creates specific obligations to operate, maintain and replace natural assets alongside traditional capital assets, including having natural asset management strategies and financial resources to maintain them." (Towards an Eco-Asset Strategy in the Town of Gibsons)
- The Municipal Natural Assets Initiative is working "to support and guide local governments in identifying, valuing and accounting for natural assets in their financial planning and asset management programs."

Strategic Plans

There are several excellent examples of local governments that have prepared strategic plans to help them identify priority areas for conservation, such as conservation strategies, watershed plans and urban forest plans.

Incentives for Landowners

Incentives—such as density bonusing—can help to 'sweeten the pot' in discussions with developers. There are also financial incentives for landholders to donate all or part of their land to a land trust, or to place a conservation covenant on their land.

Land Acquisition and Conservation Funds

Some local governments have the resources to acquire lands for conservation, usually as part of their parks system. In some areas of BC, Regional Conservation Funds have been established to support land acquisition and conservation projects.

Partnerships with Conservation Organizations

Local governments are not alone. South-western BC has numerous land trust and other local, provincial and national conservation organizations who are also trying to ensure long term ecosystem health. These groups also play a significant role in educating the public about ecosystem values. Many local governments have partnerships with these organizations to fulfill mutual goals. A list of CDFCP members and partners can be found on the website.

Examples

- The Islands Trust Natural Areas Protection Tax Exemption Program (NAPTEP) provides tax rebates of up to 65% for property holders who place a conservation covenant on their land. To date, this is only available to the Islands Trust area residents.
- The Land Trust Alliance of BC is promoting the creation of a Conservation Tax Incentive Program to enhance the conservation of privately-owned natural areas through voluntary actions.
- The federal Ecological Gifts Program provides significant tax benefits to landowners who donate ecologically sensitive land or a partial interest in land to environmental charities or other qualified recipients, who can ensure that the land's biodiversity and environmental heritage are conserved in perpetuity.
- The Cowichan Valley Regional District Regional Parkland Acquisition Fund was approved in 2008 following a public referendum. The 2017–2021 Financial Plan has budgeted $5.7 million for parkland acquisition (p. 35).
- The Capital Regional District Regional Parks Land Acquisition Fund was established in 2000 and applies an average $20 per residential assessment. Regional Parks, with its partners, has purchased 4,608 hectares of land for $56.3 million. Of that, Parks contributed $38.7 million (70%) and partners contributed $17.5 million (30%). The Land Acquisition Fund is scheduled to end in 2019. The CRD is undertaking public consultation to consider renewal of the land acquisition fund beyond 2019.
- Comox Valley Regional District conducted a survey of their residents, asking if they would support a new property tax to help pay for more parkland. It found that most residents are willing to contribute toward parkland acquisition. The regional district will also use development cost charges (DCCs) to fund the implementation of its parks and greenways strategic plan.
- The South Coast Conservation Program (SCCP) facilitates the protection and restoration of species and ecosystems at risk on BC's South Coast and has developed many resources for local governments.

Additional Information and Resources for Conservation Planning

CDF Information

The CDFCP website has useful links to:

- Data and mapping sources http://www.cdfcp.ca/index.php/about/research
- Articles and research on CDF http://www.cdfcp.ca/index.php/about/reports-articles

Local Government Resources

- The Green Bylaws Toolkit provides local governments with practical tools for protecting sensitive ecosystems. It includes bylaw language that local governments in BC are now using and explains various approaches, their benefits and drawbacks. The Toolkit provides a detailed review of OCPs and how they can be used to support ecosystem conservation and an analysis of EDPAs, some examples of how they have been applied, and sample EDPA language.
- Develop with Care: Environmental Guidelines for Urban and Rural Land Development in BC assists people who are involved in planning, implementing, reviewing and / or approving land developments in British Columbia's urban and rural areas. It provides guidelines for the maintenance of environmental values during land development and information how environmental stewardship can benefit communities, the property owner and developer.
- Species and Ecosystems at Risk – Local Government Working Group (SEAR- LGWG) Discussion paper and 2017 Report.
- The Stewardship Centre for BC's mission is to strengthen ecological stewardship in BC by providing educational, technical and capacity programs and resources to organizations, governments, the private sector and the general public through collaborative partnerships.
- Habitat Acquisition Trust, 2004. The HAT Manual: Protecting Natural Areas in the Capital Region. A summary of tools for use by local governments and stewardship groups.
- Province of BC and Union of BC Municipalities, 2008. Planting our Future: A Tree Toolkit for Communities.
- Province of BC, 2010. Urban Forests: A Climate Adaptation Guide.

