



USDA Forest Service
PNW Research Station



Research on Nonnative Invasive Plants

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Issue

Invasive plants pose increasing ecological and economic risks in Western States, accounting for tens of millions of dollars worth of damage annually. Invasive plants can displace native species, degrade wildlife habitat, eliminate forage for wildlife and livestock, affect fire frequency, alter soil properties, decrease biodiversity, and threaten rare species through competition or hybridization. Invasive plants spread across landscapes, unimpeded by ownership boundaries.

Response

PNW Research Station is using an integrated, multidisciplinary strategy to address invasive species and their ecological impacts. The approach is *multiscale*.

- At the *species level*, we are developing basic knowledge of plant ecology and reproductive biology to better understand distributions, eradication possibilities, and interactions among native and nonnative plants.
- At the *landscape level*, we are studying how invasive plants respond to disturbance and management, especially to wildfire, prescribed fire, and fuel treatments. We are developing methods to assess the distribution of invasive plants and severity of related effects.
- At the *molecular level*, we are studying genetic markers to clarify relations among species, identify which native populations would be most resilient to invasives, and to understand the risks of nonnative invasive plants hybridizing with native species, a suspected factor in the success of invasives.
- We are building risk assessments to help managers understand (1) risk factors that make ecosystems vulnerable to invasion, (2) interactions among landscape disturbances and management activities, and (3) factors for prioritizing treatment of existing invasive plants.
- We are developing techniques that managers can use to minimize invasive plant risks and techniques for elimination, control, or mitigation of invasive plants.
- We are developing guidelines and protocols for rehabilitation and restoration projects, including the restoration of burned areas, to prevent invasions and build resilient native plant communities. We are developing protocols for the collection and transfer of native plant seed and vegetative propagules, for reintroducing native species.

Products

Research information is being communicated through workshops, forums, symposia, publications, and educational products. Products include:

- Fact sheets for nongovernment organizations and other agencies.
- Field guide on sulfur cinquefoil, an emerging serious problem, and native cinquefoils.
- Development of a landscape-scale model for managers to predict invasive plant risks.
- Remote sensing techniques to detect invasive plants.
- Data on the current distribution of invasive plants.
- PowerPoint presentation used by federal and state agency staff throughout Oregon, Washington, and Idaho, to educate cattlemen's associations, university classes, and residents of weed management areas.

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