Extension Note

B.C. Journal of Ecosystems and Management

Cariboo Forest Region: Part 2 of 3

Vegetation Complex Stand Establishment Decision Aids

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Introduction

Over the last four years, the Early Stand Dynamics program of FORREX–Forest Research Extension Partnership has assessed the information needs of the operational silvicultural community. This process has identified a number of issues relating to management of competing vegetation, forest health, silvicultural systems, and best practices. Besides information needs, members of the silvicultural community also expressed concern about the loss of their experiential knowledge.

These operational concerns prompted the initiation of an extension project to fill in the identified information gaps and document local knowledge. Competing vegetation and forest health were selected as the first subject areas on which to focus effort. Information relating to these two subject areas was collected, synthesized, and presented in an easy-to-use format. The resulting product was then presented to both the operational and scientific communities for their review and input.

The extension product generated by this process was called a "Stand Establishment Decision Aid" (SEDA). SEDAs are designed to provide information on the biological features that new and inexperienced practitioners need to consider when making silvicultural decisions about site limiting factors, such as competing vegetation or forest health. These decision aids are not intended to make the decisions for the practitioners. We currently base these decision aids on the Biogeoclimatic Ecosystem Classification (BEC) system. A description of this system is available on-line at: *www.for.gov.bc.ca/hfd/pubs/Docs/Srs/SRseries.htm*

The SEDAs for the Cariboo Forest Region will be published as a three-part series. The first two sections of the vegetation complex SEDAs identify specific species of concern that are found within the particular vegetation complex, and the geographic location of the complex in the forest region. The third section provides a treatment necessity rating system that identifies the specific biogeoclimatic zone, subzone, and site series where the vegetation complex can potentially be considered a problem. The fourth section outlines some possible silvicultural considerations that affect the species growing within this complex. These considerations could be used to develop a vegetation management strategy, if one is required. The fifth section provides information on some of the important autecological characteristics of the species occurring within this complex, followed by information on what roles and functions these species play in the ecosystem. We recognize vegetation community response is a function of many factors (e.g., type and intensity of disturbance); therefore, the vegetation complex SEDAs conclude with a resource section outlining where more information can be located. Reference material that is not available on-line can be ordered through the Queen's Printer at: *www.qp.gov.bc.ca*

Although these decision aids currently identify the problem first, rather than the particular ecosystem in which the problem occurs, we intend to develop a product that focuses on the ecosystem (subzone and site series) and ecosystem-specific problems. This extension product will be presented as part of a compendium of limiting factors in the Cariboo Forest Region, and is currently under development.

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Dry Shrub Complex – Cariboo Forest Region

B.C. Ministry of Forests, Nelson Forest Region

Site Series That May Require Vegetation Complex Treatment For Successful Conifer Establishment Following Clearcut Harvesting

In general, no areas in the Cariboo Forest Region require treatment of the dry shrub complex. However, backlog sites that have not been managed for many years may require some treatment.

Commonly Occurring Species*

Shrubs

falsebox	black huckleberry
common juniper	trapper's tea
tall Oregon-grape	soopolallie
saskatoon	snowberry

Herbs/Dwarf Shrubs

kinnikinnick	grouseberry
crowberry	

* **Note:** Species composition will differ between subcomplexes. Only species with a moderate to high ground cover (in any of the subcomplexes) are listed.

General Information

The dry shrub complex in the Cariboo Forest Region occurs on dry to fresh (xeric to mesic) sites within the Interior Douglas-fir (IDF), Interior Cedar–Hemlock (ICH), Montane Spruce (MS), and Sub-Boreal Spruce (SBS) biogeoclimatic zones. Species composition differs between the five subcomplexes found in the Cariboo Forest Region, and can vary considerably from zone to zone and from site to site. Site-limiting factors commonly associated with this complex include nutrient-poor soils (Podzol, Brunisol, and Regosol soil development, and mor humus forms), summer soil moisture deficits, growing season frosts, and a moderate root rot hazard. Many of these sites burned relatively frequently in the past because of their dry, warm climates or drier site conditions.

This complex is commonly found on warm aspects where canopy removal causes a rise in surface temperature and a loss of soil moisture.

