

**Field Key to Ecological Systems of Map Zone 76
Aleutian Islands and Alaska Peninsula Alaska, United States**

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January 2009



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Introduction

The following keys to NatureServe ecological systems cover the areas found in the Aleutian Islands and on the Alaska Peninsula of Alaska, generally within NLCD map zone 76 (Figure 1). Three other documents contain field keys to the ecological systems of the Arctic, Boreal and Maritime regions of Alaska. The field keys were written for LANDFIRE by ecology staff of the Alaska Natural Heritage Program (<http://aknhp.uaa.alaska.edu/>), which is housed with the University of Alaska Anchorage. Descriptions for each ecological system can be found on NatureServe’s public website, NatureServe Explorer (<http://www.natureserve.org/explorer/servlet/NatureServe?init=Ecol>).

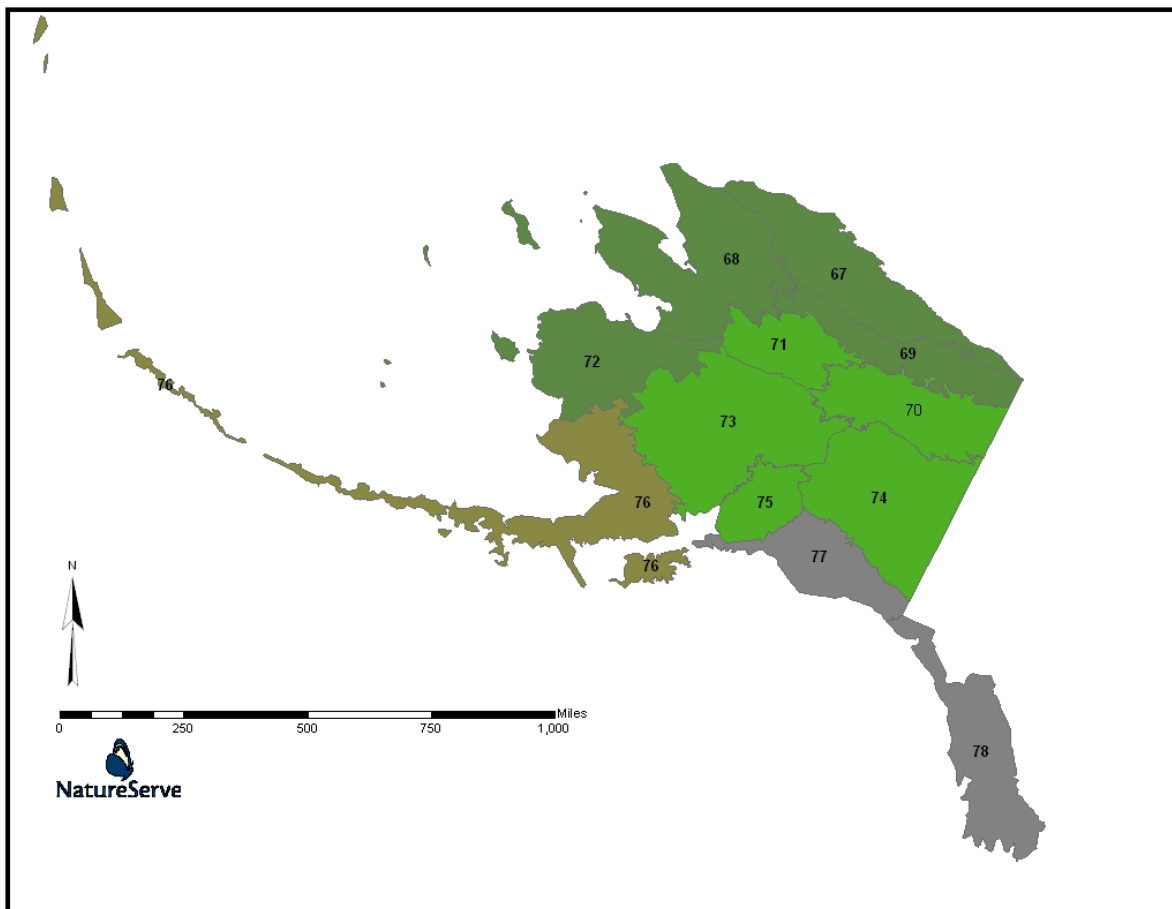


Figure 1. LANDFIRE map zones for Alaska. Keys in this document cover zone 76.

