Water Birch/Red-osier Dogwood

Betula occidentalis/Cornus stolonifera

Original[1] prepared by W.R. Erickson

Plant Community Information

Description

This shrub swamp community has a dense cover of water birch (*Betula occidentalis*) (up to 60% cover), mountain alder (*Alnus incana* ssp. *tenuifolia*) (5–10%), and red-osier dogwood (*Cornus stolonifera*) (7–40%) in the tall shrub layer. Water birch and mountain alder sometimes reach tree height (>10 m). Willows, such as sandbar willow (*Salix exigua*), Scouler's willow (*Salix scouleriana*), Bebb's willow (*Salix bebbiana*), and false mountain willow (*Salix pseudomonticola*), are found as tall shrubs on many sites (7–20% cover). Most sites have poison ivy (*Toxicodendron rydbergii*) as a low shrub (7–10% cover) and roses (*Rosa woodsii* and *Rosa nutkana*) (5–10% cover) as low or tall shrubs. Bittersweet (*Solanum dulcamara*), an introduced climbing vine, is present on many sites.

The herb layer is poorly developed (<10% cover) and variable, but generally contains a low cover of star-flowered false Solomon's seal (*Maianthemum stellatum*), and the introduced Canada thistle (*Cirsium arvense*). A few sites have a notable cover (3–7%) of stinging nettle (*Urtica dioica*) or horsetails (*Equisetum arvense* and *Equisetum hymenales*). There is neither a ground layer nor epiphytes of mosses or lichens in this community.

This community is poorly drained due to a high water table on floodplains. It occupies floodplains on level, depressional-swamp, or raised-levee sites, with a water table near the soil surface. Formed from fluvial (sandy, silty) or organic materials, soils are imperfectly to poorly drained Gleysols (Rego, Orthic, but most frequently, Humic), with organically enriched surface mineral Ah horizons, Typic Humisols, or Cumulic Regosols. It has been assigned a medium to rich nutrient regime and hygric to subhydric ecological moisture regime. Annual accumulation of deciduous plant litter is important in these dense leafy stands. Mountain alder contributes to site nutrition by fixing atmospheric nitrogen, making substantial amounts available for plant growth (Haeussler et al. 1990). These sites are nutrient-rich, productive, and subject to ingress by weedy species.

Sites may have standing water at the soil surface, and are cooled by frost and cold air drainage. This community occurs on middle stream reaches in narrow valleys, which may have a hummocky soil surface.

Distribution

Global

Not known. An equivalent water birch/red-osier dogwood shrubland community occurs or potentially occurs throughout the northwestern United States (California, Idaho, Montana, Oregon, South Dakota, Utah, Washington, Wyoming) (Faber-Langendoen 2001; NatureServe Explorer 2001).

British Columbia

This plant community is restricted to a very small part of the province, occurring in the main valleys and adjacent tributaries south from about Wild Horse Mountain in the Okanagan, and east/south of the confluence of the Ashnola River in the Similkameen Valley. There are isolated occurrences mid-way up some of those tributaries. There are

