Vegetation Classification and Tree and Shrub Identification

Vegetation of Alaska

Alaska is a land of contrasts in climate, physical geography, and vegeta-tion. Alaska has the highest mountain in North America (Denali), as well as hundreds of square kilometers (km) of boggy lowlands. The climate varies from mild and wet to cold and dry. Temperatures in coastal areas range as much as 38° C (70° F), while the temperature range in the Interior can be as much as 83° C (150° F) in a single year. Spanning nearly 2,100 km of latitude and 3,500 km of longitude, Alaska's vegetation varies from the tall, fast-growing forests of Southeast and the low, slow-growing boreal forests of the Interior to the treeless tundra of the north. A fold-out map of vegetation types follows page 38.

Of Alaska's land surface, approximately 48 million hectares (119 million acres) are forested. Of these, 11.2 million hectares (28 million acres) are classified as "commercial forests." These great timber reserves provide the basis for one of the state's largest industries, one that will likely continue to expand in size and importance as the timber demands of the heavily populated areas of the world increase. At present, most of the state's timber production is from the Tongass and Chugach national forests, which contain 92 percent of the commercial forests of coastal Alaska. Nearly all the rest is from other areas within the coastal forests. But as timber demands increase, greater use will be made of the timber reserves of the interior boreal forests.

In addition to timber values, Alaska's forest and tundra have other important uses. Much of Alaska is still wilderness, and the value of undisturbed wild areas far outweighs the potential value for producing lumber and pulp. An increasing number of people look to Alaska for wilderness that is no longer present in the more developed areas of the world. Thus, it is important that some areas of Alaska be retained in their natural state. Tourism in Alaska is a growing industry, based primarily on the quality of the scenery, wilderness, and wildlife.

Alaska's forests provide many recreational opportunities, including hiking, camping, fishing, and canoeing, especially in the national forests with their extensive trail and shelter systems. The national parks and monuments provide the visitor with an opportunity to see some of the most spectacular forest and mountain scenery, while the national wildlife refuges and ranges, although primarily set aside for the protection and management of wildlife, also have campgrounds, trails, and other recreational facilities. In the interior boreal forests,

the Bureau of Land Management and the state of Alaska provide campgrounds, cabins, hiking trails, and winter trails for cross-country skiing and dog mushing through the forest and tundra areas. More development of recreational facilities is planned for the future.

One of the most important resources of the Alaska forests is the wildlife species that inhabit them. The Alaska forests provide habitat for large numbers of birds and mammals, most of which are dependent directly or indirectly on woody plants for food and shelter. Even big game animals, such as Dall sheep (*Ovis dalli*), mountain goat (*Oreamnos americanus*), and muskox (*Ovibos moschatus*), that spend much of their lives above or beyond treeline use low woody plants for food during some part of the year.

Moose (*Alces alces*) is probably the most abundant and widespread large mammal of the interior forests; occasionally its range extends into tundra and coastal areas. Moose survive the winter primarily by browsing on willows and other shrubs, especially where shrubs grow thickly after forest fires and in willow thickets along rivers. In coastal areas, black-tailed deer (*Odocoileus hemionus*) feed primarily on blueberry and other shrubs when snow covers the lower vegetation. In the summer, deer feed on herbaceous plants that grow in openings in the coastal forests. Even caribou (*Rangifer tarandus*), often considered a tundra animal, spend the winters in the open forests adjacent to treeline, especially where lichen growth is abundant. In the summer, caribou use several woody shrubs, especially resin and dwarf arctic birch and willows, as well as herbaceous tundra vegetation. The small red squirrel (*Tamiasciurus hudsonicus*), which is itself a source of food for larger furbearers, is dependent throughout the winter on seeds from spruce cones gathered and stored underground.

Several bird species survive the Alaskan winters primarily on woody plants. Ptarmigan (genus *Lagopus*) feed on willow and shrub-birch buds, while ruffed (*Bonasa umbellus*) and sharp-tailed grouse (*Tympanuchus phasianellus*) forage for berries from the past summer and feed on the buds of shrubs and trees. The spruce grouse (*Falcipennis canadensis*) of the Interior and the blue grouse (*Dendragapus obscurus*) of the coastal areas subsist largely on the needles and buds of spruce trees, as well as berries and buds of many shrubby species.

In the summer, insect life abounds in the forests and produces food for large numbers of small birds that nest and rear their young before migrating south in the fall. In addition, Alaskan forests and tundra are dotted with numerous lakes that serve as nesting places where large numbers of waterfowl rear their young during the short summer season.

Thus, the forests of Alaska provide more than timber to the people of Alaska and the rest of the United States. They offer wilderness; a place to hike, hunt, and fish; and areas to see and photograph wildlife. They are

important in protecting our water resources, and they furnish a habitat for many wildlife species.

The following section lists the main vegetation types of Alaska and the most important trees and shrubs in each. The number given for each vegetation type corresponds to a color on the fold-out vegetation map.

Coastal Forests

Dense forests of Western hemlock and Sitka spruce, a continuation of similar forests along the coast of British Columbia, Washington, and Oregon, extend about 1,500 km along the Alaska coast to Cook Inlet and Kodiak Island. Commercial stands occur from sea level to about 450 m, but scattered trees rise to a treeline at 600 to 1,000 m.

The coastal forests are characterized by steep, rough topography. In many areas only a narrow band of trees exists between ocean and tundra on snow-clad mountains above. Narrow waterways with steep forested slopes, rugged mountains, and glaciers creeping through rock-strewn valleys offer a wealth of recreation opportunities to Alaskans and tourists.

The climate is cool and cloudy in summer, and the winters are mild. Snowfall may be heavy in some forested areas in the northern part, but much of the precipitation falls as rain. Annual precipitation varies from as much as 5,640 mm on the outer coast of the southernmost islands to 630 mm at Homer on the boundary between the coastal and interior forests. The mean annual temperature in the coastal forests ranges from 8° C (46° F) at Ketchikan to 3° C (37° F) at Cordova. Summer temperatures range from 13° to 16° C (upper 50s° F) and winter temperatures for the coldest month range from –6° C (low 20s° F) to +2° C (mid-30s° F).

1. Coastal Spruce–Hemlock Forests

The southern part of the coastal forests is composed primarily of Western hemlock and Sitka spruce with a scattering of mountain hemlock, Western red cedar, and Alaska cedar. Red alder is common along streams and beach fringes and on soils recently disturbed by logging and landslides. Black cottonwood grows on the floodplains of major rivers and recently deglaciated areas on the mainland. Subalpine fir and Pacific silver fir occur occasionally at treeline and near sea level but are not abundant enough to be of commercial value. Because of the high rainfall and high humidity, mosses grow in great profusion on the ground, on fallen logs, and on the lower branches of trees, as well as in forest openings.

In poorly drained areas at low elevations, open muskegs of low shrubs, sedges, grasses, and mosses are common. These areas are treeless or may have

a few scattered shrubby trees of shore pine, Western hemlock, mountain hemlock, Alaska cedar, and Sitka spruce.

In the northern and western sections of coastal forests, the composition of the tree species changes. Western red cedar is not found north of Frederick Sound, and Alaska cedar drops out at Prince William Sound. Cottonwood is extensive along some of the glacial outwash rivers and becomes commercially important in the Haines area and on the alluvial terraces to the west. Western hemlock becomes less important westward but is found as far north as Cook Inlet. Only Sitka spruce remains as an important tree in the coastal forests west of Cook Inlet and the lone conifer on Afognak and Kodiak islands. Douglas fir, which is characteristic of the coastal forests of Oregon, Washington, and southern British Columbia, does not reach Alaska except as an introduced species.