The systems and existing vegetation types included in these keys are intended to represent the legend that LANDFIRE will be striving to map for existing vegetation. Our primary purpose was to provide keys for the natural and near-natural vegetation of these zones. Existing vegetation types are successional plant communities that are encompassed in the concept of an ecological system. In these keys, they are keyed in separate sections following the particular ecological system in which they occur.

Some types are in the keys that characteristically occur at small spatial scales (generally <2 ha in size) and hence may not be mappable by the LANDFIRE project. However, we have chosen to be inclusive in the keys, so that the user will have information on these system types for comparison purposes. In some cases they may be important for modeling fire condition class and, given their relative distinctiveness on the landscape, they may indeed be mappable.

Plant names are almost always in Latin and follow the nomenclature of Kartesz (1999). In limited cases, we have included synonyms for some taxa. In some cases a common name is used, particularly for choices where a large number of species within a genus would need to be listed. For example, couplets may say “sedge cover >25%”, where any combination of *Carex* or *Eriophorum* species could meet the criteria specified in the couplet. Some of the common names used (and Genera for those) include sedge (*Carex*), alder (*Alnus*), and willow (*Salix*).

The keys are “dichotomous”, which means the user follows the order of the ‘couplets’ and makes a choice between the 2 options represented in the couplet. The ordering of the couplets in each key does matter, and the user should choose the option in each couplet that best fits the data or field situation. A choice leads the user to the next couplet to be utilized in the keying process, via a number at the far right, or else leads to a final result (an ecological system type or an existing vegetation type).

If the choice the user makes leads to a “result”, then either an Ecological System is named or an Existing Vegetation Type is named. The existing vegetation types are generally grouped together in a separate section of the keys from the ecological systems. Once an ecological system is reached in the key, it is always useful to read the description of the system to ascertain if the result fits what is described for the system.

Systems do not include Latin species names in them, and always start with a Biogeographic region (e.g. Alaska Arctic Acidic Sparse Tundra), and are in bold. Keys are generally based on dominance within vegetation strata, with tree cover generally considered first, then that of shrubs, then the herbaceous component. Codominant species within a given strata are important as well, in some cases a system type will have 2 or more codominant species, which may or may not be present in all stands. Many ecological systems will have a variable physiognomy; where appropriate these variable systems have been placed into the keys in several places (i.e. some grassland systems have a “shrub-steppe” physiognomy and hence will be in the key both as shrub-steppe and herbaceous). Environmental context parameters are also used in the keys, such as for distinguishing coastal or wetland systems from upland and non-coastal systems.

Some terminology is commonly employed throughout the keys that distinguish general spatial characteristics of the vegetation or environmental setting. For example ‘matrix’ types of vegetation are dominant across the majority of a given landscape, while ‘large patch’ types tend to occur as distinctive patches within the larger ‘matrix.’ Elevation-based life zones are commonly employed, with reference to ‘alpine,’ ‘subalpine,’ ‘montane,’ or ‘foothill’ zones. These zones vary in actual elevational thresholds across multiple map zones, and within individual map zones. More precise definition of these elevation breaks by map zone could be accomplished with additional research.

In the next section of the document we have provided a table showing the LANDFIRE legend units for the U.S. that represent non-natural vegetation, and a short description for each of them. They are not formally incorporated into the keys, since they are typically recognizable without the use of a key, or else their floristic composition is so variable as to be not useful in a field key. Most of these non-natural land cover types will not be mapped in the Aleutian Islands or the Alaska Peninsula region of Alaska, except perhaps in small areas adjacent to cities and towns.

