

## MACFARLANE'S FOUR- O'CLOCK

*Mirabilis macfarlanei* Constance  
& Rollins

Plant Symbol = MIMA2

Contributed by: USDA NRCS Idaho Plant Materials Program



Figure 1. Macfarlane's four-o'clock (*Mirabilis macfarlanei*).

### Alternate Names

This species has no known alternate names.

### Status

MacFarlane's four-o'clock was listed endangered in 1979 when only 3 populations were known totaling approximately 25 plants (USDI Fish and Wildlife Service, 1979). Since listing, additional populations have been found as a result of increased monitoring, and in 1996, the species was downlisted to threatened (USDI Fish and Wildlife Service, 1996). The species is considered threatened in Idaho (State of Idaho, 2009) and endangered in Oregon (Oregon Department of Agriculture, 2009). Natureserve gives the species a global status of G2 (imperiled), and state rankings of S2 (imperiled) in Idaho and S1 (critically imperiled) in Oregon (Natureserve, 2009). 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:* Four-o'clock family (Nyctaginaceae). MacFarlane's four-o'clock is a perennial herb that forms hemispheric clumps from 23 to 32 inches across

(Spellenberg, 2003). The inflorescence is a cluster of 3 to 7 magenta flowers, each approximately 1 inch in diameter. Flowering typically occurs from May to early June. Leaves are opposite, green above and waxy below. Lower leaves are widely ovate to deltoid with a rounded to heart-shaped base. The plants arise from a thickened tuber (1.5 to 3 inches thick) which sends out shoots to produce daughter clones.

### Distribution:

There are currently eleven known populations in Idaho County, Idaho and Wallowa County, Oregon. The total geographic range covers approximately 29 by 18 miles (Kaye, 1992). For current distribution, consult the Plant Profile page for this species on the PLANTS Web site.

### Habitat:

The species occurs in grassland habitats in steep river canyons from 1,000 to 3,000 feet in elevation. Populations occur primarily in bunchgrass communities dominated by bluebunch wheatgrass, Snake River wheatgrass, Sandberg bluegrass, sand dropseed and Fendler threeawn. Other species growing in association include cheatgrass, smooth sumac and rabbitbrush (USDI Fish and Wildlife Service, 2000).

### Adaptation

MacFarlane's four-o'clock grows in regions with warm and dry conditions where precipitation occurs mostly as rain during winter and spring. Sites are dry and generally open, although scattered shrubs may be present. Average annual precipitation for the region is approximately 12 inches. The soils vary from sandy to talus substrate (USDI Fish and Wildlife Service, 1996).

### Establishment

Plants are established via seed dispersal as well as asexually from a thick woody tuber. Seed is dispersed in June through July, falling near the parent plant and may be spread further by water, gravity or animals. Germination occurs in the spring under proper environmental conditions. Asexual reproduction however appears to be the primary mechanism for spread of the plants.

### Management

This species is currently being managed through the reduction of livestock grazing and the restriction of recreational use (USDI Fish and Wildlife Service, 2009). Due to the steep habitats on which the species occurs, weed control and wildfire suppression is difficult. Site specific monitoring and management plans are being developed by BLM and Forest Service. Additional

studies are necessary to assess life history and ecological needs of the species.

### **Pests and Potential Problems**

Large disturbances such as fire, herbicide drift and landslides have the potential to extirpate small populations. Poorly managed grazing has also been indicated as a threat to MacFarlane's four-o'clock habitat (USDI Fish and Wildlife Service, 2009).

Lepidopterans and spittlebugs have been observed damaging plants (Baker, 1983; Kay et al., 1990). Feeding nymphs can cause floral abortion and shoot death. These threats do not appear however, to significantly affect existing populations (USDI Fish and Wildlife Service, 2009).

The chief threat to MacFarlane's four-o'clock is the degradation of habitat caused by invasion of exotic plant species. Cheatgrass, yellow starthistle, toadflax and spotted knapweed are the major invasive species noted at or near established populations.

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