The common trees and shrubs of the coastal forests are the following:

Trees

Sitka spruce	*Picea sitchensis*
Western hemlock	*Tsuga heterophylla*
Mountain hemlock	*Tsuga mertensiana*
Alaska cedar	*Chamaecyparis nootkatensis*
Red alder	*Alnus rubra*
Black cottonwood	*Populus trichocarpa*

Common Shrubs

Sitka alder	*Alnus sinuata*
Salal	*Gaultheria shallon*
Rusty menziesia	*Menziesia ferruginea*
Devil's club	*Oplopanax horridus*
Stink currant	*Ribes bracteosum*
Trailing black currant	*Ribes laxiflorum*
Western thimbleberry	*Rubus parviflorus*
Salmonberry	*Rubus spectabilis*
Barclay willow	*Salix barclayi*
Scouler willow	*Salix scouleriana*
Sitka willow	*Salix sitchensis*
Pacific red elder	*Sambucus racemosa*
Alaska blueberry	*Vaccinium alaskaense*
Dwarf blueberry	*Vaccinium cespitosum*
Early blueberry	*Vaccinium ovalifolium*
Red huckleberry	*Vaccinium parvifolium*
High-bush cranberry	*Viburnum edule*

Interior Forests

The white spruce–paper birch forest, extending from the Kenai Peninsula to the south slopes of the Brooks Range and westward nearly to the Bering Sea, is called the boreal forest or *taiga*, the Russian equivalent. These forests cover about 32 percent of the area or about 42.4 million hectares (106 million acres) of Alaska. However, only about one fifth, or 9 million hectares (22.5 million acres), is classified as commercial forest land.

Characteristic forest stands are found in the Tanana and Yukon river valleys. Here, in contrast to the coast, climatic conditions are extreme. Mean annual temperature is –7° C to –10° C (20 to 30° F) but winter temperatures below –40° C (–40° F) are common, and the coldest month averages –23° to –29° C (–10 to –20° F). In contrast, summer temperatures may reach above 30° C (90s F), and the warmest month of the year has an average temperature of 16° C (60° F). Permanently frozen ground (permafrost) is scattered in the southern part of the interior forests and is nearly continuous in the northern sections. Although precipitation is light, 150 to 300 mm per year, evaporation is low, and permafrost forms an impervious layer so that bogs and wet areas are common. Snowfall averages 140 cm per year at Fairbanks, and snow cover usually persists from mid-October until mid-to-late April. Day length is also extreme in the boreal forest, with nearly 24 hours of daylight available for plant growth in June but only a few hours of sunlight during the winter months. Forest fires have always been an important aspect of the environment of the interior forests, but the 2004 and 2005 fire seasons were among the worst on record. In 2004, over 2.6 million hectares (6.6 million acres) burned, while in the summer of 2005, nearly 1.8 million hectares (over 4.4 million acres) went up in flames.

The vegetation types in interior Alaska form a mosaic of patterns that is related in part to fire history, to slope and aspect, and to the presence or absence of permafrost. Most forest stands are mixtures of two or more tree species but are usually classified by the dominant species.

2. Closed Spruce–Hardwood Forests

White Spruce Type—In general, the best commercial stands of white spruce are found on warm, dry, south-facing hillsides and adjacent to rivers where drainage is good and permafrost is absent. These stands are rather open under the canopy but may contain shrubs of rose, alder, and willow. The forest floor is usually carpeted with a thick moss mat. Stands in which commercial white spruce are dominant occupy 5.1 million hectares (12.8 million acres) in interior Alaska.

Common trees and shrubs of the white spruce forest type include:

Trees

White spruce	*Picea glauca*
Alaska paper birch	*Betula neoalaskana*
Balsam poplar	*Populus balsamifera*

Common Shrubs

Red-fruit bearberry	*Arctous rubra*
Crowberry	*Empetrum nigrum*
Narrow-leaf Labrador tea	*Ledum decumbens*
American red currant	*Ribes triste*
Prickly rose	*Rosa acicularis*
Felt-leaf willow	*Salix alaxensis*
Little-tree willow	*Salix arbusculoides*
Bebb willow	*Salix bebbiana*
Buffaloberry	*Shepherdia canadensis*
Mountain cranberry	*Vaccinium vitis-idaea*
Bog blueberry	*Vaccinium uliginosum*
High-bush cranberry	*Viburnum edule*

Occasional to Rare Shrubs

Kinnikinnik	*Arctostaphylos uva-ursi*
Resin birch	*Betula glandulosa*
Rusty menziesia	*Menziesia ferruginea*
Bush cinquefoil	*Dasiphora fruticosa*
Gray-leaf willow	*Salix glauca*
Halberd willow	*Salix hastata*
Richardson willow	*Salix richardsonii*
Park willow	*Salix pseudomonticola*
Tall blueberry willow	*Salix pseudomyrsinites*
Scouler willow	*Salix scouleriana*
Dwarf blueberry	*Vaccinium cespitosum*

Recent Burns—Because of extensive burns during the past 100 years, large areas of the Interior are in various stages of forest succession. The succession that follows fire is varied and depends upon topography, previous vegetation, severity of burn, and available seed source at the time of burn. In general, fires are followed by a shrubby stage consisting primarily of light-seeded willows.

The most important woody plants to follow immediately after fire include:

Common Shrubs

Narrow-leaf Labrador tea	*Ledum decumbens*

Labrador tea	*Ledum groenlandicum*
Prickly rose	*Rosa acicularis*
Little-tree willow	*Salix arbusculoides*
Barclay willow	*Salix barclayi*
Bebb willow	*Salix bebbiana*
Scouler willow	*Salix scouleriana*
Dwarf blueberry	*Vaccinium cespitosum*
Mountain cranberry	*Vaccinium vitis-idaea*

Occasional or Rare Shrubs

Siberian alder	*Alnus fruticosa*
Sitka alder	*Alnus sinuata*
Thin-leaf alder	*Alnus tenuifolia*
Red-fruit bearberry	*Arctous rubra*
Kinnikinnik	*Arctostaphylos uva-ursi*
Crowberry	*Empetrum nigrum*
Bush cinquefoil	*Dasiphora fruticosa*
American red currant	*Ribes triste*
Buffaloberry	*Shepherdia canadensis*
Steven spirea	*Spiraea stevenii*
Bog blueberry	*Vaccinium uliginosum*

Quaking Aspen Type—After fire and a willow stage, fast-growing aspen stands develop in upland areas on south-facing slopes. The aspen mature in 60 to 80 years and are eventually replaced by white spruce, except in excessively dry sites where they can persist. Occasionally aspen stands follow fire on well-drained lowland river terraces and, in these situations, are usually replaced by black spruce in the successional sequence. Stands with aspen dominant occupy about 960,000 hectares (2.4 million acres) in central Alaska. Woody plants occurring in the aspen type are as follows:

Trees

Quaking aspen	*Populus tremuloides*
White spruce	*Picea glauca*
Black spruce	*Picea mariana*

Common Shrubs

Kinnikinnik	*Arctostaphylos uva-ursi*
Prickly rose	*Rosa acicularis*
Bebb willow	*Salix bebbiana*
Scouler willow	*Salix scouleriana*
Buffaloberry	*Shepherdia canadensis*
Mountain cranberry	*Vaccinium vitis-idaea*

Occasional to Rare Shrubs

Red-fruit bearberry	*Arctous rubra*
Alaska sagebrush	*Artemisia alaskana*
Fringed sagebrush	*Artemisia frigida*
Resin birch	*Betula glandulosa*
Crowberry	*Empetrum nigrum*
Common juniper	*Juniperus communis*
Labrador tea	*Ledum groenlandicum*
American red raspberry	*Rubus idaeus*
Dwarf blueberry	*Vaccinium cespitosum*
Bog blueberry	*Vaccinium uliginosum*
High-bush cranberry	*Viburnum edule*