Land Use, Unvegetated, Semi-natural and Altered Vegetation

LAND USE OR UNVEGETATED SURFACES	
Open Water	Open water
Developed	Generally developed lands.
Developed, Open Space	Vegetation (primarily grasses) planted in developed settings for recreation, erosion control, or aesthetic purposes. Impervious surfaces account for less than 20% of total cover. Examples include parks, lawns, golf courses, airport grasses, and industrial site grasses.
Developed, Low Intensity	Includes areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 20-50% of total cover. These areas most commonly include single-family housing units.
Developed, Medium Intensity	Includes areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 50-80% of the total cover. These areas most commonly include single-family housing units
Developed, High Intensity	Includes highly developed areas where people reside in high numbers. Examples include apartment complexes, row houses and commercial/industrial. Impervious surfaces account for 80 to100% of the total cover.
Agriculture	Generally developed for agricultural uses.
Pasture/Hay	These agriculture lands typically have perennial herbaceous cover (e.g. regularly-shaped plantings) used for livestock grazing or the production of hay. There are obvious signs of management such as irrigation and haying that distinguish it from natural grasslands. Identified CRP lands are included in this land cover type.
Cultivated Crops and Irrigated Agriculture	These areas used for the production of crops, such as corn, soybeans, small grains, sunflowers, vegetables, and cotton, typically on an annual cycle. Agricultural plant cover is variable depending on season and type of farming. Other areas include more stable land cover of orchards and vineyards.
Perennial Ice/Snow	
SEMI-NATURAL / ALTERED VEGETATION	
Ruderal Vegetation	Vegetation resulting from succession following significant anthropogenic disturbance of an area. It is generally characterized by unnatural combinations of species (primarily native species, though they often contain slight or substantial numbers and amounts of species alien to the region as well)
Ruderal Upland - Old Field	
Ruderal Upland - Abandoned Tree Plantation	

