16520

**Alaskan Pacific-Aleutian Alder-Salmonberry-Copperbush Shrubland**

BpS Model/Description Version: Nov. 2024

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Reviewer: Hunter Gravley, Robin Innes

Vegetation Type

Shrubland

Map Zones

73, 74, 75, 76, 77, 78, 80

Geographic Range

This Biophysical Setting (BpS) occurs in the Alaska Range south and east throughout southeastern Alaska, north to the Prince William Sound and along the Alaska Peninsula and Kodiak Island. It diminishes moving west, occurring on low- to mid-elevation mountain slopes of the Aleutian Islands, and may be nearly absent by Dutch Harbor.

Biophysical Site Description

The alder-salmonberry system occurs from Prince William Sound through southeastern Alaska, in the maritime region of Alaska, typically found just above treeline, and is matrix-forming on the Alaska Peninsula and Kodiak Island but diminishes moving west. Soils are typically mesic, well-drained, shallow, and stony, and underlain by colluvium, glacial till, or residuum. Sites occur on flat to steep slopes (0-50°) at low to mid elevations (1-1,000 m) in valleys, hills, and mountains. The slopes are typically ash-covered, colluvium, or glacial drift. This system also includes partially vegetated bedrock ridges and cliffs in the alpine and subalpine, where it is found primarily on or near ridgetops and is exposed to extremely harsh growing conditions. More exposed sites subject the vegetation to a very short growing season, freeze-thaw pattern, and desiccating winds. Exposed bedrock or talus is usually a major component of the sites. This system appears to be relatively stable, although there may be an upward trend in the elevation of this system. Treeline conifers appear to be invading from below in some areas, and the elevational limit of low and tall shrub establishment appears to be rising.

Vegetation Description

Total low- and tall-shrub cover is >25%, and *Alnus viridis* or *Rubus spectabilis* contribute greater than 50% of the total shrub cover. *Rubus spectabilis* is dominant primarily on the oldest stabilized talus slopes and stable colluvial slopes (older substrates), while *Alnus viridis* may be the dominant shrub on recently disturbed sites, wind-sheltered sites, or recent ash deposits. *Alnus viridis* ssp*. sinuata* is the most common alder species, however, *Alnus viridis* ssp*. fruticosa* dominates some sites. Specifically on sites in southeastern and maritime Alaska, *Alnus viridis* ssp*. sinuata* is often the dominant species, but *Rubus spectabilis* may be codominant. Alder height ranges from 0.5 m at higher elevations to 8 m downslope. *Elliottia pyroliflora* can also dominate the overstory (10 to 80% cover), and ranges in height from 0.6-1.5 m (2-5 feet), on sites in the southeastern maritime region of Alaska with low-shrub cover in the lower alpine and subalpine zones. Other species on *Elliottia pyroliflora* dominated sites include *Phyllodoce aleutica, Nephrophyllidium crista-galli, Cornus suecica, Luetkea pectinata, Athyrium filix-femina, Cassiope mertensiana, Dryopteris expansa, Gymnocarpium dryopteris, Viola glabella*, and *Rubus spectabilis*. Krummholz *Tsuga mertensiana* occur in some sites. Adjacent to this system at higher elevations are alpine herbaceous meadows or dwarf-shrublands; at lower elevations *Tsuga mertensiana* forests or woodlands are common. Sites dominated by *Alnus viridis* or co-dominated by *Rubus spectabilis* include co-dominant shrubs *Sambucus racemosa, Oplopanax horridus, Spiraea stevenii*, *Elliottia pyroliflora,* and tall willows such as *Salix barclayi* or *Salix glauca*. The tall shrub system is often mosaiced with the mesic herbaceous meadow system. In closed-canopy sites, *Sambucus racemosa* and *Rubus spectabilis* shrubs are usually woven in among and around the edges of the alder thickets and the understory is sparse, often with *Athyrium filix-femina*, graminoids and sparse *Rubus spectabilis*. Litter cover is high. Sites co-dominated by tall willows typically occur along streams and at the upper limits of alder growth. In sites where patches of *Rubus spectabilis* or alder are mosaiced with mesic herbaceous meadows, common species include *Athyrium filix-femina, Aconitum maximum, Calamagrostis canadensis, Chamerion angustifolium* ssp*. angustifolium, Deschampsia cespitosa, Dryopteris expansa, Heracleum maximum, Lupinus nootkatensis, Solidago* spp., *Veratrum viride*, *Phegopteris connectilis, Equisetum arvense, Streptopus amplexifolius, Valeriana sitchensis, Geranium erianthum, Aconitum delphiniifolium, Castilleja unalaschcensis, Sanguisorba canadensis*, and *Carex macrochaeta*. In the more extreme locations, the vegetation cover is often fragmented or sparse and includes a complex of sparse tall or low shrubs, dwarf-shrubs, and herbaceous species. In the Aleutian Islands, *Vaccinium ovalifolium* typically contributes >50% of the total shrub cover, with total low-shrub cover of >25%. Herbaceous species include *Achillea millefolium var. borealis, Athyrium filix-femina, Chamerion angustifolium* ssp*. angustifolium, Calamagrostis canadensis, Cornus suecica, Geum calthifolium,* and *Sanguisorba canadensis*. *Empetrum nigrum* may also be common (DeVelice et al. 1999; Boggs et al. 2008; Talbot et al. 2005).

