

**MACKENZIE
 WILLOW**
Salix prolixa Anderss.
 plant symbol = SAPR3

Contributed by: USDA NRCS Pullman Plant Materials Center, Pullman, Washington



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Alternate Names

diamond willow, yellow willow

Uses

Reclamation: Mackenzie willow is used for revegetation of riparian areas, native plant community restoration and wildlife food, cover and browse.

Livestock/Wildlife: All classes of livestock eat willows in the West, but cattle consume more than others because they frequent riparian areas. Mackenzie willow is palatable to livestock, but its importance in their diets is not reported.

Beavers prefer willows as food and building material. Ducks and grouse, other birds and small mammals eat willow shoots, catkins, buds and leaves.

Moose and elk use this species for both summer and winter forage and browse. Winter elk use may be heavy. Dense stands provide excellent thermal and hiding cover for many wildlife species. Songbirds use Mackenzie willow for nesting and feeding.

Ethnobotany: Native Americans and others have long used willows for basket making. Willows are also a well-known source of salacin, which is chemically closely related to aspirin. Willows have also been used by Native Americans for bows, arrows, scoops, fish traps and other items.

Other: Mackenzie willow is used in furniture and picture frames in Montana (and perhaps other places) where it is valued for its diamond shaped bud scars which are prominent after bark is stripped from the wood.

Status

Please consult the PLANTS Web site and your State Department of Natural Resources for this plant's current status (e.g. threatened or endangered species, state noxious status, and wetland indicator values).

Description

General: Mackenzie willow was named in honor of Alexander Mackenzie (1755?-1820), Scotch fur trader and explorer in Canada. The type specimen was collected along the Mackenzie River, which he discovered.

Mackenzie willow is a coarse multi-stemmed shrub that grows from 6 to 30 feet tall. Catkins usually appear with new leaves. Twigs of the current season are glabrous or very sparsely puberulent. Mature leaves are green above, pale and glaucous beneath. Margins are finely toothed except near the apex or sometimes inconspicuously toothed or entire. Stipules are present but are eventually deciduous.

Distribution: Mackenzie willow occurs in western Wyoming, western Montana, north to the Yukon Territory, west across central Idaho (north of the Snake River plains) and central Oregon to the east base of the Cascade Mountains in Oregon and Washington and in the valleys of southern British Columbia to southern Vancouver Island.

Habitat: It occurs on rocky stream and river edges to moist alluvial terraces from low to moderate elevations. It seems to be most productive on fine-textured soils with moderate to high levels of available water.

It is a pioneer or early seral species on newly exposed streambanks, sometimes replacing coyote willow (*S. exigua*). Stands occur also on well-developed soils, indicating Mackenzie willow is relatively long-lived.

Associated Species: Associated species include a widely scattered overstory of black cottonwood (*Populus trichocarpa*) or water birch (*Betula occidentalis*). Common willows are coyote willow (*S. exigua*), Drummond willow (*S. drummondiana*) and whiplash willow (*S. lasiandra*). Other species include redosier dogwood (*Cornus stolonifera*), Wood's rose (*Rosa woodsii*) and inland gooseberry (*Ribes setosum*). Beaked sedge (*Carex rostrata*) and horsetail (*Equisetum arvense*) are frequent understory species in the wettest stands.

Adaptation

Mackenzie willow is adapted to a wide variety of soil textures from coarse-textured, gravelly areas to silt loams.

Establishment

Mackenzie willow may be propagated via seed or cuttings. Seed is used to produce containerized plants. Cuttings may either be planted directly at the site or greenhouse planted to produce bareroot plants or containerized plants. On-site wild hardwood cutting collections may not root as well as nursery grown stock where growing conditions are maintained at a more optimum level.

Mackenzie willow should be established in the capillary zone in riparian revegetation plantings. Plantings should be protected with appropriate physical barriers such as wire cages or tree protector tubes where there is rodent or beaver activity.

Much information is available for willow establishment, primarily in riparian zones. See reference section.

Management

Mackenzie willow provides important streambank protection by effectively stabilizing soils. Heavy grazing in moist Mackenzie willow communities can lead to soil compaction, streambank sloughing, and damage to willow plants. Grazing is particularly detrimental to the establishment of willows. Plants recover rapidly when browsing is excluded.

Seed and Plant Production

Mackenzie willow is easily propagated with hardwood cuttings without use of rooting hormone. It can also be propagated with seed but seed must be collected as soon as the fruits ripen. Mature seed loses germination ability rapidly, so planting soon after collection is necessary. Moistened seed may be stored for up to a month if refrigerated in sealed containers. Seeds of willow are not known to exhibit dormancy. Some native plant propagators prefer seed propagation for added diversity of genetic material and less labor requirement for

handling of materials during collection, storage and propagation. (See reference section for production of hardwood cuttings in cutting blocks or stooling beds.)

Cultivars

'Rivar' Mackenzie willow was released as a cultivar in 1993 by the NRCS Pullman, WA Plant Materials Center for use in riparian revegetation projects in Eastern Washington, Eastern Oregon and North Idaho. 'Rivar' originated from an area along the Tucannon River near Starbuck, Washington at an elevation of 800 feet. Mature height is 12 feet and canopy width is 15 feet at Pullman, WA. 'Rivar' has a rapid growth rate, growing to a height of over 12 feet and a canopy width of nearly 8 feet in 3 years at Pullman. 'Rivar' will grow in moist sands and gravel to silt loam soils. It easily roots from hardwood cuttings without use of rooting hormone treatment. A rooting trial conducted at Pullman indicated rooting of over 80 percent of hardwood cuttings used in the study. 'Rivar' is available commercially.

Pests and Potential Problems

Poplar/willow borers are potential problems in stands of Mackenzie willow maintained for cutting production. Borers must be controlled prior to entering the stems. Decadent stems with borer infestation should be pruned from commercial cutting production sites. Consult local/state pesticide recommendations for further control.

Willows plantings, especially during establishment, can be damaged by rodents including beaver, muskrat, mice, voles, etc. cutting off or girdling stems.

Environmental Concerns

None noted.

References

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USDA, NRCS 2003. The PLANTS Database, Version 3.5 <<http://plants.usda.gov>>. National Plant Data Center. Baton Rouge, LA 70874-4490

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