Ruderal Wetland	
Introduced Vegetation	Vegetation dominated by introduced species. These are spontaneous, self-perpetuating, and not (immediately) the result of planting, cultivation, or human maintenance. Land occupied by introduced vegetation is generally permanently altered (converted) unless restoration efforts are undertaken.
Introduced Upland Vegetation - Treed	Land cover is significantly altered/disturbed by introduced tree species.
Introduced Upland Vegetation - Shrub	Land cover is significantly altered/disturbed by introduced woody and/or herbaceous vegetation.
Introduced Upland Vegetation - Annual and Biennial Forbland	Land cover is significantly altered/disturbed by introduced annual and biennial forbs. Natural vegetation types are no longer recognizable. Typical species that dominate these areas are <i>Acroptilon repens</i> , <i>Leucanthemum vulgare</i> , <i>Cirsium arvense</i> , <i>C. vulgare</i> , <i>Euphorbia esula</i> , <i>Lepidium latifolium</i> , <i>Carduus nutans</i> , <i>Centaurea</i> spp. (<i>diffusa</i> , <i>solstitialis</i>), <i>Salsola kali</i> , <i>Bassia scoparia</i> , <i>Halogeton glomeratus</i> , <i>Melilotus officinalis</i> , and <i>Cardaria</i> spp.
Introduced Upland Vegetation – Annual Grassland	Land cover is significantly altered/disturbed by introduced annual grasses. Natural vegetation types are no longer recognizable. Typical species include <i>Bromus japonicus</i> , <i>B. rigidus</i> , <i>B. rubens</i> , <i>B. tectorum</i> , <i>Taeniatherum caput-medusae</i> , and/or <i>Schismus barbatus</i> .
Introduced Upland Vegetation - Perennial Grassland and Forbland	Land cover is significantly altered/disturbed by introduced, non-native perennial grasses and forbs. Natural vegetation types are no longer recognizable. Grass species include <i>Agropyron cristatum</i> , <i>Poa bulbosa</i> , <i>Bromus inermis</i> , <i>Phleum pratense</i> , and <i>Poa pratensis</i> . Forbs may include: <i>Centaurea</i> spp., <i>Cirsium arvense</i> , <i>Euphorbia esula</i> , <i>Lepidium</i> spp., <i>Melilotus</i> spp.
Introduced Riparian Vegetation	Land cover is altered/disturbed and dominated by introduced woody vegetation (woodlands and shrublands). Typical riparian trees and shrubs include <i>Elaeagnus angustifolia</i> , <i>Tamarix</i> spp., <i>Triadica sebifera</i> , etc.
Introduced Wetland Vegetation	Land cover is altered/disturbed and dominated by introduced wetland vegetation. Species may include <i>Lythrum salicaria</i> , <i>Phalaris arundinacea</i> , <i>Phragmites australis</i> , etc.
Modified/Managed Vegetation	Vegetation resulting from management or modification of natural/near natural; vegetation, but producing a structural and floristic combination not clearly known to have a natural analogue. Modified vegetation may be easily restorable by either management, restoration of ecological processes, and/or succession.
Modified/Managed Upland Vegetation	Land cover is apparently managed/modified and dominated by trees and/or shrubs. Vegetation is a mixture of herbaceous, shrub, and tree species.
Recently Burned Forest and Woodland	Land cover is apparently modified by recent fires which have burned forest and woodland vegetation. Vegetation is a mixture of herbaceous, shrub, and tree species.
Recently Burned Shrubland	Land cover is apparently modified by recent fires which have shrubland vegetation. Vegetation is a mixture of herbaceous and shrub species.
Recently Burned Grassland	Land cover is apparently modified by recent fires which have burned grassland vegetation. Vegetation is a mixture of herbaceous and shrub species.
Managed Tree Plantation	Land cover is apparently modified and appears as a managed tree plantation.
Recently Logged Timberland	Land cover is apparently modified and appears as logged timberland.
Modified/Managed Wetland Vegetation	These areas include created and obviously managed wetlands of varying size resulting from water diversion. Artificial Wetlands will be mapped where obvious built structures may be distinguished from imagery.

Key to Aleutian Island and Alaska Peninsula Ecological Systems and Existing Vegetation Types

This key is intended for identifying Ecological Systems and selected existing vegetation types that are found in the Aleutian Islands, and the Alaska Peninsula regions of Alaska. This region's geographic distribution starts where spruce forests end on the Alaska Peninsula and Kodiak Island, and extends west out the Alaska Peninsula and Aleutian Islands. The dominant vegetation is alder, low shrubs, dwarf shrubs and mesic herbaceous. Trees are uncommon. This region has little to no permafrost, low fire frequency, and a cloudy, foggy, windy, cool maritime climate with abundant year-round precipitation. In general, it coincides with the following Alaska ecoregions (Figure 2): Aleutian Islands (26), Alaska Peninsula (27) and Kodiak Island (28).