Silvicultural Considerations

Important vegetation management considerations:

- Determine whether vegetation control will significantly improve seedling performance.
- Assess vegetation competition and control requirements on a site-by-site basis.
- This vegetation complex may become an important competitor with crop trees, particularly for soil moisture.
- Little published information is available.

Silvicultural Systems

- The response of the different species to overstorey removal depends on their shade tolerance. Following harvesting, some species may increase in cover (forming low thickets), while others may not.
- Shelterwood and selection cuts are generally less conducive to regeneration of this vegetation complex.

Establishment/Regeneration

- Treatments should reflect the need to conserve soil moisture rather than to eliminate competition for light. Because of the rhizomatous nature of the species in this complex, any treatment that damages root systems may increase the overall incidence of the species.

SITE PREPARATION

- Focus on the removal of competing vegetation immediately surrounding the crop trees.
- Minimize soil disturbance, as this may increase the incidence of the complex.
- Severe fall burns may successfully control competing vegetation on sites dominated by falsebox, snowberry, or soopolallie. Less severe burns will likely increase the density of vegetation in this complex. However, severe burns on many of these sites may adversely affect soil nutrient conditions.
- Mechanical site preparation is also likely to increase the density of competing vegetation.

CHEMICAL

- Foliar application of glyphosate provides control of snowberry. However, falsebox, with its leathery, evergreen leaves, appears somewhat resistant to herbicides.

PLANTING

- Larger stock types are recommended for sites where dry shrub density is high.
- Correct microsite planting is imperative.

Plantation Maintenance

- Treatments are not required.

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Specific Autecological Characteristics

Pre-disturbance

- This complex attains its best development in dry, open forests and clearings with coarse and well-drained sandy or gravelly soils. It also occurs on open rocky slopes.
- It is often present on droughty, low-nutrient sites, but not in areas with heavy snow accumulations.

Post-disturbance

- Harvesting open forests promotes the growth of this complex.
- Most species in this complex are somewhat resistant to fire, particularly snowberry and saskatoon.

Other Values of the Species

First Nations' Values

- Several dry shrub complex species produce edible berries.
- Soopolallie berries can be eaten fresh, or used to make ice cream, syrup, or juice.
- Soopolallie also has important medicinal values.
- Saskatoon berries were the most widely used fruit by First Nations peoples in the Southern Interior. Stems were used for arrow shafts and bows.
- Snowberry twigs were hollowed out for pipestems, while the berries were used to treat sore eyes and diarrhoea.

Provision of Unique Food/Habitat

- Deer browse several shrubs in this complex.
- The fruits of snowberry are a valuable food source for birds in winter.
- Areas with a dense cover of this complex may provide valuable thermal and visual cover for deer and other wildlife species.

Enhancement of Resource Availability

- Soopolallie is a nitrogen-fixing shrub; this element is, therefore, more available to other plants on these sites.

Protection

- Dry shrub complex species may offer some shade to young seedlings on dry and exposed sites.
- The susceptibility of falsebox to Armillaria root disease makes it a useful site indicator of the pathogen's incidence.

Bioregulation

- The rhizomatous species of this complex provide soil stability on sites susceptible to erosion.

Resource and Reference List

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Fireweed Complex – Cariboo Forest Region

B.C. Ministry of Forests, Cariboo Forest Region

Site Series That May Require Vegetation Complex Treatment For Successful Conifer Establishment Following Clearcut Harvesting

BEC Zone*	Subzone	Zonal	Drier Site Series	Wetter Site Series
ESSF	wk1	01		04 05 07
ICH	dk	01		05 06 07 08
	mk3	01		04 05 06 07
	wk2	01		05 06 07 08
	wk4	01		06 07 08
SBS	mc2	01		04 06 08
	mw	01		06 07 08 09 11
	wk1	01		06 07 08 09

Treatment Necessity Key

- Low – Treatment may be required
- Moderate – Treatment likely required
- High – Treatment almost always required

* See Steen and Coupé (1997) for an explanation of Biogeoclimatic Ecosystem Classification (BEC) zone, subzone, and variant abbreviations.