Paper Birch Type—Alaska paper birch is the common invading tree after fire on east- and west-facing slopes and occasionally on north slopes and flat areas. This species occurs either in pure stands or more often mixed with white spruce, aspen, or black spruce. Shrubs may be similar to those under aspen, but usually Labrador tea and mountain cranberry are more common. Alaska paper birch may be 18–24 m tall and have diameters up to 46 cm, but an average diameter of 20 to 22 cm is more common in interior Alaska birch stands. Stands dominated by Alaska paper birch occupy about 2 million hectares (5 million acres) of interior forests and are especially widespread in the Susitna River valley. Trees and shrubs occurring in paper birch type forests are the following:

Trees

Alaska paper birch	*Betula neoalaskana*
White spruce	*Picea glauca*
Black spruce	*Picea mariana*

Common Shrubs

Narrow-leaf Labrador tea	*Ledum decumbens*
Labrador tea	*Ledum groenlandicum*
American red currant	*Ribes triste*
Prickly rose	*Rosa acicularis*
Bebb willow	*Salix bebbiana*
Scouler willow	*Salix scouleriana*
Barclay willow	*Salix barclayi*
Mountain cranberry	*Vaccinium vitis-idaea*
High-bush cranberry	*Viburnum edule*
Dwarf blueberry	*Vaccinium cespitosum*

Occasional to Rare Shrubs

Crowberry	*Empetrum nigrum*
Rusty menziesia	*Menziesia ferruginea*
Devil's club	*Oplopanax horridus*
Northern black currant	*Ribes hudsonianum*
American red raspberry	*Rubus idaeus*
Pacific red elder	*Sambucus racemosa*
Greene mountain ash	*Sorbus scopulina*

Balsam Poplar Type—Another tree species of importance within the closed spruce–hardwood forest in interior Alaska is balsam poplar, which reaches its greatest size and abundance on the floodplain of meandering glacial rivers. It invades sandbars and grows rapidly to heights of 24–30 m and diameters of 60 cm before being replaced by white spruce. Balsam poplar also occurs in small groves near the altitudinal and latitudinal limits of trees in the Alaska Range and north of the Brooks Range. Commercial stands occupy 840,000 hectares (2.1 million acres), primarily along the Yukon, Tanana, Susitna, and Kuskokwim rivers. In the Susitna Valley, balsam poplar is often replaced in this type of forest by black cottonwood or by hybrids between the two. The woody plants of this type include:

Trees

Balsam poplar	*Populus balsamifera*
Black cottonwood	*Populus trichocarpa*
White spruce	*Picea glauca*

Common Shrubs

Siberian alder	*Alnus fruticosa*
Sitka alder	*Alnus sinuata*
Thin-leaf alder	*Alnus tenuifolia*
Little-tree willow	*Salix arbusculoides*
Felt-leaf willow	*Salix alaxensis*
Prickly rose	*Rosa acicularis*
High-bush cranberry	*Viburnum edule*

Occasional to Rare Shrubs

Silverberry	*Eleagnus commutata*
Bush cinquefoil	*Dasiphora fruticosa*
Tall blueberry willow	*Salix pseudomyrsinites*
Scouler willow	*Salix scouleriana*
Buffaloberry	*Shepherdia canadensis*

3. Open, Low-Growing Spruce Forests

On north-facing slopes and poorly drained lowlands, forest succession leads to open black spruce and bogs, usually underlain by permafrost. Black spruce are slow-growing and seldom exceed 20 cm in diameter and are usually much smaller; a tree 5 cm in diameter is often 100 years in age. Black spruce comes in profusely after fire because its persistent cones open after a fire and spread abundant seed over the burned areas. A thick moss mat, often of sphagnum mosses, sedges, grasses, and heath or ericaceous shrubs, usually makes up the subordinate vegetation of the open black spruce stands. Associated with black spruce in wet bottomlands is the slow-growing tamarack. As with black spruce, tamarack is of little commercial value, seldom reaching a diameter of more than 15 cm. The woody plants of these low-growing spruce forests include:

Trees	
Black spruce	*Picea mariana*
Tamarack	*Larix laricina*
Alaska paper birch	*Betula neoalaskana*
White spruce	*Picea glauca*
Common Shrubs	
Red-fruit bearberry	*Arctous rubra*
Crowberry	*Empetrum nigrum*
Labrador tea	*Ledum groenlandicum*
Prickly rose	*Rosa acicularis*
Little-tree willow	*Salix arbusculoides*
Bebb willow	*Salix bebbiana*
Gray-leaf willow	*Salix glauca*
Blueberry willow	*Salix myrtillifolia*
Diamond-leaf willow	*Salix pulchra*
Scouler willow	*Salix scouleriana*
Bog blueberry	*Vaccinium uliginosum*
Mountain cranberry	*Vaccinium vitis-idaea*
Occasional to Rare Shrubs	
Resin birch	*Betula glandulosa*
Dwarf arctic birch	*Betula nana*
Bush cinquefoil	*Dasiphora fruticosa*
Narrow-leaf Labrador tea	*Ledum decumbens*
Rusty menziesia	*Menziesia ferruginea*
Bog cranberry	*Oxycoccus microcarpus*
Dwarf blueberry	*Vaccinium cespitosum*

4. Treeless Bogs

Coastal Areas—Treeless areas occur within coastal forests in depressions, flat areas, and on some gentle slopes where drainage is poor. The vegetation is variable but most commonly consists of a thick sphagnum moss mat, sedges, rushes, low shrubs, and fruticose lichens. This type is locally called muskeg. Often a few slow-growing, poorly formed shore pine, Western hemlock, or Alaska cedar are scattered on the drier sites. In more exposed situations and in the driest areas, shrubs may be dominant over the sedge and herbaceous mat. Ponds are often present in the peaty substrate. Characteristic shrubs of the coastal Alaska bogs include:

Bog rosemary	*Andromeda polifolia*
Crowberry	*Empetrum nigrum*
Common juniper	*Juniperus communis*
Bog kalmia	*Kalmia microphylla*
Labrador tea	*Ledum groenlandicum*
Rusty menziesia	*Menziesia ferruginea*
Bog cranberry	*Oxycoccus microcarpus*
Barclay willow	*Salix barclayi*
Under-green willow	*Salix commutata*
Bog blueberry	*Vaccinium uliginosum*
Mountain cranberry	*Vaccinium vitis-idaea*

Interior Areas—Within the boreal forest are extensive bogs where conditions are too wet for tree growth. North of the Alaska Range in unglaciated areas, they occur on old river terraces and outwash, in filling ponds and old sloughs, and occasionally on gentle north-facing slopes. They are common south of the Alaska Range on fine clay soils formed in former glacial lake basins and on morainal soils within the glaciated area. They are also common on extensive flat areas of the lower Yukon and Kuskokwim rivers.

