

APPENDIX H: NOXIOUS AND INVASIVE PLANTS

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Non-indigenous species, that is, species that exist outside of their native ranges, are one of the biggest challenges land managers face. Various terms, 'alien', 'invasive', 'exotic', 'weedy', or 'noxious', these species can harm agriculture and damage native species and habitats.

The term 'noxious weed' is often used in a narrow legal sense to refer to plants defined and listed by a government agency, usually because they are a threat to agriculture. Not all 'noxious weeds' are non-indigenous (for example, bracken fern, a native plant with potential erosion control value, is listed as noxious by the state of Minnesota). Conversely, some non-indigenous plants that threaten natural values do not appear on government lists.

Congress has broadly defined noxious weeds in the [Federal Noxious Weed Act](#). In this context, noxious weed "means any living stage (including but not limited to, seeds and reproductive parts) of any parasitic or other plant of a kind, or subdivision of a kind, which is of foreign origin, is new to or not widely prevalent in the United States, and can directly or indirectly injure crops, other useful plants, livestock, or poultry or other interests of agriculture, including irrigation, or navigation or the fish and wildlife resources of the United States or the public health."

PAST CONDITION

Using the standard benchmark of Euro-American settlement, noxious and invasive species did not occur in the analysis area in the past. Aboriginal cultures probably moved species from place to place, but given the differences in transportation technology, the magnitude of this movement was much smaller than it is today. Social structures did not exist to define any plant as noxious, and human vectoring was not aided by European culture and technology.

PRESENT CONDITION

Noxious and invasive species are now ubiquitous. They have transformed the landscape of the analysis area over the course of the last 150 years. Gorse and European beachgrass are the dominant vegetation of much of the Oregon Dunes, Scotch broom and blackberries infest substantial portion of the landscape up to moderate elevations in the mountains. Few meadows are free of grasses brought from Europe and Asia, which partially or completely displace the native grasses. Species such as spotted knapweed, (established east of the Cascades and in local areas within the analysis area), and yellow starthistle (which dominates 10 million acres in California) are entering the area along highway corridors,

vectored by vehicles. Every disturbance leaves land vulnerable to the spread of weeds, whether they are common and unavoidable species, or species that have not yet become established in the analysis area.

Most weeds require some level of disturbance to establish. Most have adaptations allowing long-distance dispersal, but many infestations are the result of transportation by vehicles. The spread of spotted knapweed along highway corridors is a case in point. This plant is often found away from highways at dispersed recreation sites where vehicles have parked or stock has been fed contaminated hay.

The Forest Service has an active program to control noxious weeds. The current emphasis is on use of integrated management systems, and the Forest Service has a strong interest in using biological control agents. A recently issued interim directive on noxious weeds includes several notable components. Where possible, forage and browse seed for planting and feed, hay, or straw brought onto Forest Service lands must be certified free of noxious weed seed. The directive further encourages the use of desirable plant species that out-compete noxious weeds and requires where appropriate that equipment brought onto Forest Service lands by contractors or permittees be free of noxious weed seeds. Forest Supervisors are specifically instructed to assess the risks of introducing noxious weeds in projects that disturb plant communities (OTA, 1993).

“Pulling Together”, the national interagency weed [strategy](#), was developed to present a unified national response to the pervasive threat of non-indigenous species.

The Oregon Department of Agriculture maintains lists of noxious weeds, and prohibits trafficking in some species. The WNF maintains lists of new and potential invaders, with high priority for treatment given to those species.

In addition to ongoing prevention efforts, the WNF is presently managing (treating) weeds on 205 sites. An integrated management approach is taken, with all possible control measures allowed. Herbicide use is limited to Rodeo and Garlon 3A. Most of the sites are on or near roads. Sites are only treated when they contain species classed as ‘New Invaders’. Most are spotted knapweed sites (USDA 1999). This approach recognizes that many exotic species (including those on the “Established species” list) will persist in areas receiving persistent disturbance such as roadsides, and concentrates resources on less ubiquitous species.

Weeds analyzed in USDA 1999.

Potential Invaders	New invaders	Established species
Leafy spurge	Spotted knapweed	Bull thistle
Purple loosestrife	Diffuse knapweed	Canada thistle
Yellow starthistle	Yellow toadflax	Scotch broom
Distaff thistle	Dalmatian toadflax	St. Johns-wort
Squarrose knapweed	Giant knotweed	Tansy ragwort
	Meadow knapweed	
	Climbing nightshade	
	Field bindweed	
	Evergreen blackberry*	
	Himalayan blackberry*	
	False Brome	
	Reed canary grass	
	Sweetclover	
	Houndstongue	

*Classed as new invaders if sites are isolated and contain 10 or fewer plants.

The Eugene BLM district has a similar approach, but they currently limit treatments to pulling and mowing. Since most of the land managed by this unit is lower elevation, Scotch broom and blackberries are a much greater problem. A large infestation of meadow knapweed in the Horton area originated when a large tract of private land was seeded with contaminated seeds. The species is dispersing along road corridors, and constant treatment is required.