Commonly Occurring Species*

Shrubs

black huckleberry
black twinberry
falsebox
oval-leaved blueberry
thimbleberry
alder

Herbs

fireweed
lady fern
false Solomon's-seal

* **Note:** Species composition will differ between subcomplexes (see General Information for description of fireweed subcomplexes). Only species that can affect crop tree establishment are listed. For a particular subcomplex, species names appearing in **bold type** have moderate to high ground cover.

General Information

The fireweed complex occurs in virtually all biogeoclimatic zones of British Columbia where moisture is sufficient. It is abundant and best developed in moist, cool biogeoclimatic zones: the Interior Cedar–Hemlock (ICH), and the wetter Engelmann Spruce–Subalpine Fir (ESSF) and Sub-Boreal Spruce (SBS) zones. It occurs in a wide range of environmental conditions, but is most vigorous on mesic and sub-hygric sites under full light conditions. In the Cariboo Forest Region, two subcomplexes are recognized: the fireweed–low forb and the fireweed–moist forb. The fireweed–moist forb subcomplex prefers wetter sites and consists of a higher ground cover of fireweed and other tall herbs. Low shrubs, such as black huckleberry, oval-leaved blueberry, thimbleberry, black twinberry, and alder, may also be present in this subcomplex. The fireweed–low forb subcomplex prefers drier sites and consists of a lower ground cover of fireweed. Low shrubs, such as black huckleberrry and falsebox, may also be present in this subcomplex.

This complex develops on a variety of soil and site conditions, but is most vigorous on moist, open sites with medium- to coarse-textured soils. It establishes on both exposed mineral soil and duff. It occurs on a wide range of slopes and aspects, but in hot, dry climates it favours cool, moist, shaded locales.

Silvicultural Considerations

Important vegetation management considerations:

- Determine whether vegetation control will significantly improve seedling performance.
- Assess vegetation competition and control requirements on a site-by-site basis.
- This vegetation complex affects seedling performance as well as survival.

Silvicultural Systems

- Sites harvested in summer are more likely to develop a vigorous fireweed community than are winter-harvested sites.
- In moist and wet climates, clearcutting encourages fireweed competition by increasing light levels and soil temperatures, whereas partial cutting generally results in a lower cover of fireweed.

Establishment/Regeneration

SITE PREPARATION

- Mechanical site preparation or prescribed fire may increase fireweed establishment and, therefore, require follow-up treatment. Consider the forest management goal of the site before deciding on treatment.
- Prepare sites promptly after harvesting and before fireweed seed fall.

CHEMICAL

- Glyphosate provides good control of fireweed.

LIVESTOCK GRAZING

- Fireweed is highly palatable to sheep; however, later in the season the woody stems are not grazed.

PLANTING

- Plant immediately without site preparation where fireweed is a problem (unless seedling performance is inhibited by other problems that require site preparation, such as cold soils or snow press).
- Plant large, vigorous stock immediately after harvesting or site preparation to minimize reforestation problems in this complex.
- If severe competition is expected, plant shade-tolerant conifer species (e.g., lodgepole pine) immediately to outgrow the fireweed.
- Correct microsite planting (i.e., on raised sites and next to stumps) is imperative.

Plantation Maintenance

- Repeated manual brushing treatments, glyphosate, or repeated grazing treatments may be effective on sites where competition is heavy and conifer performance is threatened.

BRUSHING

- Brushing may not be needed on sites where fireweed levels are lower.
- Conduct a single manual brushing treatment in early August to obtain crop tree diameter growth while avoiding substantial fireweed re-growth and the resulting vegetation press.

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Specific Autecological Characteristics

Pre-disturbance

- Although associated with disturbed sites, fireweed can also occur in mature, usually seral forests, and is common in undisturbed alpine and subalpine meadows.