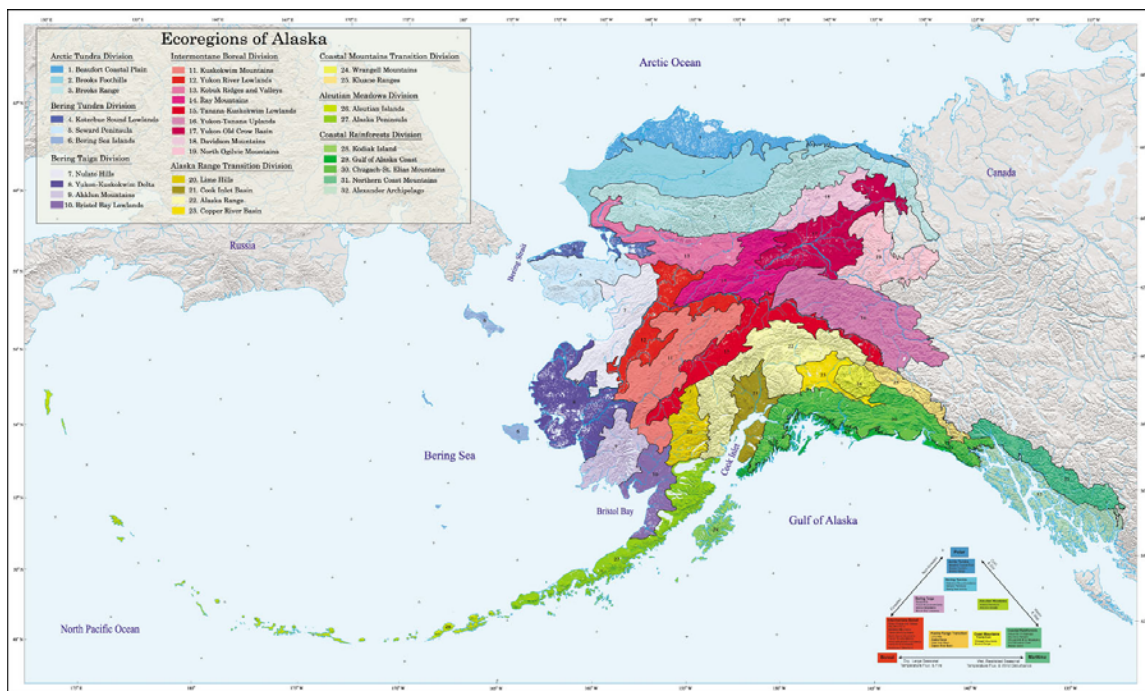


Figure 2. Ecoregions of Alaska. Figure from the final report of Nowacki et al. (2001). <http://agdc.usgs.gov/ecoreg/ecoreg.html> [Nowacki, G.; P. Spencer, M. Fleming, T. Brock, and T. Jorgenson. Ecoregions of Alaska: 2001. U.S. Geological Survey Open-File Report 02-297 (map).]

General Key

- 1a. Total canopy cover of vascular species is >25% 2
1b. Total canopy cover of vascular species is <25% 18
- 2a. System is a tidal marsh, coastal beach, coastal dune, or active and inactive portion of outwash plain and floodplain..... Go to **Process-Driven Ecological Systems**
2b. System is not a tidal marsh, coastal beach, coastal dune, or active and inactive portion of outwash plain and floodplain..... 3
- 3a. Total needleleaf tree cover is >10% Go to the **North Pacific Maritime Key** or the **Boreal Key**
3b. Total needleleaf tree cover is <10% 4
- 4a. Total broadleaf tree cover >25% 5
4b. Total broadleaf tree cover <25% 6

Forest and Shrubland Ecological Systems

- 5a. *Betula papyrifera* var. *kenaica* and/or *Betula papyrifera* dominate the sites.....
..... **Aleutian Kenai Birch-Cottonwood-Poplar Forest**
5b. *Populus balsamifera* ssp. *trichocarpa* or *Populus balsamifera* dominate the sites.....
..... **Aleutian Kenai Birch-Cottonwood-Poplar Forest**
- 6a. Cover of shrubs >20 cm tall is >25% 7
6b. Cover of shrubs >20 cm tall is <25% 11
- 7a. Alder dominates the low- and tall-shrub layers.....
..... **Aleutian Mesic Alder-Salmonberry Shrubland**
7b. Other shrub species dominate the low- and tall-shrub layers..... 8
- 8a. Willows dominate the low- and tall-shrub layers..... 9
8b. Other shrub species dominate the low- and tall-shrub layers..... 10
- 9a. Total tall-shrub cover is >25% and dominated by willows.....
..... **Aleutian Mesic-Wet Willow Shrubland**
9b. Total tall-shrub cover is <25%, total low-shrub cover is >25%, and dominated by willows.....
..... **Aleutian Mesic-Wet Willow Shrubland**
- 10a. *Rubus spectabilis* dominates the low- and tall-shrub layers.....
..... **Aleutian Mesic Alder-Salmonberry Shrubland**
10b. *Vaccinium ovalifolium* or other low shrubs dominate the low- and tall-shrub layers.....
..... **Aleutian Oval-leaf Blueberry Shrubland**
- 11a. Cover of shrubs <20 cm tall is >25% 12
11b. Cover of shrubs <20 cm tall is <25% 16
- 12a. The site is wet.....**Aleutian Shrub-Sedge Peatland**
12b. The site is dry to mesic (not wet) 13
- 13a. *Empetrum nigrum* is the dominant dwarf-shrub.....**Aleutian Crowberry-Herbaceous Heath**