DESIRED FUTURE CONDITION

A ballpark range for total direct non-indigenous weed costs in the USA is \$3.6 billion to \$5.4 billion annually (OTA 1994), but this figure mainly addresses treatment of non-indigenous plants in croplands. It is difficult to assign monetary value to the loss of native species and degradation of native communities that occurs when relatively natural habitats are invaded by non-indigenous plants.

Approximately 5,000 species of alien plants have escaped into natural ecosystems of the United States (where about 17,000 spp. are native)...(Morse *et al.* in [Pimental 1999](#)). Over 40% of our Threatened and Endangered species are endangered at least in part because of introduced plant or animal species, (REF). Weeds damage wildlands in other ways as well. Invasive plants may change the proportions of native species in their natural habitat. They may change the natural functioning of wetlands, such as when *Lythrum salicaria* (purple loosestrife) converts diverse wetlands into weed monocultures. They degrade wildlife habitat, as when native browse species are replaced with less palatable non-

indigenous species. Weeds may also change fire regimes in ways that prevent restoration: annual grasslands that burn frequently support fewer native grasses and shrubs in much of west USA.

Given the extreme damage to ecosystems and economic activities caused by weeds, it is critical to reduce their extent and prevent their spread wherever possible. To this end, project design and implementation must always include features to prevent and treat weed infestations, and weed education should be available to all workers involved in activities that may encourage such infestation.

Wildfire and activities associated with fire fighting and prescription burning create opportunities for weeds to establish by removing existing vegetation or disturbing soil, and may vector weed propagules (seeds, rhizomes, or other viable plant material), bringing them into previously uninfested areas. In a few special cases, prescribed fire may discourage exotic species. For example, spring burns can prevent seed set in annual (and even some perennial) grasses, favoring native species.

All activities must be designed to prevent the spread and establishment of noxious and invasive plants. Available techniques include washing vehicles to prevent vectoring of weed propagules into project areas, treating sites in project areas to prevent their spread, and treating sites on travel routes associated with projects. Weed establishment may be discouraged in disturbed areas by seeding with local native seeds, although this method is experimental. Ephemeral species (such as winter wheat) may be more valuable for competitive exclusion.

In addition to prevention, aggressive and effective treatment should be the norm for all new infestations associated with any activity, including prescribed fire and wildland firefighting.

It is critical to note here that non-forested plant communities are most at risk for weed invasion, and for permanent conversion to weed sites. Forest succession may eventually lead to conditions unfavorable for weed persistence, but this may never occur in meadows, openings, and woodlands. Weed infestations in these areas may lead to total loss of the ecological functions associated with these uncommon communities.

Highly degraded non-forested communities thus represent opportunities to initiate experimental burning projects to reduce weeds. For example, in grassland and oak savannah, studies in the California State Parks system have found that yellow star thistle can be reduced by multiple, closely timed burns, the first to destroy the standing crop, and follow-up burns to reduce the seed bank to manageable levels. In this environment, regular burning reduces fire hazard caused by the noxious weed. Repeated spring burns may also reduce the annual exotic grass component in infested native prairies and meadows.

REFERENCES

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- USDA Forest Service. 1999. [Willamette National Forest integrated weed management environmental assessment](#).
- Westbrooks, R. 1998. [Invasive plants, changing the landscape of America: Fact book](#). Federal Interagency Committee for the Management of Noxious and Exotic Weeds (FICMNEW), Washington, D.C. 109 pp.

SCIENTIFIC AND COMMON NAMES OF SPECIES MENTIONED IN
TEXT

<i>Ammophila arenaria</i>	European beachgrass
<i>Brachypodium sylvaticum</i>	false brome
<i>Carthamnus lanatus</i>	distaff thistle
<i>Centaurea diffusa</i>	diffuse knapweed
<i>Centaurea maculosa</i>	Spotted knapweed
<i>Centaurea pratensis</i>	meadow knapweed
<i>Centaurea solstitialis</i>	yellow starthistle
<i>Centaurea virgata</i> spp. <i>squarrosa</i>	squarrose knapweed
<i>Cirsium arvense</i>	Canada thistle
<i>Cirsium vulgare</i>	bull thistle
<i>Convolvulus arvensis</i>	field bindweed
<i>Cynoglossum officinale</i>	Houndstongue
<i>Cytisus scoparius</i>	Scotch broom
<i>Euphorbia esula</i>	leafy spurge
<i>Hypericum perforatum</i>	St. John's-wort
<i>Linaria dalmatica</i>	Dalmatian toadflax
<i>Linaria vulgaris</i>	yellow toadflax
<i>Lythrum salicaria</i>	purple loosestrife
<i>Melilotus</i> spp.	sweetclover
<i>Phalaris arundinacea</i>	reed canarygrass
<i>Polygonum sachalinense</i> and <i>P. cuspidatum</i>	giant knotweed
<i>Rubus laciniatus</i>	evergreen blackberry
<i>Rubus procerus</i>	Himalayan blackberry
<i>Senecio jacobaea</i>	tansy ragwort
<i>Solanum dulcamara</i>	climbing nightshade
<i>Ulex europaeus</i>	gorse