16090

Alaska Sub-boreal Mesic Subalpine Alder Shrubland

Model Date: 04/11/08 Report Date: 9/11/15

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| --- | --- | --- | --- |
| **Modelers** |  | **Reviewers** |  |
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| None | None | None | None |
| None | None | None | None |

Reviewer: Robin Innes

Vegetation Type

Upland Shrubland

Map Zones

69, 70, 71, 72, 73, 74, 75

Geographic Range

Alaska Sub-boreal Mesic Subalpine Alder Shrubland is widespread on upper mountain slopes above treeline throughout the boreal transition region of AK (Viereck 1979). A riparian shrub variant of this system is found throughout the boreal and sub-boreal regions of AK in subalpine through alpine valleys.

Biophysical Site Description

These systems occur on well-drained mesic sites in the subalpine zone and in constrained riparian corridors on slopes in the alpine and subalpine. Seasonal overbank flooding may occur in the riparian areas, but generally it does not result in shifting channels or gravel bar formation (NatureServe 2008). Soils are shallow, stony and well-drained, underlain by colluvium, glacial till and residuum (NatureServe 2008).

Vegetation Description

This system often appears as a band of alder above treeline and below the alpine systems. Alnus viridis ssp. sinuata is the dominant shrub species, but other shrubs including Salix spp. (sometimes the dominant shrub), Sambucus racemosa and Spiraea stevenii may be common (NatureServe 2008). Herbaceous patches often occur within the shrub zone and may be dominated by Calamagrostis canadensis and Chamerion angustifolium; other common herbs include Athyrium filix-femina, Dryopteris expansa, Veratrum viride, Valeriana sitchensis, Lupinus nootkatensis and Sanguisorba sitchensis (Viereck et al. 1992).

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| ALVIS | Alnus viridis ssp. sinuata | Sitka alder |
| SALIX | Salix | Willow |
| SARA2 | Sambucus racemosa | Red elderberry |
| SPST3 | Spiraea stevenii | Beauverd spirea |
| CACA4 | Calamagrostis canadensis | Bluejoint |
| CHAN9 | Chamerion angustifolium | Fireweed |
| ATFI | Athyrium filix-femina | Common ladyfern |
| DREX2 | Dryopteris expansa | Spreading woodfern |

Disturbance Description

This system represents a topoedaphic climax (Viereck et al. 1992). It occurs above treeline and is not controlled by avalanche activity, although avalanches may occur.

There is little published information about the fire regimes of this BpS (Innes 2015). Attendees of the LANDFIRE National Modeling Meeting (2007, Anchorage) speculated that the fire return interval was likely long, possibly 500-1,000 years. Alders and willows are generally top-killed by fire, but will root sprout following fire (Viereck and Schandelmeier 1980). Early season fire prior to green-up would be more likely to carry than late season fire.

Alder is affected by insects and diseases (NatureServe 2008). Flooding and herbivory may be important disturbances, especially for the Alpine Riparian system (NatureServe 2008). It is believed that shrubs would resprout immediately following flooding and herbivory disturbances.

Fire Frequency

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Severity** | **Avg FI** | **Min FI** | **Max FI** | **Percent of All Fires** |
| Replacement | 833 |  |  | 100 |
| Moderate (Mixed) |  |  |  |  |
| Low (Surface) |  |  |  |  |
| **All Fires** | **832** |  |  | **100** |

Scale Description

Large patch

Non-Fire Disturbances

Adjacency or Identification Concerns

This system is similar in species composition to Alaska Sub-boreal Mesic Subalpine Alder Shrubland - Avalanche Slopes, but it occurs in the subalpine zone and tree growth is limited by elevation not avalanche frequency (NatureServe 2008). Pacific Maritime Tall Shrubland occupies a similar landscape position along the Gulf Coast of AK, but this system may be dominated by Rubus spectabilis, which does not occur in boreal regions. In the boreal transition region, the alder zone is intermixed with mesic herbaceous meadows (Calamagrosits canadensis and Chamerion angustifolium) (NatureServe 2008).

