

Round-Leaved Filaree (*Erodium macrophyllum*)

Status

Federal: None

State: Meets requirements as a rare, threatened, or endangered species under CEQA

CNPS: List 2

Population Trend

Global: Declining

State: Declining

Within Inventory Area: Unknown

Data Characterization

Estimates of the number of populations of round-leaved filaree in California range from 75 (California Natural Diversity Database 2004) to approximately 100 (Gillespie 2003). The records range from 1846 to 2003. Seventeen occurrences have been documented in the previous 10 years. All but two occurrences are believed to be extant (California Natural Diversity Database 2004), although many of the populations are known from historic collections and have not been documented recently. Seven occurrences are located within the inventory area. These are general occurrences, mostly historic, that cannot be located precisely.

Very little information is available for round-leaved filaree; the literature on the species pertains to its taxonomy. Gillespie (2003) completed a doctoral dissertation on the ecology of round-leaved filaree and the effects of different methods to restore the species. The main sources of general information on this species are *The Jepson Manual* (Hickman 1993), the California Native Plant Society (2001), and the California Natural Diversity Database (CNDDDB) (2004). Specific observations on habitat and plant associates, threats, and other factors appear in the CNDDDB occurrence records and in Gillespie (2003).

Range

Round-leaved filaree ranges from southern Oregon through California into northern Mexico (Gillespie 2003). In California, it is known from scattered occurrences in the Great Valley, southern North Coast Ranges, San Francisco Bay Area, South Coast Ranges, Channel Islands, Transverse Ranges, and Peninsular Ranges (Taylor 1993; California Natural Diversity Database 2004). Most of the populations occur in California: one historic collection is recorded from southern Oregon, and three historic collections are recorded from Baja California (Gillespie 2003). Most of the recently documented occurrences are in the interior foothills of the South Coast Ranges (Gillespie 2003).

Occurrences within the ECCC HCP/NCCP Inventory Area

Seven occurrences of round-leaved filaree are listed within the inventory area, in the Mount Diablo foothills south of Antioch. Six of the occurrences are only known from collections made in or before 1941; at least one of these may be extirpated (California Natural Diversity Database 2004). None of the occurrences are known to be on public lands.

Biology

Physical Description

Round-leaved filaree is an annual herb that generally grows prostrate. The plants bloom between March and May (California Native Plant Society 2001), producing small (1 cm) white flowers. The flowers are self-pollinating (Gillespie 2003). Seeds are produced and dispersed following the blooming period.

Habitat

Round-leaved filaree occurs in grasslands on friable clay soils (California Native Plant Society 2001; California Natural Diversity Database 2004), although it may historically have been common on other soil types (Gillespie 2003). It has been found in nonnative grassland on clay soils with relatively low cover of annual grasses (Jones & Stokes 2002, 2003). It most often occurs in foothill locations at elevations between 200 and 2,000 feet, but is has been collected from locations as low as 30 feet and as high as 4,000 feet.

Species Associated with Round-leaved Filaree

<i>Achyrrachaena mollis</i>	blow-wives
<i>Allium munzii</i>	Munz' onion
<i>Apiastrum angustifolium</i>	wild celery
<i>Convolvulus simulans</i>	small-flowered morning-glory
<i>Deinandra halliana</i>	Hall's tarplant
<i>Hirschfeldia incana</i>	Mediterranean mustard
<i>Lupinus succulentus</i>	arroyo lupine
<i>Madia radiata</i>	showy madia

Threats

Population trends are not known for any of the occurrences (California Natural Diversity Database 2004). However, round-leaved filaree is presumed to be declining in southern California due to loss of its friable clay microhabitat (Reiser 1994). Because information about the species is so limited, no specific threats have been documented, although urbanization and competition from

nonnative species are cited as threats (California Native Plant Society 2001; Gillespie and Allen 2004). Other potential threats include recreation activities, grazing, illegal dumping, and erosion (California Natural Diversity Database 2004; Gillespie 2003). Because most populations are small (<1,000 plants), the populations are vulnerable to natural events (e.g., drought) as well as human disturbances, both of which reduce the number of seeds produced.

Special Biological Considerations

The cause for rarity of round-leaved filaree is uncertain. The cause may be abiotic, such as the loss of habitat by urbanization, or biotic, such as competition from nonnative grasses (Gillespie 2003; Gillespie and Allen 2004). Populations need to be located, secured, and protected, and research is needed to determine the cause of the species' rarity, to identify actual threats, and to determine management measures, if needed. The friable clay soils on which the species occurs are uncommon and may occur as small inclusions within larger soil map units, making it difficult to locate areas for potential preservation or mitigation.

Observations of round-leaved filaree on fire trails suggest that disturbance may benefit the populations (Jones & Stokes 2002, 2003). The nature of this benefit is not clear, but could range from uncovering buried, dormant seeds to providing a micro-site free from competing nonnative grasses. Gillespie (2003) studied the effects of hand removal of exotic species and controlled burns on round-leaved filaree. He found that hand removal of exotic species enhanced the successful establishment of round-leaved filaree in grassland test plots. He found that controlled burns have mixed effects, reducing establishment but enhancing seed production (Gillespie and Allen 2004).

Species Distribution Model

Model Description

Model Assumptions

1. Primary habitat: Nonnative grassland between 200 and 2,000 feet on clay or clay loam soils (Soil Conservation Service 1977).
2. Secondary habitat: All other nonnative grassland below 4,000 feet on clay or clay loam soils (Soil Conservation Service 1977).

Model Rationale

The CNDDDB records indicate that round-leaved filaree generally occurs in grasslands on friable clay soils (California Native Plant Society 2001; California Natural Diversity Database 2004). It has been found in nonnative grassland on clay soils with relatively low cover of annual grasses (Jones & Stokes 2002, 2003). It most often occurs in foothill locations at elevations between 200 and 2,000 feet, but it has been collected from locations as low as 30 feet and as high as 4,000 feet (California Natural Diversity Database 2004). For the purpose of the model, clay or clay loam soils were defined as those soils described in the

Contra Costa soil surveys as having a clay or clay loam component in the upper 16 inches of the soil profile (Welch 1977).

Literature Cited

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