- 13b. *Empetrum nigrum* is not the dominant dwarf-shrub.....
 **Aleutian Mixed Dwarf-Shrub-Herbaceous Shrubland**
- 14a. The site is wet and herbaceous cover is >10% 15
- 14b. The site is dry to mesic (not wet) and herbaceous cover is >25% 17

Herbaceous and Sparsely Vegetated Ecological Systems

- 15a. Vegetation is submerged, floating, or growing in permanent water.....
 **Aleutian Freshwater Aquatic Bed**
- 15b. Vegetation not submerged, floating, or growing in permanent water 16
- 16a. Dominant vegetation is emergent and herbaceous; semipermanent or standing water is present
 **Aleutian Freshwater Marsh**
- 16b Site is wet but standing water is uncommon; *Carex* spp. often dominant.....
 **Aleutian Wet Meadow and Herbaceous Peatland**
- 17a. *Leymus mollis* cover is >25% **Aleutian American Dunegrass Grassland**
- 17b. *Leymus mollis* cover is <25%, cover of other herbaceous species is >25%
 **Aleutian Mesic Herbaceous Meadow**

Key to common existing vegetation types within the **Aleutian Mesic Herbaceous Meadow** ecological system:

- A. Sites dominated by *Athyrium filix-femina*.....*Athyrium filix-femina* existing vegetation type
- A. Sites not dominated by *Athyrium filix-femina*.....B
- B. Sites dominated by *Chamerion angustifolium ssp. angustifolium*
 *Chamerion angustifolium ssp. angustifolium* existing vegetation type
- B. Sites not dominated by *Chamerion angustifolium ssp. angustifolium*.....C
- C. Sites dominated by *Calamagrostis canadensis*.....*Calamagrostis canadensis* vegetation type
- C. Sites not dominated by *Athyrium filix-femina*, *Chamerion angustifolium ssp. angustifolium*, or *Calamagrostis canadensis*. Typically a mixture of many herbaceous species
 Mixed Herbaceous Meadow existing vegetation type

- 18a. Total herbaceous cover is <25% and dominated by nonvascular species (*Sphagnum*, other mosses, liverworts) **Aleutian Nonvascular Peatland**
- 18b. Not dominated by nonvascular species (*Sphagnum*, other mosses, liverworts)..... 19
- 19a. Sparsely vegetated volcanic rock and cinder in the vicinity of active volcanic processes
 **Aleutian Volcanic Rock and Talus**
- 19b. Other sparsely vegetated substrates 20
- 20a. Coastal rocky headlands and sea cliffs with frequent exposure to salt spray. Vegetation cover is typically sparse to absent..... **Aleutian Rocky Headland and Sea Cliff**
- 20b. Not a coastal rocky headland or sea cliff with frequent exposure to salt spray. Total vegetation cover is 10-25% **Aleutian Sparse Heath and Fell-Field**

Process-Driven Ecological Systems

- 1a. Active and inactive outwash plain or floodplain 2
- 1b. Tidal marsh, coastal beach, dune, or beach meadow 4
- 2a. Sites are dry to mesic, or only periodically flooded 3
- 2b. Sites are wetlands on the floodplain **Aleutian Floodplain Wetland**

