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## ***Controlling exotic invasive plant species after fuel reduction with herbicides and native seeding***

### **Management Implications**

- Project results will allow managers to assess the effectiveness of herbicide use and native seeding to control exotic weed species.
- This research will supply statistically valid, practical information to help develop invasive weed control programs in association with fire and fuel reduction treatments.
- Results can also be applied to develop weed control programs in association with post-wildland fire management.

To reduce the risk of catastrophic fire at the wildland urban interface, land managers are now initiating fuel reduction projects at many sites. While effective at diminishing fuel reservoirs, these projects can cause disruption to forests. Thinning opens the canopy, exposing formerly shady patches of forest floor to bright sunlight.

Removing felled trees exposes forest soils to colonization by other plants. For this reason, plant restoration programs are often used to help prevent exotic plants from invading native forests.

Previous efforts at native plant restoration have typically included plants associated with later habitat stages of succession such as bunchgrasses and shrubs. These species are relatively slow-growing and may not be adapted to growing in recently disturbed soils. As a result, they may not be the best species to include in initial habitat restoration.

USDA Forest Service research ecologist Becky Kerns and Oregon State University Forest Resources and Forest Science student Gabrielle Snider are investigating whether native plants that prefer disturbed soils will perform better at controlling exotic invasive plants than later successional species. They plan to apply seed mixes containing these species in a forest scheduled for fuel reduction treatments near Liberty, Washington.

In previous eras, native opportunistic forbs and grasses would have been able to sprout in these newly opened areas from seed banks lying dormant in the soil. But in modern forests, the long absence of fire and buildup of detritus has likely reduced or eliminated this native seed reservoir. Disturbed soils are now vulnerable to takeover by exotic invasive weeds growing along nearby roads and in urban areas.

Kerns and Snider began by documenting plant species distributions in and around the site prior to treatment. They found that the forest harbors primarily native species, but roads and other disturbed areas have been extensively colonized by diffuse and meadow knapweeds as well as other invasive exotic plants.

The researchers will continue to track plant species changes during and after herbicide treatments, designed to prevent exotic invasive species from growing until native species can take root; tree thinning; and reseeded with native opportunistic plants. Kerns and Snider will then follow the relative success of seeded species used in restoration to determine which plant mixes perform best. The researchers are working with the Native Seed Network ([www.nativeseednetwork.org](http://www.nativeseednetwork.org)) to determine the seed mix makeup. Species being considered so far include yarrow, heart-leaved arnica, fireweed, and native grasses. Because they are fast-growing, these species are more likely to be able to occupy forest soils before the knapweed and other invasive species can take root. Yarrow, for example, can spread vegetatively via rhizomes as well as by seed. Ultimately, establishing populations of native plants and preventing the introduction of exotics is likely to provide better habitat for native fauna and flora.

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