This system includes riparian shrub types in the alpine and subalpine zones.

Issues or Problems

In the absence of data on the fire frequency for this BpS, the MFRI was estimated to be slightly lower than that in the FRCC Guidebook Persistent Shrub North model.

Native Uncharacteristic Conditions

This system may have been expanding further into the alpine in recent decades (NatureServe 2008).

Comments

In 2015 an extensive search was done by FEIS staff to locate information for a synthesis on [Fire regimes of Alaskan alder and willow shrublands](https://www.fs.fed.us/database/feis/fire_regimes/AK_alder_shrub/all.html#78) (Innes 2015). At that time, the scientific literature about fire regimes in Alaskan alder and willow shrublands was scarce. Descriptions of fire ignition, season, pattern, and size specific to alder and willow shrublands were not found in the literature.

For LANDFIRE National this model was based on the FRCC Guidebook PNVG model for Persistent Shrub North (Murphy and Witten 2006). The MFRI was increased based on input from the experts who attended the LANDFIRE Anchorage (Dec. 07) modeling meeting. Tina Boucher reviewed an initial draft of this model and recommended eliminating mixed fire and decreasing the MFRI for Replacement Fire slightly so that the AllFire MFRI is slightly lower than that for Persistent Shrub North (these suggestions are reflected in the current draft of the model).

**Model Parameters**

*Using Track Changes in Word you may suggest changes to any of the parameters indicated in the following tables. If you wish to see how those changes impact model results, go to the “Simulation Model Review Instructions” section on* <http://www.landfirereview.org/models.html>*. If you do not wish to edit and run the actual model, the TNC LANDFIRE will do so and if requested provide the reviewer with the results.*

**Deterministic Transitions**

|  |  |  |  |
| --- | --- | --- | --- |
| **From Class** | **Begins at (yr)** | **Succeeds to** | **After (years)** |
| Early1:ALL | 0 | Mid1:CLS | 4 |
| Mid1:CLS | 5 | Mid1:CLS | 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** |
| ReplacementFire | Early1:ALL | Early1:ALL | 0.0005 | 2,000 | No | 0 |
| ReplacementFire | Mid1:CLS | Early1:ALL | 0.0012 | 833 | Yes | 0 |

Succession Classes

Class A 5 Early Development 1 - All Structures

Structural Information

Tree Size Class: None

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| CACA4 | Calamagrostis canadensis | Bluejoint | Upper |
| CHAN9 | Chamerion angustifolium | Fireweed | Upper |
| ATFI | Athyrium filix-femina | Common ladyfern | Upper |
| DREX2 | Dryopteris expansa | Spreading woodfern | Upper |

Description

Grasses, sedges and/or forbs dominate the site. Shrubs sprout from rootstock. Herbaceous patches often occur within the shrub zone and may be dominated by Calamagrostis canadensis and Chamerion angustifolium; other common herbs include Athyrium filix-femina, Dryopteris expansa, and Veratrum viride, Valeriana sitchensis, Lupinus nootkatensis and Sanguisorba sitchensis (Viereck et al. 1992).

Class B 95 Mid Development 1 - Closed

Structural Information

Tree Size Class: None

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| ALVIS | Alnus viridis ssp. sinuata | Sitka alder | Upper |
| SALIX | Salix | Willow | Upper |
| SARA2 | Sambucus racemosa | Red elderberry | Upper |
| SPST3 | Spiraea stevenii | Beauverd spirea | Upper |

Description

Shrubs overtop herbaceous layer and become dominant. A low shrub and/or herbaceous layer usually persists. Shrub cover is 25-75%. Alnus viridis ssp. sinuata is the dominant shrub species, but other shrubs including Salix spp. (sometimes the dominant shrub), Sambucus racemosa and Spiraea stevenii may be common.

References

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