Data and Mapping

- The Province of BC uses Terrestrial Ecosystem Mapping (TEM) standards. The Standard for Mapping Ecosystems at Risk in British Columbia describes British Columbia standards for mapping ecosystems at risk including sensitive ecosystems. Terrestrial Ecosystem Mapping for the CDF zone is available through EcoCat Ecological Reports Catalogue. Using TEM for the CDF zone, the BC Conservation Data Centre has completed mapping of Element Occurrences (locations) for two ecological communities (equivalent to plant communities) in the CDF.
- de Groot, A. and C. M. Cadrin. 2018. Ecosystem Status Report for *Pseudotsuga menziesii / Mahonia nervosa* (Douglas-fir / dull Oregon-grape) Ecological Community in British Columbia. Prepared for: B.C. Ministry of Environment and Climate Change Strategy, Conservation Data Centre, Victoria, B.C.
- The CDFCP Marxan Mapping Tool is a web-based, graphical user interface that uses Marxan conservation optimization algorithms. For a given area, it can look at the land parcels, land costs, biodiversity features and

desired conservation targets, to identify high priority parcels for acquisition or stewardship measures.

- In the CDF zone, Sensitive Ecosystems Inventory mapping (for East Vancouver Island and Gulf Islands and the Sunshine Coast) provides useful information on the location of some sensitive ecosystems.
- Community Mapping Network includes links to several mapping initiatives including Sensitive Habitat Inventory and Mapping (SHIM)
- A public version of Private conservation lands owned by non-government organizations managed for wildlife habitat conservation values is available. Another version including conservation covenants requires a data sharing agreement.
- Local Government Park Natural Areas identify parks or portions of parks within all Regional Districts and several municipalities in BC that are considered to provide natural ecosystem conservation. For further information, please contact Danielle Morrison (dmorrison@naturetrust.bc.ca).

Species and Ecosystems

- Garry oak ecosystems are part of the CDF zone. Many of the materials developed by the Garry Oak Ecosystems Recovery Team (GOERT) can also be applied to CDF ecosystems; including a series of fact sheets prepared for local governments and developers and a restoration guide.

Conservation Planning Guidance

- Rachel Holt, 2007. Conservation Planning and Targets for the Coastal Douglas fir Ecosystem. A Science Review and Preliminary Approach.
- Deborah Curran, 2013. A Resource Guide to Collaborative Conservation Planning. Prepared for Galiano Conservancy Association, this includes examples of different models for conservation planning that demonstrate multiple-use land management models that directly contribute to regional conservation priorities as well as to local socio-economic objectives for sustainable communities
- Silva Forest Foundation. Ecosystem Based Conservation Planning. Website with links to more information.
- NatureServe Canada: A Network Connecting Science with Conservation
- Ecosystem Services Toolkit: Completing and Using Ecosystem Service Assessment for Decision-Making – An interdisciplinary Toolkit for Managers and Analysts (2017).

Funding

- South Okanagan-Similkameen Conservation Program. (2017). Local Conservation Funds in British Columbia: A Guide for Local Governments and Community Organizations.
- Through a grant program, the Real Estate Foundation of BC supports land use and real estate practices that contribute to resilient, healthy communities and natural environments.
- A policy brief from the Smart Prosperity Institute on protecting species at risk on private land provides some ideas for incentivizing species at risk (and also ecosystem) protection on private land.

www.cdfcp.ca info@cdfcp.ca