The vegetation of these bogs consists of varying amounts of grasses, sedges, and mosses, especially sphagnum. Often the surface is made uneven by string-like ridges. Much of the surface of these bogs is too wet for shrubs, but on drier peat ridges are a number of heath or ericaceous shrubs, willows, and dwarf birches. Woody plants of the treeless bogs include the following:

Common Shrubs

Bog rosemary	*Andromeda polifolia*
Resin birch	*Betula glandulosa*
Dwarf arctic birch	*Betula nana*
Leatherleaf	*Chamaedaphne calyculata*

Narrow-leaf Labrador tea	*Ledum decumbens*
Labrador tea	*Ledum groenlandicum*
Sweetgale	*Myrica gale*
Bog cranberry	*Oxycoccus microcarpus*
Barclay willow	*Salix barclayi*
Alaska bog willow	*Salix fuscescens*
Low blueberry willow	*Salix myrtillifolia*
Diamond-leaf willow	*Salix pulchra*
Bog blueberry	*Vaccinium uliginosum*
Mountain cranberry	*Vaccinium vitis-idaea*

Occasional to Rare Shrubs

Siberian alder	*Alnus fruticosa*
Sitka alder	*Alnus sinuata*
Thin-leaf alder	*Alnus tenuifolia*
Red-fruit bearberry	*Arctous rubra*
Bush cinquefoil	*Dasiphora fruticosa*
Crowberry	*Empetrum nigrum*
Gray-leaf willow	*Salix glauca*
Net-leaf willow	*Salix reticulata*
Steven spirea	*Spiraea stevenii*

5. Shrub Thickets

Coastal Alder Thickets—Dense thickets of shrubs occur in a number of sites in all the major vegetation zones in Alaska. In coastal Alaska, extensive alder thickets grow between beach and forest and between treeline and alpine tundra meadows. Thickets also grow from treeline downward in avalanche tracks and along streams. Shrub thickets are also common in southeastern Alaska in many clearcut areas. Alder thickets are almost impenetrable because the boles of shrubs tend to grow horizontally as well as vertically. To travel through the thicket is even worse; the spiny devil's club and salmonberry are frequently present. Beneath the alders often lies a well-developed grass and fern layer, as well as a number of forbs and shrubs. The most common woody plants in this type are the following:

Sitka alder	*Alnus sinuata*
Luetkea	*Luetkea pectinata*
Rusty menziesia	*Menziesia ferruginea*
Oregon crab apple	*Malus fusca*
Devil's club	*Oplopanax horridus*
Stink currant	*Ribes bracteosum*

Trailing black currant	*Ribes laxiflorum*
Nootka rose	*Rosa nutkana*
Western thimbleberry	*Rubus parviflorus*
Salmonberry	*Rubus spectabilis*
Barclay willow	*Salix barclayi*
Scouler willow	*Salix scouleriana*
Sitka willow	*Salix sitchensis*
Pacific red elder	*Sambucus racemosa*
Sitka mountain ash	*Sorbus sitchensis*
Alaska blueberry	*Vaccinium alaskaense*
Dwarf blueberry	*Vaccinium cespitosum*
Early blueberry	*Vaccinium ovalifolium*
Red huckleberry	*Vaccinium parvifolium*

Floodplain Thickets—Floodplain thickets are found on the floodplains of rivers. Although somewhat different in species composition, this type is similar from the rivers of the southern coastal areas to the broad, braided rivers north of the Brooks Range. This type forms on newly exposed alluvial deposits that are periodically flooded. Thickets develop quickly and may reach heights of 4.5 to 6 m in south and central Alaska and 1.5 to 3 m along rivers north of the Brooks Range. The dominant shrubs of this type are willows and occasionally alders, with some lower shrubs under the canopy. The shrubs of this type include the following:

Siberian alder	*Alnus fruticosa*
Thin-leaf alder	*Alnus tenuifolia*
Sitka alder	*Alnus sinuata*
Red-osier dogwood	*Cornus stolonifera*
Silverberry	*Eleagnus commutata*
Sweetgale	*Myrica gale*
Prickly rose	*Rosa acicularis*
American red raspberry	*Rubus idaeus*
Felt-leaf willow	*Salix alaxensis*
Little-tree willow	*Salix arbusculoides*
Barclay willow	*Salix barclayi*
Bebb willow	*Salix bebbiana*
Under-green willow	*Salix commutata*
Gray-leaf willow	*Salix glauca*
Halberd willow	*Salix hastata*
Sandbar willow	*Salix interior*
Barren-ground willow	*Salix niphoclada*

Richardson willow	*Salix richardsonii*
Pacific willow	*Salix lasiandra*
Park willow	*Salix pseudomonticola*
Tall blueberry willow	*Salix pseudomyrsinites*
Diamond-leaf willow	*Salix pulchra*
Setchell willow	*Salix setchelliana*
Sitka willow	*Salix sitchensis*
Buffaloberry	*Shepherdia canadensis*
High-bush cranberry	*Viburnum edule*

Birch–Alder–Willow Thickets—A third type of shrub thicket occurs near treeline in interior Alaska and beyond treeline in extensive areas of the Alaska and Seward peninsulas. It consists of resin birch, alder, and several willow species, usually forming thickets 1 to 3 m tall. The thickets may be extremely dense or they may be open and interspersed with reindeer lichens, low heath-type shrubs, or patches of alpine tundra. Alders tend to occupy wetter sites, the birch the mesic sites, and tundra openings the drier or wind-exposed areas. The type extends below treeline where it is often associated with widely spaced white spruce. Shrubs of this type include the following:

Siberian alder	*Alnus fruticosa*
Sitka alder	*Alnus sinuata*
Alpine bearberry	*Arctous alpina*
Resin birch	*Betula glandulosa*
Dwarf arctic birch	*Betula nana*
Bush cinquefoil	*Dasiphora fruticosa*
Crowberry	*Empetrum nigrum*
Narrow-leaf Labrador tea	*Ledum decumbens*
Barclay willow	*Salix barclayi*
Under-green willow	*Salix commutata*
Alaska bog willow	*Salix fuscescens*
Diamond-leaf willow	*Salix pulchra*
Richardson willow	*Salix richardsonii*
Net-leaf willow	*Salix reticulata*
Steven spirea	*Spiraea stevenii*
Bog blueberry	*Vaccinium uliginosum*
Mountain cranberry	*Vaccinium vitis-idaea*

Tundra

Tundra vegetation can be divided into three main types: moist tundra, wet tundra, and alpine tundra. Within each of these major types are mosaics of subtypes related to differences in topography, slope, aspect, and substrate.

6. Moist tundra

Moist tundra occupies the foothills and lower elevations of the Alaska Range as well as extensive areas on the Seward and Alaska peninsulas, the Aleutian Islands, and the islands of the Bering Sea. The type varies from almost continuous and uniformly developed cottongrass (*Eriophorum* species) tussocks with sparse growth of other sedges and dwarf shrubs to stands where tussocks are scarce or lacking and dwarf shrubs are dominant. Over wide areas in arctic Alaska, the cottongrass tussock type is the most widespread of all vegetation types. In northern areas the type is often dissected by polygonal patterns created by underlying ice wedges. On the Aleutian Islands, the type consists of tall grass meadows interspersed with a dense, low heath–shrub type. The shrubs in this type, found from the Aleutian Islands to the north slope of the Brooks Range, include the following:

Siberian alder	*Alnus fruticosa*
Alpine bearberry	*Arctous alpina*
Resin birch	*Betula glandulosa*
Dwarf arctic birch	*Betula nana*
Four-angled cassiope	*Cassiope tetragona*
Entire-leaf mountain avens	*Dryas integrifolia*
White mountain avens	*Dryas octopetala*
Narrow-leaf Labrador tea	*Ledum decumbens*
Alpine azalea	*Loiseleuria procumbens*
Bog cranberry	*Oxycoccus microcarpus*
Aleutian mountain heather	*Phyllodoce aleutica*
Lapland rosebay	*Rhododendron lapponicum*
Arctic willow	*Salix arctica*
Barclay willow	*Salix barclayi*
Barratt willow	*Salix barrattiana*
Chamisso willow	*Salix chamissonis*
Under-green willow	*Salix commutata*
Alaska bog willow	*Salix fuscescens*
Gray-leaf willow	*Salix glauca*
Richardson willow	*Salix richardsonii*
Diamond-leaf willow	*Salix pulchra*