Post-disturbance

- Fireweed can be a serious impediment to seedling establishment, particularly when tall and dense.
- Fireweed spreads via wind-blown or buried seed, or via the pseudorhizomes of existing plants.
- It favours burned ground over unburned ground and rapidly exploits vacant niches, but is unable to compete where vegetation is already well established.
- After colonizing a site, fireweed populations expand mainly via perennial rhizome systems. Rhizomes spread horizontally, producing new shoots from buds along their length.
- Although fireweed colonies are capable of living for decades, their longevity depends on the rate of succession. As a canopy of shrubs and conifers develops, fireweed dies out or persists at low densities.
- Fireweed can out-compete crop trees for light, moisture, and nutrients.
- Fireweed can also damage young seedlings through vegetation and snow press.
- Fireweed cover of less than 35% is acceptable in new plantations stocked with shade-tolerant species.
- Fireweed may overtop slow-growing seedlings for 10 or more years.
- On cedar–hemlock sites, fireweed reaches peak abundance about 5 years after disturbance.

Other Values of the Species

First Nations' Values

- Fireweed was traditionally used to treat eczema.
- Inner pith was eaten raw, or the whole stem was boiled and eaten.
- Stem peelings were sometimes dried to make twine for fishing nets.
- "Seed fluff" was mixed with other substances and used for weaving or padding.

Provision of Unique Food/Habitat

- Fireweed is highly palatable to sheep, except for the older woody stems.
- Moose, bear, and Roosevelt elk browse fireweed to some extent in the summer; it is an important food source for all deer species in British Columbia. As shrubs become established, this complex likely will increase in importance to wildlife.
- Bees use fireweed flowers for honey production.
- Fireweed provides food and habitat cover for many small mammals.
- Thimbleberry and red raspberry fruit are favoured by many wildlife species in the province.
- Tall shrubs (e.g., alder and willow) provide cover for large mammals.

Enhancement of Resource Availability

- Sitka alder fixes nitrogen, improving soil nutrient status.
- Fireweed also stores nutrients and increases organic matter on severely disturbed sites.

Protection

- Brushing of this vegetation complex appears to increase the incidence of spruce leader weevil.
- Fireweed is used as a fuel break in fire-prone areas.

Bioregulation

- Fireweed roots provide soil stability and prevent nutrient leaching.
- Fireweed flowering times can indicate readiness of conifer cone crops for harvesting.
- Fireweed may delay shrubby vegetation development on harvested or burned sites.

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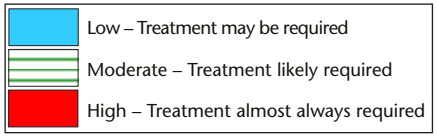
Mixed Hardwood–Shrub Complex – Cariboo Forest Region

B.C. Ministry of Forests, Cariboo Forest Region

Site Series That May Require Vegetation Complex Treatment For Successful Conifer Establishment Following Clearcut Harvesting

Treatment Necessity Key



* See Steen and Coupé (1997) for an explanation of Biogeoclimatic Ecosystem Classification (BEC) zone, subzone, and variant abbreviations.

Commonly Occurring Species*

Trees

paper birch
trembling aspen
black cottonwood

Shrubs

black twinberry
thimbleberry
prickly rose
fireweed
birch-leaved spirea
red-osier dogwood
black gooseberry
black huckleberry
falsebox

Herbs

lady fern
baneberry
cow parsnip
false Solomon's-seal

* **Note:** Species composition will differ between subcomplexes (see General Information for description of mixed shrub subcomplexes). For a particular subcomplex, species names appearing in **bold type** have moderate to high ground cover.

General Information

In the Cariboo Forest Region, the mixed hardwood–shrub complex usually contains a mixture of aspen, birch, and black cottonwood species. Three subcomplexes are recognized: the mixed hardwood–dry shrub, the mixed hardwood–moist shrub, and the mixed hardwood–willow. The mixed hardwood–dry shrub subcomplex occurs on drier sites and commonly contains a low to moderate ground cover of falsebox, black huckleberry, birch-leaved spirea, and prickly rose. The mixed hardwood–moist shrub subcomplex occurs on slightly wetter sites and contains a moderate to high ground cover of several shrubs and herbs, including black twinberry, red-osier dogwood, thimbleberry, lady fern, and cow parsnip. The mixed hardwood–willow subcomplex occurs on wetter sites and generally contains a substantial willow component. It also has a moderate shrub cover and low herb cover.