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| ALVIS | *Alnus viridis ssp. sinuata* | Sitka alder |
| ALVIC | *Alnus viridis ssp. crispa* | Mountain alder |
| RUSP | *Rubus spectabilis* | Salmonberry |
| SARA2 | *Sambucus racemosa* | Red elderberry |
| SABA3 | *Salix barclayi* | Barclay's willow |
| VAOV | *Vaccinium ovalifolium* | Oval-leaf blueberry |
| OPHO | *Oplopanax horridus* | Devilsclub |
| ELPY | *Elliottia pyroliflorus* | Copperbush |
| CACA4 | *Calamagrostis canadensis* | Bluejoint |
| ATFI | *Athyrium filix-femina* | Common ladyfern |
| DREX2 | *Dryopteris expansa* | Spreading woodfern |

Species names are from the NRCS PLANTS database. Check species codes at http://plants.usda.gov.

Disturbance Description

This BpS appears to be relatively stable (Mitchell 1968; Viereck et al. 1992). In this model it is hypothesized that infrequent soil disturbance can lead to a short-lived herbaceous sere. Insects and disease may affect alder (Keith Boggs, Alaska Natural Heritage Program, pers. comm.).

In 2015, an extensive literature search was done by Fire Effects Information System staff to locate information for a synthesis on fire regimes of Alaskan alder and willow shrublands with few results for this BpS (Innes 2015). Descriptions of fire ignition, season, pattern, and size specific to alder and willow shrublands were not found in the literature (Innes 2015). Alder and willow shrublands are frequently associated with landscape features that can form firebreaks, including wetlands, riparian areas, talus and boulder fields, and avalanche tracks (Innes 2015).

Fire Frequency

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Severity** | **Avg FI** | **Percent of All Fires** | **Min FI** | **Max FI** |
| Replacement |  |  |  |  |
| Moderate (Mixed) |  |  |  |  |
| Low (Surface) |  |  |  |  |
| All Fires |  |  |  |  |

Fire interval is expressed in years for each fire severity class and for all types of fire combined (All Fires). Average FI is the central tendency modeled. Percent of all fires is the percent of all fires modeled in that severity class. Minimum and Maximum FIs show the relative range of fire intervals as estimated by model contributors, if known.

Scale Description

Small to large patch and matrix forming.

Adjacency or Identification Concerns

Alaskan Pacific-Aleutian Alder-Salmonberry-Copperbush Shrubland and Alaskan Pacific Maritime Avalanche Slope Shrubland have similar species composition but have distinct models to reflect the differences in disturbance processes (i.e. snow avalanche and/or mass wasting events) affecting the two types.

In the Aleutians, this type can occur adjacent to Aleutian Ericaceous Dwarf-shrubland, Heath and Fell-field, and Aleutian Mesic Herbaceous Meadow (BpS 1651).

Issues or Problems

Native Uncharacteristic Conditions

There may be an upward trend in the elevation of this BpS today. Treeline conifers appear to be invading from below in some areas, and the elevational limit of low and tall shrub establishment appears to be rising.

Comments

4/2021 A reviewer commented that this BpS may be mapped as far east as Atka and Amlia Islands. If that is true, it may be mapped too far east. As stated in the description, this type may be nearly absent by Dutch Harbor.

10/2021 This description was updated by NatureServe staff and Kori Blankenship based on the updated Ecological Systems classification for Alaska. Edits focused on adjusting the Geographic Range, Biophysical Site Descriptions, and Vegetation Description sections.