1 Volume 1 account prepared by S. Flynn and C. Cadrin.

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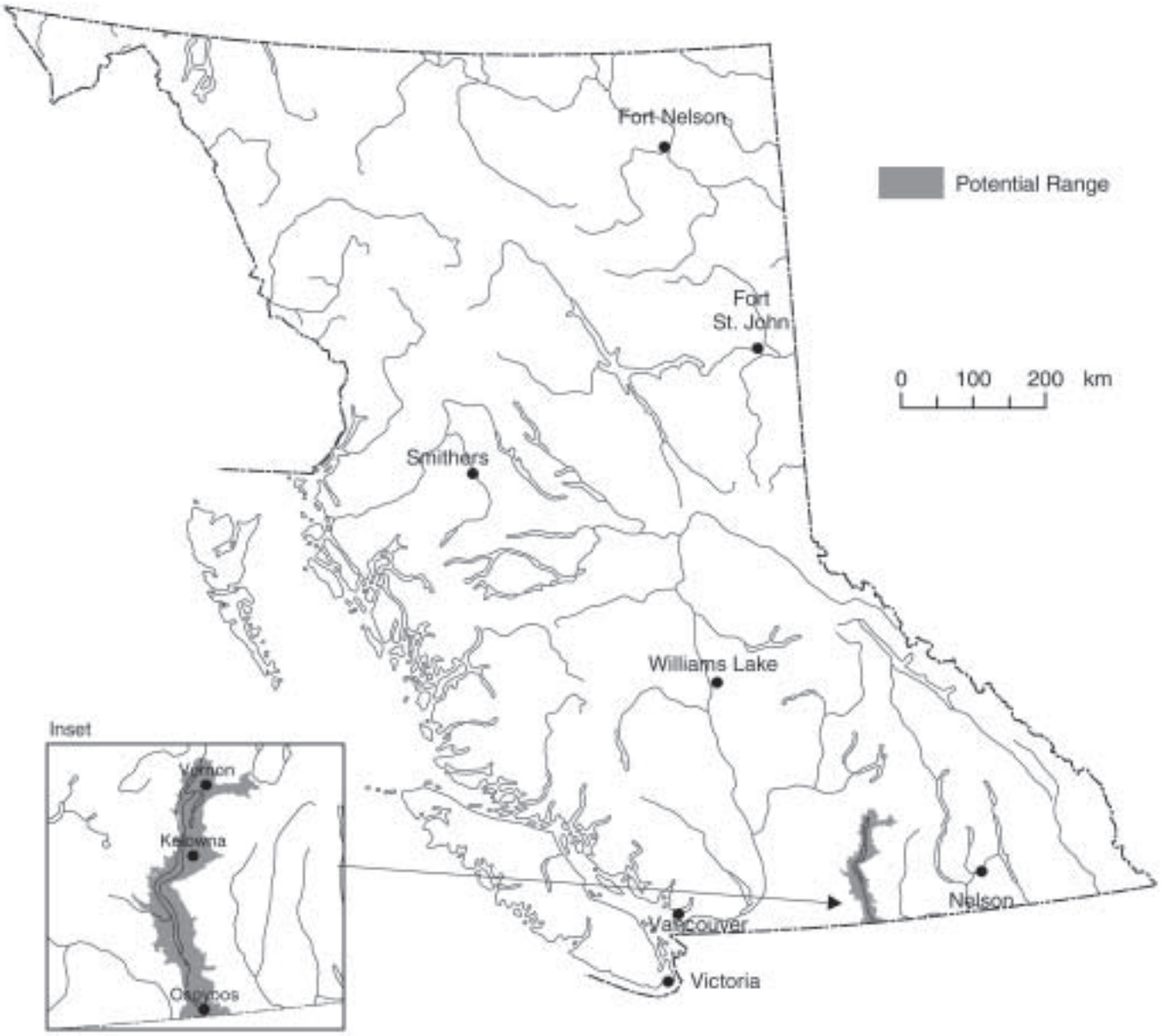

Note: This map represents the potential area where this plant community may be found. The map is based on the Ecoregion and Biogeoclimatic ecosystem classifications as well as current knowledge of the distribution of the plant community. This plant community occurs as localized areas within the range represented.

unconfirmed reports of this community in the Merritt and Stump Lake area (J. Kirkby; F. Russell, pers. comm.).

Forest region and districts

Southern Interior: Okanagan Shuswap, Cascades (unconfirmed)

Ecoprovince and ecosections

SOI: NOB, SOB

Biogeoclimatic units

BG: xh1/00

IDF: xh1/00, xh2/00

PP: xh1/00, xh2/00

Broad ecosystem unit

SW

Elevation

250–700 m

Plant Community Characteristics

Structural stage

3b: tall shrub

4: pole–sapling (when shrub layer is >10 m tall)

Natural disturbance regime

Frequent stand-maintaining fires (NDT4 or NDT3) (MOF and MELP 1995). The main natural disturbance at these sites is seasonal flooding. This community is surrounded by other wetland types such as marshes and shallow open water; and is associated with meadow communities and the alluvial complex of Brayshaw (1970). Brayshaw (1970) considered the related communities in the Alluvial Sere as being perpetually seral, presumably because of flooding and channel dynamics.

Freshets build stream banks and bring influxes of sediment, nutrients, and woody debris important to the ecosystem function of these sites. A flood cycle occurs every 20–30 years in a related riparian habitat type in Washington and Oregon (Crawford and Kagan 1998). Historically, beaver would have had considerable influence on these stands through herbivory; removing woody material; spreading willow cuttings that established; and controlling water levels as they dammed side channels.