Arctic seashore willow	*Salix ovalifolia*
Polar willow	*Salix polaris*
Net-leaf willow	*Salix reticulata*
Least willow	*Salix rotundifolia*
Steven spirea	*Spiraea stevenii*
Kamchatka rosebay	*Therorhodion camtschaticum*
Bog blueberry	*Vaccinium uliginosum*
Mountain cranberry	*Vaccinium vitis-idaea*

7. Wet Tundra

The wet tundra type, as shown on the vegetation map, also includes the low coastal marshes of southern Alaska. This type is most extensive along the coastal plain north of the Brooks Range, the northern part of the Seward Peninsula, and on the broad Yukon delta. It is usually found in areas with many shallow lakes and little topographic relief. Standing water is almost always present in the summer, and in the northern parts, permafrost is close to the surface. Microrelief is provided by peat ridges and polygonal features related to frost action and ice wedges. The vegetation is primarily a sedge and cottongrass mat, usually not formed into tussocks. The few woody plants occur on the driest sites where the microrelief raises them above standing water. The shrubs in this type include the following:

Bog rosemary	*Andromeda polifolia*
Resin birch	*Betula glandulosa*
Dwarf arctic birch	*Betula nana*
Narrow-leaf Labrador tea	*Ledum decumbens*
Bog cranberry	*Oxycoccus microcarpus*
Alaska bog willow	*Salix fuscescens*
Diamond-leaf willow	*Salix pulchra*
Net-leaf willow	*Salix reticulata*
Richardson willow	*Salix richardsonii*
Arctic seashore willow	*Salix ovalifolium*
Bog blueberry	*Vaccinium uliginosum*
Mountain cranberry	*Vaccinium vitis-idaea*

8. Alpine Tundra

A zone of alpine tundra exists in all the mountain ranges of Alaska and on exposed ridges in the arctic and southwestern coastal areas. Much of this type consists of barren rocks, but interspersed between the rocks and rubble are low mat plants, both herbaceous and shrubby. Dominant in northern areas and in the Alaska Range are low mats of white mountain avens, which may cover

entire ridges and slopes along with many mat-forming herbs, such as moss campion (*Silene acaulis*), black oxytrope (*Oxytropis nigrescens*), arctic sandwort (*Minuartia arctica*), and several grasses and sedges. In the southeastern coastal mountains and the Aleutians, the most important plants are the low heath shrubs, especially cassiopes and mountain heathers. They are most abundant where snow accumulates in the winter and lingers into late spring. On the Aleutian Islands, this type consists primarily of crowberry, bog blueberry, mountain cranberry, alpine azalea, and several dwarf willows. Shrubs in this type throughout its range in Alaska include the following:

Alpine bearberry	*Arctous alpina*
Resin birch	*Betula glandulosa*
Dwarf arctic birch	*Betula nana*
Alaska cassiope	*Cassiope lycopodioides*
Mertens cassiope	*Cassiope mertensiana*
Four-angled cassiope	*Cassiope tetragona*
Diapensia	*Diapensia lapponica*
White mountain avens	*Dryas octopetala*
Entire-leaf mountain avens	*Dryas integrifolia*
Crowberry	*Empetrum nigrum*
Starry cassiope	*Harrimanella stelleriana*
Alpine azalea	*Loiseleuria procumbens*
Narrow-leaf Labrador tea	*Ledum decumbens*
Luetkea	*Luetkea pectinata*
Aleutian mountain heather	*Phyllodoce aleutica*
Blue mountain heather	*Phyllodoce caerulea*
Red mountain heather	*Phyllodoce empetriformis*
Lapland rosebay	*Rhododendron lapponicum*
Arctic willow	*Salix arctica*
Chamisso willow	*Salix chamissonis*
Alaska bog willow	*Salix fuscescens*
Arctic seashore willow	*Salix ovalifolia*
Skeleton-leaf willow	*Salix phlebophylla*
Polar willow	*Salix polaris*
Diamond-leaf willow	*Salix pulchra*
Net-leaf willow	*Salix reticulate*
Least willow	*Salix rotundifolia*
Kamchatka rosebay	*Therorhodion camtschaticum*
Dwarf blueberry	*Vaccinium cespitosum*
Bog blueberry	*Vaccinium uliginosum*
Mountain cranberry	*Vaccinium vitis-idaea*

Pine Family

Pinaceae

Conifers, or softwoods, are economically the most important group of trees in Alaska. Many have tall, straight trunks and narrow crowns, except where dwarfed near the northern and altitudinal limits of tree growth. These narrow-leaf evergreens make up nearly all the trees of the coastal forests of southeast Alaska and most of the timber of interior forests. They furnish nearly all the state's lumber, pulpwood, building logs, and other wood products.

These cone-bearing trees are resinous softwoods with needle-like or scale-like evergreen leaves with seeds exposed in woody cones. Pollen is borne in small male cones on the same plant.

The pine family is well represented in Alaska by five genera and nine species of trees with narrow, mostly long, needle-like leaves. The cones have many cone-scales, each bearing two long-winged seeds at the base. Characteristics of the five genera and names of their Alaska species are summarized here for ready identification.

Pine (*Pinus*), one species, lodgepole pine (*P. contorta*), with two subspecies. Two needles in a relatively long and stiff bundle or cluster with sheath at base. Cones with many prickly cone-scales.

Tamarack or Alaska larch (*Larix*) is the only Alaska conifer to shed its leaves in fall and be leafless in winter. There is one species, *L. laricina*, with slender, flexible needles borne twelve to twenty in a cluster on short, stout spur twigs (or singly on leading twigs).

Spruce (*Picea*), three species: black, white, and Sitka spruce. Needles sharp-pointed and stiff, either four-angled or flattened and slightly keeled, extending out on all sides of twig. There is no leafstalk, but each leaf is attached on a small peg-like projection of the twig. Older twigs without needles are rough because of these projections. Cut branches of spruce and hemlock shed their needles promptly upon drying. The cones hang down. When preparing specimens,

immersion of freshly cut twigs in boiling water for a few minutes before pressing reduces shedding of needles.

Hemlock (*Tsuga*), two species, Western and mountain hemlock. Needles short, blunt, soft and not stiff, flat or slightly keeled, with short leafstalks, spreading in two rows or curving upward. As in spruce, older twigs are slightly rough from the peg-like projections. Cones hang down.

Fir (*Abies*), two species, Pacific silver fir and subalpine fir. Needles flat and without leafstalks, often spreading in two rows or curving upward. Older twigs smooth with round leaf scars. Cones upright in highest branches of narrow, pointed crowns. Because the cone scales fall from the axis at maturity, intact, old cones are not found on or under the trees.

White spruce - *Picea glauca*

Needles

- 3/4 to 1 inch long, blue-green, four-angled with whitish lines on all sides;
- Rigid, pointed, but not sharp to the touch;
- Usually crowded on upper side of the branch.

Cones

- 1-1/2 to 2-1/2 inches long, light brown;
- Narrowly oblong, nearly stalkless, hanging down;
- Scales thin and flexible with smooth margins.

Bark

- Thin, scaly to smooth;
- Gray-brown, with white inner bark.

Size at maturity and life span

- 40 to 70 feet tall, 6 to 18 inches in diameter;
- Reaches 80 to 115 feet tall, 30 inches in diameter;
- Tree crown, narrow or spire-like;
- Can live to an age of 250 to 300 years.

Habitat and distribution

- From sea level to tree line on a wide variety of habitats;
- Throughout southcentral and interior Alaska east through Canada to Atlantic Ocean, from the northern tree line south to the Great Lakes.

White spruce hybridizes with Sitka spruce where their ranges overlap, forming Lutz spruce, Picea x lutzii. It shows characteristics intermediate between the two parent trees.