In the Cariboo Forest Region, this complex is most widespread in the Interior Cedar–Hemlock (ICH) and Sub-Boreal Spruce (SBS) biogeoclimatic zones. It also occurs less extensively in the Interior Douglas-fir Moist Warm (IDFmw) subzone. Black cottonwood is usually absent from sub-xeric and sub-mesic sites and is only of minor importance on mesic sites. On sub-hygric and hygric sites, however, it is a dominant species. Trembling aspen occurs in low abundance across the range of moisture regimes, but is most abundant in the sub-xeric sites, and generally absent from the sub-hygric and hygric sites.

Silvicultural Considerations

Important vegetation management considerations:

- Determine whether vegetation control will significantly improve seedling performance.
- Assess vegetation competition and control requirements on a site-by-site basis.
- High densities of broadleaf species severely reduce conifer growth, resulting in conifer mortality, especially for shade-intolerant species. However, low densities may be non-threatening or beneficial to conifer growth, site occupancy, and forest health.
- Manipulating the tree component of the vegetation complex can affect the shrub/herb component.

Silvicultural Systems

- Avoid harvesting and silvicultural practices that favour seeding-in of birch and cottonwood (i.e., when seed trees are left standing and harvesting disturbance has created a suitable seedbed). Most seed, however, is confined to within 100 m of standing trees. The sprouting vigour of mature trees cut during harvesting varies and sprout mortality is usually high.
- Retain mature aspen during harvesting operations to reduce post-harvest suckering.

Establishment/Regeneration

SITE PREPARATION

- The need for mechanical site preparation treatments is site-dependent; consideration must also be given to future brushing treatments.
- Soil disturbance that mixes mineral and organic soil layers favours germination of paper birch seed.
- If burning is possible, moderately severe burns can dramatically reduce both sprouting and seeding.

CHEMICAL

- Glyphosate, when applied as a foliar spray, provides good control of paper birch, cottonwood, or trembling aspen.

PLANTING

- Plant sturdy, large-caliper stock.
- Correct microsite planting is imperative.

Plantation Maintenance

BRUSHING

- A single manual brushing treatment allows lodgepole pine, but not Douglas-fir, to escape competition problems.
- As a possible alternative to broadcast brushing, selectively brush only competition-stressed conifers. However, any brushing treatment may increase Armillaria root disease mortality (if it is present on the site).
- Cut aspen high or hand-break (just below the lowest live branch) in June or July to control competition.
- In areas of high cattle use, avoid leaving stumps at a height that may damage a cow's udder.

CHEMICAL

- Herbicide applications will affect most stems of an aspen clone.
- Douglas-fir regeneration may require cut-stump glyphosate and girdling treatments of hardwoods to escape brush competition.
- Herbicide treatments do not appear to increase Armillaria.

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Specific Autecological Characteristics

Pre-disturbance

- Being shade-intolerant, birch, aspen and cottonwood thrive on burned over and cutover areas, and later become restricted to openings as the forest matures.
- Pure hardwood stands usually last only one generation without further major disturbance and then are generally succeeded by understorey conifers.

Post-disturbance

- Despite preferring shady regeneration sites, birch, aspen and cottonwood require abundant light for continued growth; these species rarely survive under established forests except in openings created by windthrow, insects, or diseases.
- Paper birch reproduces mainly from seed; however, it also reproduces vegetatively by sprouting of cut or damaged stems. Vegetative reproduction contributes substantially to birch density on sites where a high component of vigorous birch existed in the original stand.
- Birch reproduction is most favoured by: removal of the forest canopy to increase light, exposure of the mineral soil, or the creation of a good seedbed by mixing mineral and organic materials.
- Aspen usually regenerates from root suckers originating from a large underground root system; it rarely regenerates from seed.
- Cottonwood commonly regenerates from seed and stump sprouting, and occasionally from root suckers.
- Regeneration of cottonwood is also encouraged by mineral soil exposure.
- Minimizing soil disturbance and maintaining a leaf litter ground cover can discourage regeneration of cottonwood from seed.
- Conifer stands perform well with a small percentage of broadleaves in the stand. The amount will depend on the site and tree species involved.