Wildfires may have burned these stands in extremely dry years, leading to succession and replacement in the case of water birch, or to regrowth with shifts in species dominance in the case of shrub species. Water birch and mountain alder are thin-barked and susceptible to fire, but have the ability to produce abundant seed and resprout from basal buds (Haeussler et al. 1990; Hansen et al. 1996). Fires occurred with a frequency of every 25–50 years on related riparian habitat types in Washington and Oregon (Crawford and Kagan 1998). Much of the riparian vegetation, including *Betula occidentalis* and understorey shrubs, were killed by wildfire in one study (Royer and Minshall 1997). On the other hand, red-osier dogwood, roses, willows, and mountain alder can recover well and even increase their dominance after fire (Smith and James 1978; Haeussler et al. 1990; Bradley et al. 1992).

Ungulates may browse on willows, red-osier dogwood, and roses (Brown and Doucet 1991; Haeussler et al. 1990) in deep snow winters. However, water birch and mountain alder are not likely to be greatly affected, as they are not preferred browse (Haeussler et al. 1990; Hansen et al. 1996).

Fragility

Moderately fragile. Vulnerable to streamflow changes. Fragile soil base with sandy, silty, or organic textures, and with exposure to erosive events in floodplain positions. Less so on coarse soils with high coarse fragment content. Resilient for deep-rooted shrubs on these productive sites, but susceptible to understorey impacts and species invasions.

Conservation and Management

Status

The water birch/red-osier dogwood plant community is on the provincial *Red List* in British Columbia. It is ranked S1 in British Columbia. Its global status is unknown.

Trends

Declining. Much of the original extent of this community has been converted to agricultural use and channelled for water management. In 1995, an estimated 777 ha (13%) are extant, out of a historic total of 6025 ha. Further losses, as yet unmeasured, have occurred since these estimates (Dyer and Lea 2001; T. Lea, pers. comm.). Recent mapping (Dyer and Lea 2001) suggests that 20–50 occurrences remain, an increase from the previous estimate (CDC, unpubl. data), which was based on less information.

Threats

Most (87%) of this habitat in the Okanagan Valley has been lost to human development (Dyer and Lea 2001). What remains is mostly on private land. Threats and impacts include stream diversions such as channelization, privatization and subsequent conversion to cultivated fields and pasture, urban development, intensive grazing impacts, invasive species, and probably climate change.

Cattle tend to congregate in riparian areas, and can quickly eliminate the more palatable species such as rose and cow parsnip (*Heracleum* spp.). Continued use shifts the plant community composition to sod-forming grasses such as Kentucky bluegrass (*Poa pratensis*) and may promote the spread of invasive species. Loss of the deeper rooted grasses and replacement by these sodgrasses leads to instability in the stream banks, with consequential erosion and sedimentation and collapse. Cattle also impact the community by browsing shrubs such as willow and red-osier dogwood later in summer when grasses and forbs senesce (Roath and Krueger 1982). These shrubs are highly preferred by livestock and browsing ungulates (McLean 1979; Hansen et al. 1996).

Stream diversion, including channelization, threatens the integrity of obligate riparian species, such as water birch (Smith et al. 1991). Impacts are felt via moisture stress, especially during low flows experienced in years of reduced runoff (op. cit.). More subtle is the loss of bank building, influxes of woody debris, and the nutrients supplied with the annual surface deposition of sediments.

Legal Protection and Habitat Conservation

There is no legal protection for plant communities except for those occurring within protected areas and parks.

There are no current occurrences within protected areas, but there are opportunities to recover this community at Vaseaux Lake (Canadian Wildlife Service Vaseaux Lake Migratory Bird Sanctuary) and the north end of Osoyoos Lake (South Okanagan Wildlife Management Area) (Dyer and Lea 2001) and possibly in the Southern Grasslands and White Basin parks, and a range reference area exclosure at Fairview (R. Tucker, pers. comm.).

The *Forest and Range Practices Act* provisions for riparian areas, such as riparian management guidelines, may provide some protection for this community. Range use plans may be used to manage livestock grazing to ensure the protection of these communities. These plans may specify the Desired Plant Community and objectives for maintaining riparian communities in properly functioning condition. Because this community is a deciduous riparian community that does not contain commercial timber it is unlikely that old growth management areas would provide protection.

In Idaho, six riparian reference areas have been established for this community. Four of these are protected as follows: Tex Creek Wildlife Refuge/Management Area—about 60 ha out of 11 635 ha; Portneuf Wildlife Refuge/Management Area—8 ha out of 1256 ha; South Fork of the Snake River-Irwin

to Heise TNC Preserve—an undetermined area out of 837 ha; and Allison Creek Island in the Salmon River—10 ha, not formally protected but situated on an island (Jankovsky-Jones et al. 1999).