Black spruce - Picea mariana

Needles

- 1/2 inch long, light blue-green, four-angled with whitish lines on all sides;
- Blunt-pointed;
- Current year twigs with short red or brown hairs.

Cones

- 1 inch long, rounded and dark;
- Scales rigid and brittle, margins rounded to toothed;
- Stay on for several years, hang on short stalks.

Bark

- Thin, gray to blackish, becoming flaky with age;
- Inner bark is yellow.

Size at maturity and life span

- 15 to 30 feet tall and 3 to 6 inches in diameter, larger in ideal situations;
- Can reach 250 years in age.

Habitat and distribution

- Wet and cold sites on flats or north-facing slopes, also in bogs;
- Usually at lower elevations;
- Throughout southcentral and interior Alaska east through Canada to Atlantic Ocean, from the northern tree line south to the Great Lakes.

Tamarack - *Larix laricina*

Needles

- Deciduous, soft, flexible, 1 inch long;
- In clusters of 10 to 20 on short spur branches;
- Blue-green needles turn golden yellow and are shed in the fall.

Cones

- 1/2 inch long, dark brown;
- With about 20 rounded, finely toothed scales;
- Held upright on short stalks from horizontal twigs.

Bark

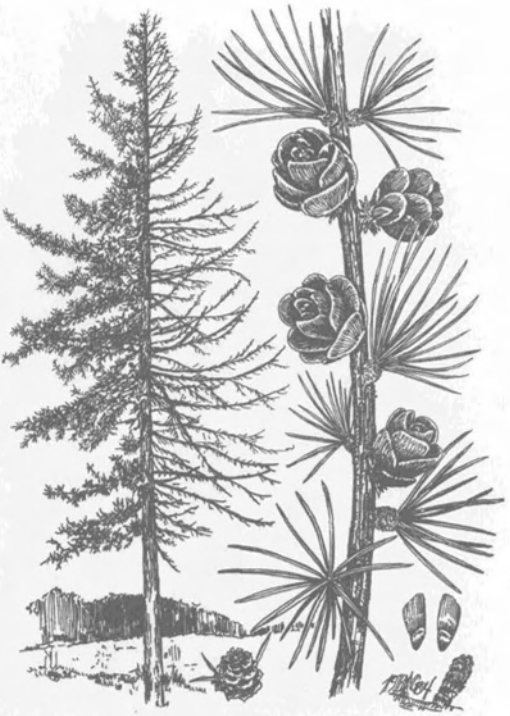
- Young trees with dark gray, smooth, thin;
- With age becomes reddish brown, scaly, exposing darker inner layer.

Size at maturity and life span

- 30 to 60 feet tall, 4 to 16 inches in diameter;
- 100 to 200 years.

Habitat and distribution

- Bogs, moist places, and along river drainages;
- From the northern slopes of the Alaska Range to the southern slopes of the Brooks Range, east across Canada to Atlantic Ocean, from the northern tree line south to the Great Lakes.



Willow Family

Salicaceae

The willow family (Salicaceae) contains the poplars, cottonwoods, and aspens (all in the genus *Populus* with three tree species in Alaska), and the willows (*Salix*), a large genus of thirty or more native species ranging in size from creeping or dwarf shrubs to large shrubs and small trees. Distinguishing characteristics of the willow family are:

(1) leaves borne singly (alternate), with margins evenly toothed or margins smooth without teeth (entire), but not lobed;
(2) flower clusters (catkins) composed of an axis bearing many small flowers, each subtended by a scale and appearing in early spring before or with the leaves;
(3) flowers without sepals or petals, of two kinds, male flowers with pollen and female flowers with seeds on male and female plants; and
(4) tiny seeds with long, white, cottony hairs, borne in small seed capsules mostly two-parted.

Poplars, cottonwoods, and aspens usually have broad leaves with petioles nearly as long as blades, stout twigs, and large winter buds with several scales exposed, resin (except in aspen), and a terminal bud. Willows usually have narrow leaves with very short petioles, slender or wiry twigs, and small winter buds covered by a single scale, without a terminal bud. Catkins in *Populus* hang down, while those of *Salix* are upright or slightly spreading. Flowers of *Populus* have deeply lobed scales that shed soon after the flowers open, a broad or cup-shaped disk, and ten to many stamens. Willow flowers have scales with or without teeth, persistent or late shedding, disk reduced usually to one small gland, and two to eight stamens.

Balsam poplar - *Populus balsamifera* subsp. *balsamifera*

Leaves

- 3 to 6 inches long, 2 to 4 inches wide;
- Broad at base, narrowing to a point at the tip;
- Dark shiny green above, rust-colored underneath;
- Swelling leaf buds are sweetly aromatic in the spring.

Fruit

- 2-parted capsules on 6 inch-long catkins contain numerous tiny cottony seeds.

Bark

- Young stems greenish to reddish brown;
- With age becomes thick and deeply furrowed.

Size at maturity and life span

- 80 to 100 feet tall, to 3 feet in diameter;
- 100 to 200 years.

Habitat and distribution

- River valleys and flood plains, alluvial fans, glacial outwash areas, lake shores;
- A shade-intolerant pioneer species;
- From interior Alaska across northern portions of North America.

Black cottonwood (*Populus balsamifera* subsp. *trichocarpa*) is nearly identical to balsam poplar except leaves are whitish underneath and it grows in south-coastal Alaska. Hybridizes with balsam poplar where ranges overlap. This is the largest broadleaf tree in Alaska.

Quaking aspen - *Populus tremuloides*

Leaves

- 1 to 3-1/2 inches long;
- Nearly round, pointed at tip and rounded at base, edged with many small rounded teeth;
- Shiny green, pale underneath;
- Leaf stalks flat, allowing leaves to tremble in the slightest breeze.

Fruit

- Capsules on 3 to 4 inch-long catkins;
- Capsules contain numerous tiny cottony seeds.

Bark

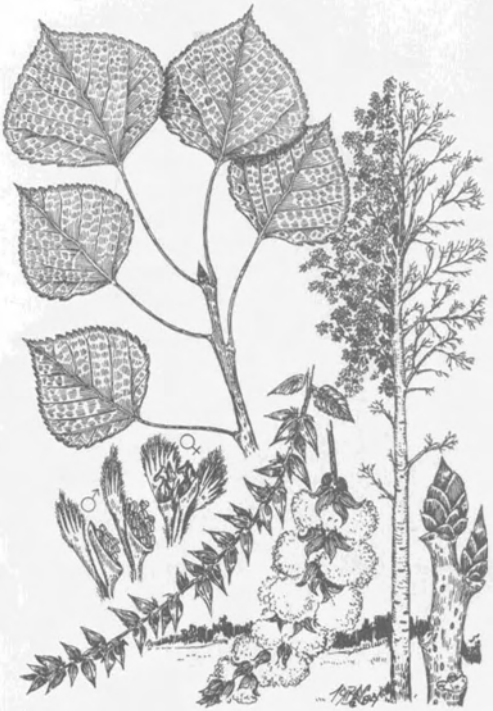
- Smooth, greenish white;
- Important wildlife food.