Other Values of the Species

First Nations' Values

- The Carrier used decayed aspen wood for diapers and baby cradle linings.
- The Nlaka'pmx sometimes used aspen for dugout canoes.
- The Secwepemc used aspen for tent poles and drying racks.
- First Nations groups may have used the inner bark of aspen for a quinine-like drug.
- Black cottonwood was used extensively as a food source and to create pillows, soap, medicine, ointments for small cuts, glue, and even dugout canoes.

Provision of Unique Food/Habitat

- Hardwoods of this complex are important sources of food and habitat for ungulates, small mammals, and birds.
- Aspen suckers are highly nutritious and can contribute substantially to livestock diet, although cattle are deterred from entering young, dense aspen stands.
- Thimbleberry and fireweed are used by wildlife, but to a lesser degree than broadleaf trees.
- Sheep graze birch and thimbleberry minimally or erratically; aspen and fireweed are preferred forage.

Enhancement of Resource Availability

- Ecosystems dominated by this complex have a more rapid turnover of nutrients than do conifer ecosystems.

Protection

- Nurse stands of aspen, birch, and cottonwood offer frost protection.
- Aspen is a mechanically stable tree owing to its sucker-originated communal root system; its presence may offer neighbouring conifers increased resistance to windthrow.
- Cottonwood plays a very important role in stabilizing riverbanks and maintaining river islands; they also stabilize erosion banks and act as sediment filters, which protect conifer plantations from flooding.

Bioregulation

- Hardwoods of this complex are resistant to *Armillaria ostoyae* and immune to *Phellinus weirri*; their presence on a site may reduce the spread of these root diseases among neighbouring susceptible conifers.
- The presence of aspen, birch, and cottonwood also tends to discourage spruce weevil attacks.

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Wet Alder Complex – Cariboo Forest Region

B.C. Ministry of Forests, Cariboo Forest Region

Site Series That May Require Vegetation Complex Treatment For Successful Conifer Establishment Following Clearcut Harvesting

BEC Zone*	Subzone	Zonal	Drier Site Series	Wetter Site Series
ESSF	wk1			O5, O6
	wc3			O3
ICH	mk3			O6, O7
	wk2			O7
	wk4			O8
SBS	wk1			O8, O9, 10

Treatment Necessity Key

- Low – Treatment may be required
- Moderate – Treatment likely required
- High – Treatment almost always required

* See Steen and Coupé (1997) for an explanation of Biogeoclimatic Ecosystem Classification (BEC) zone, subzone, and variant abbreviations.

Commonly Occurring Species

Shrubs

Sitka alder
mountain alder
black twinberry
thimbleberry

Herbs

lady fern
bluejoint
spiny wood fern
fireweed

General Information

In the Cariboo Forest Region, the wet alder vegetation complex occurs on predominantly rich, wet (subhygric and hygric) sites. It is most common on north aspect slopes in the Engelmann Spruce–Subalpine Fir (ESSF) and Interior Cedar–Hemlock (ICH) biogeoclimatic zones. It occurs on a limited basis in the Montane Spruce (MS), Sub-Boreal Spruce (SBS), and Interior Douglas-fir (IDF) zones, where it is largely restricted to wet depressions and drainage tracts. Soils beneath this complex most commonly consist of Brunisols, Podzols, and gleyed subgroups. These soils are derived from morainal and fluvial materials and are moderately well to imperfectly drained. A relatively thick, organic enriched, loam to silt-loam surface mineral horizon (Ah) occurs on most sites. Subsurface horizons are commonly loam to sandy loam. Mottling may occur in imperfectly drained soils.

Because of the wet soils and lush vegetation of this complex, vegetation is difficult to control by burning or mechanical site preparation. Also, as this complex commonly occurs along streams and drainage channels, the use of herbicides to control vegetation is limited.

Silvicultural Considerations

Important vegetation management considerations:

- **Patches of alder in ICH and ESSF cutblocks (e.g., on steep side hills in heavy snow areas) generally have little coniferous content and are usually extremely difficult and costly to convert to "productive forest."**
- Determine whether vegetation control will significantly improve seedling performance.
- Assess vegetation competition and control requirements on a site-by-site basis.
- Vegetation management is generally required to achieve a free-growing crop.
- This complex can affect both the growth and survival of crop trees due to the height it can attain in a very short period of time.