In 2021 NatureServe merged:

* Alaskan Pacific Maritime Subalpine Alder-Salmonberry Shrubland (BpS 16520)
* Alaskan Pacific Maritime Subalpine Copperbush Shrubland (BpS 16720)
* Aleutian Mesic Alder-Salmonberry Shrubland (BpS 17180)
* Aleutian Oval-leaf Blueberry Shrubland (BpS 17310)

to create one Ecological System: Alaskan Pacific-Aleutian Alder-Salmonberry-Copperbush Shrubland. Kori Blankenship created one unified BpS model and description for this new Ecological System. The new model is based on the models for BpS 16520 developed by Tom DeMeo and reviewed by Paul Hennon for the Maritime region and BpS 17180 developed by Randy Swaty and Keith Boggs and reviewed by Jeff Williams. The models had similar states and deterministic transition. During this revision Blankenship incorporated review comments from Robin Innes for BpS 17180 and 17310.

Succession Classes

**Mapping Rules**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Upper Layer Lifeform** | **Height (m)** | **Canopy Cover (%)** | | | | | | | | | |
| **0-10** | **11-20** | **21-30** | **31-40** | **41 - 50** | **51-60** | **61-70** | **71-80** | **81-90** | **91-100** |
| Herb | 0-0.5 | A | A | A | A | A | A | A | A | A | A |
| Herb | 0.5-1.0 | A | A | A | A | A | A | A | A | A | A |
| Herb | >1.0 | A | A | A | A | A | A | A | A | A | A |
| Shrub | 0-0.5 | B | B | B | B | B | B | B | B | B | B |
| Shrub | 0.5-1.0 | B | B | B | B | B | B | B | B | B | B |
| Shrub | 1.0-3.0 | B | B | B | B | B | B | B | B | B | B |
| Shrub | >3.0 | B | B | B | B | B | B | B | B | B | B |
| Tree | 0-5 | B | B | UN | UN | UN | UN | UN | UN | UN | UN |
| Tree | 5-10 | B | B | UN | UN | UN | UN | UN | UN | UN | UN |
| Tree | 10-25 | B | B | UN | UN | UN | UN | UN | UN | UN | UN |
| Tree | 25-50 | B | B | UN | UN | UN | UN | UN | UN | UN | UN |
| Tree | >50 | B | B | UN | UN | UN | UN | UN | UN | UN | UN |

Succession class letters A-E are described in the Succession Class Description section. Some classes use a leafform distinction where a qualifier is added to the class letter: Brdl (broadleaf), Con (conifer), or Mix (mixed conifer and broadleaf). UN refers to uncharacteristic native or a combination of height and cover that would not be expected under the reference condition. NP refers to not possible or a combination of height and cover which is not physiologically possible for the species in the BpS.

**Description**

Class A 10 Early Development 1 - All Structures

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| CACA4 | *Calamagrostis canadensis* | Bluejoint | Upper |
| CHAN9 | *Chamerion angustifolium* | Fireweed | Upper |
| VEVI | *Veratrum viride* | Green false hellebore | Upper |
| HEMA80 | *Heracleum maximum* | Common cowparsnip | Upper |

Description

Post-disturbance mesic herbaceous stage. Grasses, sedges and/or forbs dominate the site.

*Maximum Tree Size Class*  
None

Class B 90 Late Development 1 - All Structures

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| ALVIS | *Alnus viridis* ssp*. sinuata* | Sitka alder | Upper |
| RUSP | *Rubus spectabilis* | Salmonberry | Upper |
| SARA2 | *Sambucus racemosa* | Red elderberry | Upper |
| OPHO | *Oplopanax horridus* | Devilsclub | Upper |

Description

Mature shrub stage. Shrubs overtop herbaceous layer and become dominant.

*Maximum Tree Size Class*  
None

Model Parameters

Deterministic Transitions

|  |  |  |  |
| --- | --- | --- | --- |
| **From Class** | **Begins at (yr)** | **Succeeds to** | **After (years)** |
| Early1:ALL | 0 | Late1:ALL | 9 |
| Late1:ALL | 10 | Late1:ALL | 999 |

Probabilistic Transitions

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Disturbance Type** | **Disturbance occurs In** | **Moves vegetation to** | **Disturbance Probability** | **Return Interval (yrs)** | **Reset Age to New Class Start Age After Disturbance?** | **Years Since Last Disturbance** |
| Optional 1 | Early1:ALL | Early1:ALL | 0.002 | 500 | Yes | 0 |
| Optional 1 | Late1:ALL | Early1:ALL | 0.002 | 500 | Yes | 0 |
| Insects or Disease | Late1:ALL | Early1:ALL | 0.01 | 100 | Yes | 0 |

Optional Disturbances

Optional 1: Soil Disturbance

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