Size at maturity and life span

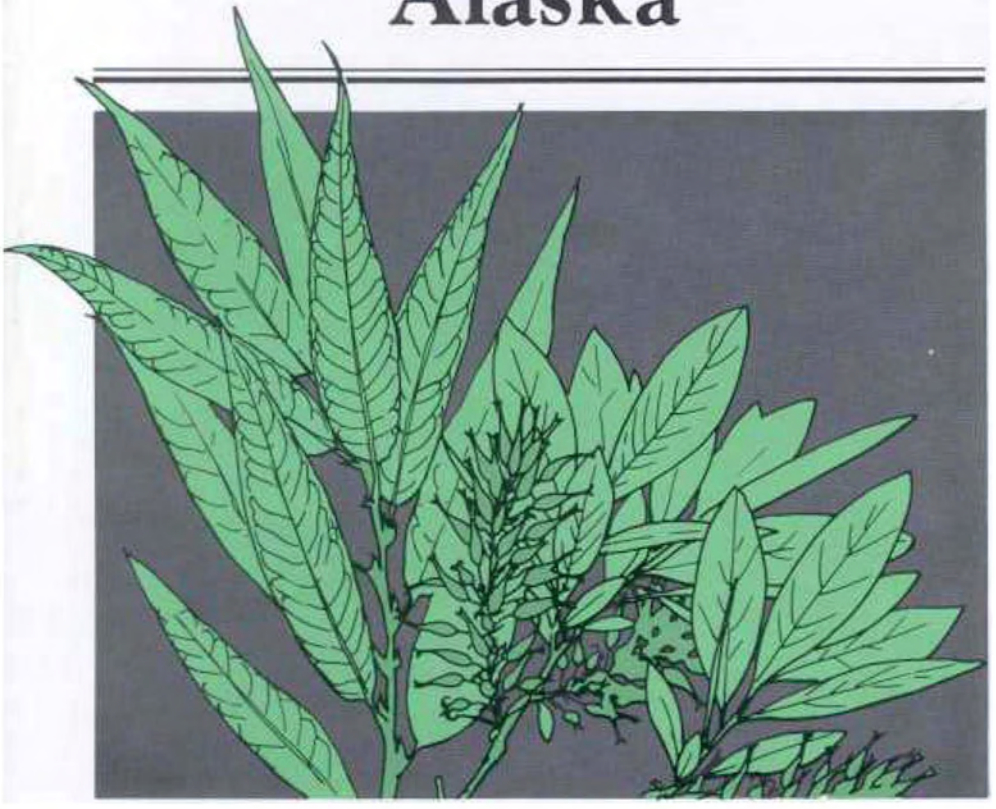
- 20 to 40 feet tall, 3 to 12 inches in diameter;
- 80 to 100 years average, 200 years maximum.

Habitat and distribution

- South-facing slopes and well drained benches;
- Propagates from root sprouting after disturbance;
- Throughout interior and southcentral Alaska, across Canada and south to New Mexico;
- Widest distribution of any native tree in North America.



Willow Varieties for Alaska



Cooperative Release by:
Alaska Department of
Natural Resources
Division of Agriculture
Alaska Plant Materials Center

U.S.D.A.
Soil Conservation Service

Conservation Plant Project

The **Conservation Plant Project** of the Alaska Plant Materials Center has been directed to screen and evaluate native and introduced plants for conservation purposes. These plant materials are specifically evaluated for land reclamation, wildlife habitat improvement and erosion control. After years of testing with cooperating agencies and individuals, the following willow collections have proven to be of value, and are worthy of variety release. The Plant Materials Center is not a production facility, therefore any sales of these varieties will be through commercial outlets or local conservation districts.

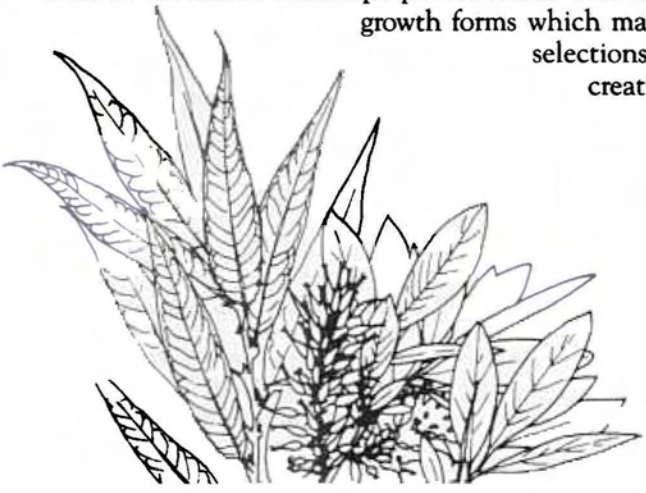
Why Grow Willow?

- Willows are very fast-growing, some can produce three to four feet of growth per year.

- Willows are very hardy and easy to grow. These new varieties are native to Alaska, and are adapted to the Alaskan environment. This means, in most cases, that heavy applications of fertilizer, and other cultural practices required by exotic species, will not be necessary.

- Willows provide wildlife with important sources of food and shelter. Willow is an important browse plant utilized by moose, hares and ptarmigan. Many game as well as non-game species use willow for cover and nesting.

- Willows are native landscape plants. Some willows have foliage and growth forms which make them excellent selections for landscaping, creating a natural look



'Roland' Pacific Willow
Salix lasiandra

Attributes

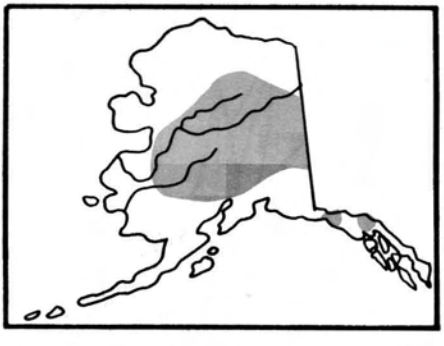
- Attractive Foliage
- Fast Growth
- Good Form
- Native Species

Potential Use

- Landscaping
- Screening
- Stream Protection & Bank Restoration
- Windbreaks & Shelterbelts
- Reclamation

Natural Range in Alaska

NOTE: The variety name **'Roland'** was selected to honor Roland Snodgrass, the 'Father of Agriculture' in Alaska. Snodgrass was a lifelong Alaskan farmer and supporter of agriculture. He also served as the Director of the Division of Agriculture from 1968 to 1970.



From L.A. Viereck and E.L. Little; *Alaska Trees and Shrubs*. U.S. Dept. of Agriculture, 1972, used with permission.

'Wilson' Bebb Willow
Salix bebbiana

Attributes

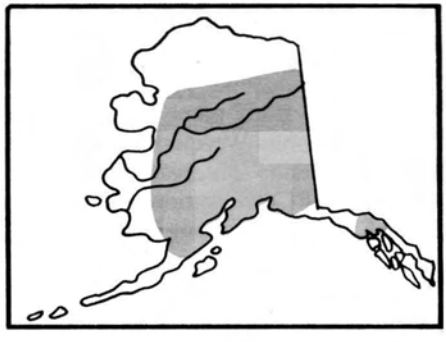
- High Stem Density
- Attractive Foliage & Growth Form
- Moderately Fast Growing
- Native Species

Potential Use

- Landscaping
- Living Fences
- Windbreaks & Shelterbelts
- Reclamation
- Screening

Natural Range in Alaska

NOTE: The variety name **'Wilson'** was selected to honor Jim Wilson. Wilson was the last Territorial Commissioner of the Alaska Department of Agriculture. After statehood, Wilson became the first Director of the Alaska Division of Agriculture. Wilson was also an active member of the Grange. He will forever be remembered as the designer of the "Mat-Maid" logo which is still used on all Matanuska Maid dairy products.



From L.A. Viereck and E.L. Little; *Alaska Trees and Shrubs*. U.S. Dept of Agriculture, 1972, used with permission.

