A Success Story
Tom McCall Preserve, Northeast Oregon

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The Setting

The Tom McCall Preserve sits high on the edge of the Columbia River Gorge, in north central Oregon. The Gorge lies in the transition zone between the moist, heavily forested west side of the Cascade Mountains and the drier bunchgrass prairie of the Columbia Plateau. Situated along this interface, the preserve supports many different vegetation types and wildlife habitats on its 213 acres. Biodiversity is high: more than 300 plant species live on its wooded hillsides and open grassland slopes, and several are endemic only to the Gorge. Additionally, a large network of mounds and swales, vernal pools, and rocky basalt cliffs created by past volcanic activity, are home to rare plant species such as: Thompson's broadleaf lupine (*Lupinus latifolius* var. *thompsonianus*), Columbia desert parsley (*Lomatium columbianum*), Thompson's waterleaf (*Hydrophyllum capitatum* var*. thompsonii*), and Hood River milkvetch (*Astragalus hoodianus*).

The Invader – Diffuse knapweed (*Centauria diffusa* Lam.)

Diffuse knapweed is a highly competitive and aggressive non-native broad-leaved herb that forms dense colonies in pastures, rangelands, croplands, and along riverbanks. It is a native of Asia minor, the Balkans, and the southern portion of the former Soviet Union, especially the Ukraine and Crimea (Zimmerman 1997). Watson (1972 *In*: Zimmerman 1997) reports that diffuse knapweed is common in Romania, Yugoslavia, northern Italy, the eastern shore of the Mediterranean, Turkey, Greece, Bulgaria, and Syria. It was first collected in the U.S. in a Washington state alfalfa field in 1907, and is thought to have been introduced through impure Turkestan alfalfa or possibly hybrid alfalfa seed from Germany. It is now widespread throughout 19 states, including all of the contiguous states west of the Rocky Mountains. Idaho, Montana, Oregon, and Washington report the worst infestations.

Diffuse knapweed spreads rapidly along rights-of-way and farm roads, and can even invade undisturbed grassland, shrubland, and riparian communities. Once established, diffuse knapweed reduces the abundance of native vegetation by its intense competition for water and nutrients. Furthermore, diffuse knapweed contains the chemical cnicin, which suppresses the growth of native species (Watson & Renney 1974). This weed is unpalatable to livestock, and its spines may cause injury to the mouth and digestive tract of grazing animals. By 1988, large portions of the Tom McCall Preserve were infested by this weed.

Native biodiversity, and especially the survival of several populations of rare plant species, were directly threatened by the spread of diffuse knapweed.

A Success Story

The Tom McCall Preserve's diffuse knapweed infestation was large but it was located in an area easily accessible to a large pool of volunteers from the Portland metropolitan area. From 1989 to 1994, volunteer work parties engaged in intensive weed control; rosettes of diffuse knapweed were dug in the spring, and volunteers pulled mature and immature plants in early summer, before the seeds formed. Any remaining plants were pulled and bagged in the last pull of the season in mid to late summer. By pulling this weed three times a year, the diffuse knapweed populations were reduced by 97-99% by 1994.

Efforts to control diffuse knapweed and other weeds on the preserve continue today, but require much less effort now. While volunteers logged approximately 360 person-hours per year in 1989, only a few hours a year are now required to patrol the sites and pull the few dozen plants that still sprout from old seed buried in the ground. In 2000, a total of just 24 plants were discovered and pulled out. Berta Youtie, an ecologist for The Nature Conservancy in northeast Oregon, concludes that if enough volunteers are available, pulling is an effective way to control small populations of diffuse knapweed. She notes that "although hand pulling is initially more labor intensive than other control measures, it is extremely specific. It can be the best route when controlling scattered knapweed plants growing among native plants."

While diffuse knapweed has been successfully removed on the Tom McCall Preserve, other weeds and stresses continue to threaten this natural landscape. But, with this invader gone, the preserve is one step closer to maintaining its high level of native biodiversity.

More Information

For more information, contact John M. Randall, the director of TNC's Wildland Invasive Species Program at 530-754-8890 or at jarandall@ucdavis.edu. A review article with more detailed information about diffuse knapweed, including a description of its diagnostic characteristics, range, ecology, and methods for its control, is available on the TNC Wildland Invasive Species Program website (http://tncweeds.ucdavis.edu/esadocs/centdiff.html).

References

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