Silvicultural Systems

- Overstorey removal increases light levels and, where the site is disturbed, may stimulate alder growth and competition.
- Summer harvesting promotes the development of this complex by exposing mineral soil and stimulating root sprouting.

Establishment/Regeneration

- If growth is abundant, this complex negatively affects seedling performance by competing for light and soil resources, by inhibiting soil and air warming, and by causing physical damage through snow and vegetation press.

SITE PREPARATION

- Use high-impact site preparation treatments that damage or destroy the root systems of competing vegetation. However, brushing is usually required as well.
- Apply severe treatments carefully to protect soils and other plant communities.

PLANTING

- Plant immediately after site preparation with large, sturdy stock to reduce the damage from vegetation and snow press.
- Raised microsite planting is imperative.

Plantation Maintenance

BRUSHING

- Apply brushing treatments after site preparation, but review requirements on a site-specific basis.

CHEMICAL

- Glyphosate seems most effective; apply as a broadcast spray in the late summer/early fall to minimize damage to seedlings.
- Glyphosate applied to cut stumps may also provide good control.

Revised, March 10, 2003

Wet Alder Complex – Cariboo Forest Region

Specific Autecological Characteristics

Pre-disturbance

- This complex is often well developed in gaps and along the borders of spruce–subalpine fir forests; spread from these areas into openings created by harvesting is likely.
- Sitka and mountain alder are common in the understorey of southern interior forests; if these species are damaged or cut during harvest, then they may spread vegetatively from the stump.
- Sitka alder is more widely distributed and more common than mountain alder in the Southern Interior.
- Mountain alder has a slightly higher requirement for soil water than Sitka alder. It is found most often on wet sites, whereas Sitka alder grows best on moist, but reasonably well-drained sites.
- Thimbleberry and black twinberry are common low shrubs in this complex and, like alder, increase in height and density in response to canopy removal.

Post-disturbance

- Alder invades new sites primarily by wind- and water-borne seeds.
- Alder can sprout from damaged or cut stumps, or reproduce by layering.
- Thimbleberry, black twinberry, and red elderberry produce abundant seed that are stored in the soil until conditions are favourable for germination.
- Once established, thimbleberry expands through rhizomatous growth.
- Ferns are generally on sites before disturbance. Some regenerate vegetatively by rhizomes, *although lady fern and spinywood fern usually do not.* Ferns also produce numerous spores that germinate on wet sites in the spring.
- Fireweed and bluejoint aggressively invade disturbed sites. Both are aggressive rhizomatous species and have light, wind-borne seeds that are distributed in late summer or fall; these seeds germinate on open, moist mineral soil.
- Fireweed is often present in the understorey to form the nucleus of the new colony.
- This complex rapidly occupies a site following harvest. Plants already on site are released, growing to capture newly available growing spaces. This complex also develops rapidly because of the high productivity of the ecosystems.

Other Values of the Species

First Nations' Values

- Sitka and mountain alder were commonly used by First Nations groups for preparing a reddish dye, for carving, and for smoking salmon and meat.
- Sitka alder was also used in basket making and as a source of fuel, while mountain alder was used to treat animal hides, make fish nets, and treat certain ailments such as bleeding.
- All central and southern interior groups harvested fresh thimbleberries.
- Thimbleberry shoots were peeled and eaten raw or cooked in a stew; the leaves were used to line baskets or as a surface for drying berries.
- Lady fern was used as a medicine, and the fiddleheads were a source of food in early spring.
- Several First Nations used black twinberry for medicinal purposes.

Provision of Unique Food/Habitat

- Few species in this complex are of high importance to wildlife, but several species are of low to moderate importance.
- Sitka and mountain alders provide cover for ungulates and also for small mammals, such as snowshoe hare, red squirrels, and voles.
- Thimbleberry and black twinberry both provide fruit that are eaten by various mammals and birds.
- Mature fronds and fiddleheads of lady fern provide black and grizzly bears early summer food.

Enhancement of Resource Availability

- An important benefit of both Sitka and mountain alder is their ability to fix nitrogen.

Bioregulation

- The high ground cover and dense rooting system of bluejoint acts as a soil stabilizer and increases organic matter content.

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