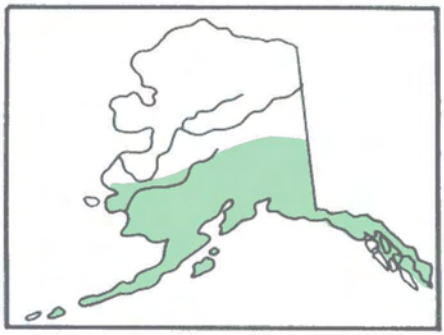
'Long' Barclay Willow
Salix barclayi

Attributes
- Attactive Foliage
- Fast Growth
- Native Species
- Good Form

Potential Use
- Windbreaks & Shelterbelts
- Reclamation
- Landscaping

Natural Range in Alaska

NOTE: The variety name **'Long'** was selected to honor Weymeth Long, the former State Conservationist with the Soil Conservation Service, U.S.D.A. in Alaska. Long served in this position from 1970 to 1983. During this period, Long was a prime supporter of the Alaska Plant Materials Center.



From L.A. Viereck and E.L. Little; *Alaska Trees and Shrubs*. U.S. Dept. of Agriculture, 1972, used with permission.

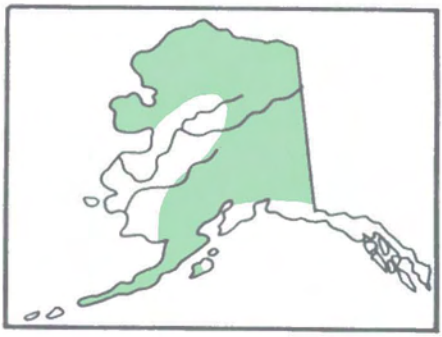
'Oliver' Barren Ground Willow
Salix brachycarpa

Attributes
- Good For Wildlife
- Attractive
- High Stem Density
- Good Form

Potential Use
- Landscaping
- Reclamation
- Hedge
- Windbreaks & Shelterbelts
- Erosion Control

Natural Range in Alaska

NOTE: The variety name **'Oliver'** was selected to honor William "Bart" Oliver. Oliver was the Soil Conservation Service's State Conservationist in Alaska from 1960 to 1965. As State Conservationist, he assisted in the formation of the Alaska Association of Soil Conservation Subdistricts now known as the Alaska Associations of Soil and Water Conservation Districts. He was also responsible for providing a mechanism so that Alaskan farmers could participate in the Goodyear Soil Conservation Award Program.



From L.A. Viereck and E.L. Little; *Alaska Trees and Shrubs*. U.S. Dept. of Agriculture, 1972, used with permission.

'Rhode' Feltleaf Willow
Salix alaxensis

Attributes
- Good For Wildlife
- Very Fast Growth
- Wide Natural Range

Potential Use
- Wildlife Planting
- Reclamation
- Windbreaks & Shelterbelts
- Streambank Restoration
- Erosion Control

Natural Range in Alaska

NOTE: The variety name **'Rhode'** was selected to honor Clarence J. Rhode, Regional Director of the U.S. Fish and Wildlife Service in Alaska from 1948 to 1958. Rhode has been credited with pioneering the use of aircraft as a wildlife management tool in Alaska.

From L.A. Viereck and E.L. Little; *Alaska Trees and Shrubs*. U.S. Dept. of Agriculture, 1972, used with permission.

Variety Selection Chart

Variety/Species	Region*					Wildlife	Windbreak	Reclamation	Landscaping	Screening	Remarks
	South-Central	Kenai Pen. & Kodiak	Interior (S. of Yukon R.)	Western	South-Eastern						
'Roland' Pacific willow	X	?	X	No	?	No	X	X	X	X	Not reported to be a browse species.
'Wilson' Bebb willow	X	X	X	X	?	X	X	X	X	X	May survive in Southeastern Alaska north of Juneau.
'Long' Barclay willow	X	X	X	?	X	X	X	X	X	X	
'Rhode' Feltleaf willow	X	X	X	?	X	X	X	X	No	No	
'Oliver' Barren ground willow	X	No	X	No	No	X	X	X	X	No	

onditions play a very critical part in plant survival. Even though these willow are native to Alaska, it would be incorrect to suggest urvive anywhere they are planted. Some area of use suggestions are based on natural range, not on actual testing.

if planted too closely to drainage lines.

Birch Family

Betulaceae

The birch family is represented in Alaska by two genera (*Betula* and *Alnus*), ten species, and intergrading varieties and hybrids. Distinguishing characters are (1) broad, alternate leaves (single leaf attached at each branch node), with sharp margins, usually with double teeth of two sizes; in alders, leaves often slightly wavy and lobed; (2) flower clusters (catkins) composed of an axis bearing many minute, greenish flowers; two to three flowers above each subtending scale appear in early spring before the leaves from buds partly formed the preceding summer; (3) unisexual flowers with minute calyx; male and female flowers on the same plant (monoecious); (4) male flowers with pollen in long, narrow catkins at end of twig and female flowers in short catkins on sides of twig; and (5) cone-like fruits, 1.2 to 5 cm long, of many nutlets ("seeds") and scales.

The tree birches of Alaska are easily recognized by their smooth, thin, white, pinkish, coppery brown, or purplish-brown bark that peels off in papery strips; the soft cone-like fruits shed, leaving a slender axis. Alders generally have smooth gray bark, which is not papery, and usually have some old, dead, hard, blackish or dark brown cone-like fruits remaining on the twigs. Birch twigs commonly have raised glandular dots and unstalked winter buds that are composed of overlapping scales. Alder twigs lack glands and have stalked winter buds with three exposed scales meeting at their edges or overlapping.

Paper birch - *Betula neoalaskana* (formerly *B. papyrifera* var. *humilis*)

Leaves

- 1-1/2 to 3 inches long, 1 to 2 inches wide;
- Broadly oval with long-pointed tip;
- Margins coarsely double-toothed;
- Yellow-green, paler yellowish-green underneath;
- Twigs with dense covering of resin dots.

Fruit

- Nutlets borne in short, greenish-brown, dry, 1 to 1-1/4 inch-long catkins;
- Nutlets tiny, with wings broader than the body.

Bark

- Red-brown on young trunks;
- Lightens with age;
- Smooth, thin, paper-like and peeling.

Size at maturity

- To 80 feet tall, 4 to 24 inches in diameter.

Habitat and distribution

- Common in a variety of habitats, often in mixed forests with black and white spruce;
- From interior Alaska across northern North America to the southwest side of Hudson Bay.

Kenai birch (*Betula kenaica*) is nearly identical to paper birch except for slightly smaller size, leaves, and fewer resin dots on twigs. This tree is endemic to Alaska.

Rose Family

Rosaceae

The rose family (Rosaceae) is well represented in Alaska by twenty-two species and eleven genera of woody plants among the state's sixty-five native species. Distinguishing characters are (1) leaves alternate, simple or pinnately or palmately compound, with paired stipules; (2) flowers regular, often large and showy or small and many, with cuplike base, five sepals mostly persistent, five petals mostly white or less commonly pink, purple, or yellow, many stamens, and usually one pistil with two- to five-celled ovary (often inferior), and two to five styles (sometimes many simple pistils); and (3) fruit variable, e.g., pome (apple) or drupe (plum), aggregate of many one-seeded fruits ("berry"), or many separate dry fruits. Numerous wild and cultivated fruits and ornamental plants belong to this family. Several native genera produce edible fruits, including serviceberry (*Amelanchier*), crab apple (*Malus*), and raspberry (*Rubus*). Others, such as mountain ash (*Sorbus*), mountain avens (*Dryas*), and spirea (*Spiraea*) are ornamentals. Species in the rose genus (*Rosa*) are both ornamental and edible.

Four native species of the rose family and a naturalized species grow to the size of small trees in Alaska. All belong to the apple subfamily and have juicy or mealy fruits resembling small apples. These species are Saskatoon serviceberry (*Amelanchier alnifolia*), Oregon crab apple (*Malus fusca*), Greene mountain ash (*Sorbus scopulina*), Sitka mountain ash (*Sorbus sitchensis*), and the naturalized European mountain ash (*Sorbus aucuparia*).