Key to common existing vegetation types within the **Aleutian Floodplain Wetland** ecological system:

- A. Vegetation is submerged, floating, or growing in permanent water
..... Freshwater Aquatic Bed existing vegetation type
 - A. Vegetation not submerged, floating, or growing in permanent water B
 - B. Dominant vegetation is emergent; semipermanent or standing water is present
..... Freshwater Marsh existing vegetation type
 - B. Dominant vegetation not emergent; semipermanent or standing water is uncommon C
 - C. Site is wet but standing water is uncommon; *Carex* spp. often dominant
..... Wet Meadow existing vegetation type
 - C. Cover of shrubs >20 cm tall is >25% Low Willow existing vegetation type
- 3a. Mid- to late-seral stages on the floodplain are dominated by broadleaf trees (primarily *Populus balsamifera* ssp. *trichocarpa* or *Populus balsamifera*)
..... **Aleutian Floodplain Forest and Shrubland**

Key to common existing vegetation types within the **Aleutian Floodplain Forest and Shrubland** ecological system:

- A. Total broadleaf tree cover is >25% Black Cottonwood-Balsam Poplar Forest existing vegetation type
 - A. Total broadleaf tree cover is <25% B
 - B. Cover of shrubs >20 cm tall is >25% C
 - B. Cover of shrubs >20 cm tall is <25%, herbaceous cover is >25%
..... Mesic Herbaceous existing vegetation type
 - C. Alder dominates the shrub layer Alder existing vegetation type
 - C. Willows dominate the shrub layer Tall Willow existing vegetation type
- 3b. All seral stages on the floodplain are dominated by herbaceous or shrub communities; trees are uncommon to absent **Aleutian Shrub and Herbaceous Meadow Floodplain**

Key to common existing vegetation types within the **Aleutian Shrub and Herbaceous Meadow Floodplain** ecological system:

- A. Cover of shrubs >20 cm tall is >25% B
- A. Cover of shrubs >20 cm tall is <25%, herbaceous cover is >25% C
- B. Alder dominates the shrub layer Alder existing vegetation type
- B. Willows dominate the shrub layer Tall Willow existing vegetation type
- C. Cover of *Leymus mollis* is >25% *Leymus mollis* existing vegetation type
- C. Cover of *Leymus mollis* is <25% Mesic Herbaceous existing vegetation type

- 4a. Tidally-influenced salt marshes, coastal freshwater marshes and mudflats 5
- 4b. Coastal beach, dune, or beach meadow; includes sand and cobble beaches
 **Aleutian Marine Beach and Beach Meadow**

Key to common existing vegetation types within the **Aleutian Marine Beach and Beach Meadow** ecological system:

- A. Sites dominated or codominated by *Leymus mollis* *Leymus mollis* existing vegetation type
- A. Sites not dominated or codominated by *Leymus mollis* B

- B. Sites dominated or codominated by *Empetrum nigrum* *Empetrum nigrum* vegetation type
- B. Sites not dominated by *Leymus mollis* or *Empetrum nigrum*. Common species include *Cochlearia groenlandica* (= *Cochlearia officinalis*), *Achillea millefolium* var. *borealis*, *Honckenya peploides*, and *Mertensia maritima* Salt Tolerant Forb existing vegetation type

- 5a. Vascular plant species cover is <10% **Alaska Arctic Tidal Flat**
- 5b. Vascular plant species cover is >10% **Aleutian Tidal Marsh**

Key to common existing vegetation types within the **Aleutian Tidal Marsh** ecological system:

- A. Sites dominated or codominated by *Carex lyngbyei*, *Carex glareosa*, *Carex ramenskii* or *Carex mackenziei* Tidal Sedge existing vegetation type
- A. Sites not dominated or codominated by *Carex lyngbyei*, *Carex glareosa* or *Carex mackenziei*. Sites dominated by other species such as *Puccinellia* spp. or *Plantago maritima*
 Tidal Herbaceous existing vegetation type