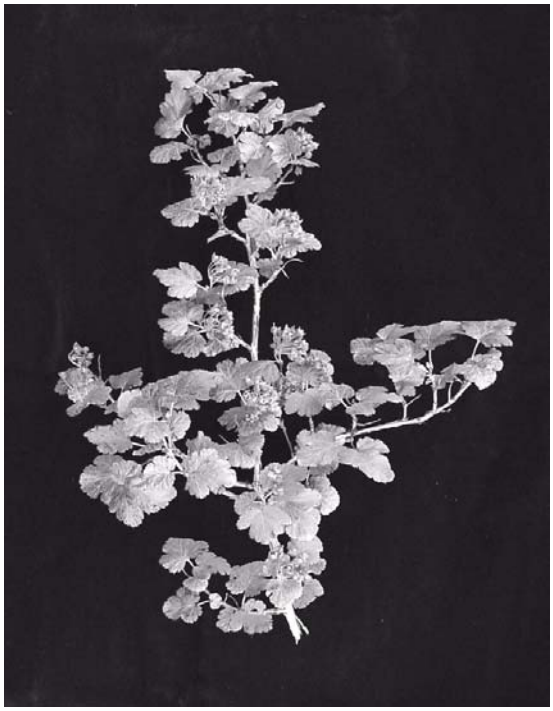
***Physocarpus malvaceus* (Greene) Kuntze** mallow ninebark
ROSACEAE

Synonyms: *Spiraea oputifolia* var. *pauciflora* Torr. & Gray
Neillia malvaceae Greene
Opulaster malvaceus Kuntze
Physocarpus pauciflorus Piper



General Description.—Mallow ninebark, also known as ninebark, mallow-leaved ninebark, mountain ninebark, few-flowered ninebark, and shallow ninebark, is a multistemmed, deciduous shrub 1 to 2 m (rarely 3 m) in height. The stems and branches are slender and covered with a brown bark that exfoliates in papery strips on older branches. The 3- to 5-cm, alternate leaves are round to ovate, three to five lobed, and doubly serrate or crenate. The petioles are 1 to 2 cm long. Inflorescences are terminal, corymbose with five to 30 flowers. The hypanthium of the flowers is stellate-pubescent; twigs, petioles, and leaf blades vary from pubescent to glabrous. The flowers have five sepals and five white, rounded petals 3.5 to 6.5 mm long. Each produces two inflated, brown follicles united for two-thirds their length. Each fruit may contain one to several shiny, pair-shaped, straw-colored seeds (Abrams 1950, Welsh and others 1987).

Range.—Mallow ninebark is native to British Columbia, Alberta, Washington, Oregon, Idaho, Montana, Wyoming, Colorado, Utah, and Nevada (Abrams 1950, Natural Resources Conservation Service 2003). It is not known to have naturalized outside its native range.

Ecology.—Mallow ninebark grows on a wide variety of soils derived from igneous, metamorphic, and calcareous and noncalcareous sedimentary rocks. Textures range from sandy loams to silty clay loams and surface pH ranges from 5.5 to 7.1. In Idaho and Montana, the average duff layer thickness was 6.5 cm with an effective rooting depth of 38 cm. In northern areas, mallow ninebark is found mainly in areas with no exposed rock on mountain slopes, ridges, and streambanks (Habeck 2003); in Utah, it often grows in skeletal soils and rubble in steep canyons and mountainsides. It occurs at elevations of 1,600 to 3,300 m at the southern end of its Utah range (Welsh and others 1987) and at somewhat lower elevations farther north. The species is associated with *Abies lasiocarpa* (Hook.) Nutt., *Abies grandis* (Dougl. ex D. Don) Lindl., and *Picea engelmannii* Perry ex Engelm. in cool/moist habitat and with *Pseudotsuga menziesii* (Marbel) Franco and *Pinus ponderosa* P. & C. Lawson in warmer, moist sites (Habeck 2003). While associated with these trees, mallow ninebark usually grows in disturbance-caused openings or diffuse stands. It also grows on nonforested shrubland sites. Some common shrub associates are *Holodiscus discolor* (Pursh) Maxim., *Symphoricarpos albus* (L.) Blake, *Symphoricarpos oreophilis* Gray, *Spirea butilifolia* Pallas, *Amelanchier alnifolia* (Nutt.) Nutt. ex M. Roemer, and *Mahonia repens* (Lindl.) G. Don (Habeck 2003). Mallow ninebark is fire resistant, sprouting after topkill from surviving root crowns or horizontal rhizomes (Palouse Prairie Foundation 2003). Having 36 to 99 percent of its roots buried in mineral soil enables it to escape the heat of surface fires (Habeck 2003). Mallow ninebark stands often owe their existence to logging or fires. The species is an obligate pioneer that increases

and grows rapidly following disturbance, but as competition, particularly overhead shade, increased, it decreases in mean height and gradually disappears (Habeck 2003). The species is generally free of insect and disease problems, although it is occasionally attacked by foliage-eating and seed-eating insects (Youngblood and others 2003).

Reproduction.—Flowering takes place between late May and late July, depending on altitude, and fruits ripen between late August and late September (Habeck 2003). Seed weights are reported (geographic source unspecified) at 165,000 seeds/kg (Youngblood and others 2003). Seeds collected by the author in Utah averaged 158,000 seeds/kg. Viability is usually less than 50 percent (Youngblood and others 2003). The fruits split open at maturity but most of the seeds do not immediately fall. Dispersal is by gravity, wind, and probably by browsing animals. Seeds in the soil seedbank are reported to be 11 percent viable and will germinate when the surface is scarified (Habeck 2003). Ripe fruits can be picked by hand or beaten off shrubs onto a tarp. Fruits may be threshed by rubbing for small quantities or passed through a hammer mill for larger quantities and screened and blown to clean them. They may be stored cool and dry for at least 5 years. Seeds may be sown in the fall, or in the spring after 30 days of prechilling. Seeds should be sown to a depth of 3 mm and mulched with another 6 mm of sawdust (Youngblood and others 2003). Mallow ninebark can easily be vegetatively reproduced with misted softwood cuttings or by planting hardwood cuttings directly in the field (Youngblood and others 2003).

Growth and Management.—Mallow ninebark shrubs in northern Idaho reached their maximum height by the fourth growing season after a fire (Habeck 2003). Although stems are added and lost continuously, shrubs do not grow taller. Individual plants may live for many years if growing conditions permit. Mallow ninebark is sometimes planted for soil stabilization and other conservation objectives. Killing the shrubs to make room for more desirable species is sometimes attempted. Several herbicides can be effective if sprayed early in the season from late foliar development to flowering or in early fall before leaves change color. Sprouts will sometimes appear later and will have to be sprayed again (Habeck 2003).

Benefits.—Mallow ninebark helps protect the soil during secondary succession until the shrub is replaced by taller vegetation. It adds beauty to forest openings and shrublands when its leaves turn russet-red in the fall (Clark 1976). The species provides cover for both large and small animals. It is one of the principal nesting sites of the dusky flycatcher (*Empidonax oberholseri*) (Sedgwick 1993). The shrub is not browsed by cattle and is utilized only to a limited extent by deer, bighorn sheep, and domestic sheep. The upper third of the annual growth of plants from a burned area contained 1.3 percent N, 0.3 percent P, and 1.2 percent Ca. Plants in an unburned site contained even lower levels (Habeck 2003). Early summer sheep grazing increases the nutritional quality of mallow ninebark for fall and winter browse (Alpe and others 1999).

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