Identified Wildlife Provisions

Sustainable resource management and planning recommendations

This community has been recommended as the highest priority for conservation in the south Okanagan–Similkameen areas (Dyer and Lea 2001).

- ❖ Preserve and restore natural flood cycles that have historically maintained this community. This may involve restoring streams to their formal channels through the modification of current diversions, and restoring beaver to their natural hydrological role.
- ❖ Maximize connectivity of riparian areas. Where an occurrence of this community falls outside required riparian management areas, expand riparian management areas to include the occurrence of this community.
- ❖ Maintain or recover at least 20 occurrences in good condition across the range of the plant community.
- ❖ Maintain or restore occurrences to as close to natural condition as possible and practical.

Wildlife habitat area

Goal

Maintain or recover known occurrences.

Feature

Establish WHAs at occurrences that have been confirmed by a registered professional in consultation with the B.C. Conservation Data Centre or Ministry of Forests regional ecologists. Priority for WHAs should be on any climax condition occurrences. As a lower priority, WHAs may be established within earlier seral stages where the key species of the community are present in small patches, to recover community to climax condition.

Size

The size of the WHA should be based on the extent of the community occurrence. WHAs will generally be between 5 and 20 ha but may be larger, where the community has a patchy or linear distribution or where the community occurs in riparian complexes with other at-risk communities.

Design

The WHA should include the entire community occurrence plus 100 m around the perimeter of the occurrence. Wherever possible use geographic boundaries and features such as old stream bed channels. Minimize edge, unless occurrences are narrow, such as strips along stream channels. Include and protect stream banks, which, if disturbed, will disrupt sedimentation balances. Minimize inclusion of invasive species.

General wildlife measures

Goals

1. Maintain or restore plant community to a natural state (i.e., same species composition, physical structure, and ecological processes as natural examples of the plant community).
2. Set the following species as the Desired Plant Community: shrub cover >70%, composed of water birch (>15% cover), mountain alder (>5%), willows (as above, >7% cover), red-osier dogwood (>15% cover), poison ivy (>5% cover), roses (wood rose or Nootka rose, >5% cover), and sparse presence of star-flowered false Solomon's seal.
3. Manage to maintain and increase the species named above as the Desired Plant Community.
4. Maintain or restore natural hydrological regime. Accommodate changing stream bed conditions, cycles of sediment, nutrient and litter accumulation by channel maintenance/restoration, and control of disturbance.
5. Allow for natural flood cycles, sediment, and nutrient deposition and annual accumulations of plant litter.
6. Prevent physical disturbance, especially of the soil.

7. Minimize the introduction and spread of invasive species.
8. Maintain or restore to properly functioning condition.

Measures

Access

- Do not develop permanent or temporary roads.

Pesticides

- Do not use pesticides.

Range

- Plan livestock grazing to meet the general wildlife measure goals described above. Fencing could be required by the statutory decision maker to meet goals, to recover community, or for restoration treatments.
- Do not place livestock attractants within WHA.

Recreation

- Do not develop recreational sites, trails, or facilities.

Additional Management Considerations

Minimize impacts to vegetation, soils, and hydrology when operating adjacent to a WHA, particularly during road development and maintenance.

Apply restoration treatments to recover natural hydrological characteristics and to reduce/eliminate invasive species and re-establish native species.

This community is not a fire-maintained ecosystem, but it should be permitted to experience longer-term renewal though wildfire and extreme flood events. Any occurring older trees and snags could be retained on site, as they have an important role for wildlife of the riparian zone and adjacent uplands.

Restrict recreational use (i.e., dirt bikes, mountain bikes, and other off-road vehicles).

Avoid linear or extensive soil disturbances, which can lead to sedimentation and ingress by weeds. Weed control will require special treatments, such as mechanical treatment, because of the sensitivity and restrictions associated with the riparian zone. Access concerns are centred on any concentrating effect they may have on livestock or wildlife distribution, and on access corridors serving for the spread of invasive species (e.g., Canada thistle).

Private land stewardship will be an important component of the conservation of this community as many sites occur on private land.

Information Needs

1. Further inventory and confirmation of classification to clarify the extent of this community.
2. Monitoring of the herbaceous understorey composition with cattle exclusion and successional studies; and for any recovery trends in water birch communities without rose, red-osier dogwood, and other species.
3. Historical inference of past stream and riparian zone dynamics, and of the specific influence of beaver.

Cross References

"Great Basin" Gopher Snake, "Interior" Western Screech-Owl, Lewis's Woodpecker, Racer, Western Rattlesnake, Yellow-breasted Chat

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