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Managing Invasive Noxious Range Weeds in the Great Basin

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Invasive noxious weed encroachment is a primary threat to the biological diversity of Nevada's rangeland resource. Invasive plants also cause millions of dollars of damage annually in the West to agriculture, recreational, and tourism industries. A range landscape should consist of a dynamic mosaic of plant species. Each plant species occupies a specific ecological habitat determined by factors such as soil type, moisture, shading, slope, aspect, or other site factors. This combination of plants in the landscape provides the habitat necessary for the survival of wildlife and domestic livestock animal species that we find necessary for of our quality of life.

All plant and animal species coexist with other organisms that can stress (or weaken) them. Herbivory by animals or insects, loss of habitat, and diseases are examples of biological stresses that limit a particular plant species ability to successfully compete with other plants.

Invasive noxious weed species originated on another continent. They readily spread across North America environments similar to their native habitat. When introduced on this continent, few of the external stresses that kept them in check were transferred with them. In time, other stresses may develop to keep them in check, but that process may take hundreds or thousands of years. In the meantime, these adapted plants outcompete native plant species, develop moncultures where only they grow, and change the habitat of native plants and animals.

Endangered plant species (and the animals that specifically depend on them) by their very nature, are especially at risk. In contrast, invasive species grow and reproduce in the face of numerous stress organisms that are absent in their new home. In a relatively short time, an invasive species can dominate specific environments of the landscape where they may comprise 70%-100% of the plant community. With that domination, all other organisms, including endangered species, that depended upon the previous community diversity may be displaced or eliminated.

Plant species that are, or have potential to, dominate range or ecological landscapes in the Great Basin include:

musk thistle (Carduus nutans)

spottedknapweed (Centaurea maculosa)

Russian knapweed (Centaurea repens)

diffuse knapweed (Centaurea diffusa)

yellow starthistle (Centaurea solstitalis)

leafy spurge (Euphorbia esula)

squarrose knapweed (Centaurea virgata ssp squarrosa)

rush skeletonweed (Chondrilla juncea)

sulfur cinquefoil (Potentilla recta)

common crupina (Crupina vulgaris)

Scotch thistle (Onopordum acanthium)

houndstongue (Cynoglossum officinale)

hoary cress / whitetop (Cardaria ssp.)

perennial pepperweed / Tall Whitetop (Lepidium latifolium)

St. Johnswort / goatweed (Hypericum perforatum)

purple lythrum / Purple loosestrife (Lythrum salicaria)

medusahead (Taeniatherum caputmedusae)

dalmation toadflax (Linaria dalmatica)

yellow toadflax (Linaria vulgaris)

saltcedar / tamarisk (Tamarix ramosissima)

downy brome / cheatgrass (Bromus tectorum)

dyer's woad (Isatis tinctoria)

Before effective management can occur, invasive weed infestation levels must be determined. Extensive infestations of a species require a different approach compared to species that has not been currently found in the Great Basin or is only present in very limited areas.

Partnerships must to be established and strengthened between land owners, land managers, conservation organizations, agricultural and sportsman groups, educators, governing bodies, and any others concerned about the ecological diversity of the Great Basin. Weed management should be, by necessity, a wide-area collaborative effort. Without group cooperation, any effort is destined to failure. By working collaboratively, invasive weeds can be excluded or controlled before they dominate a major portion of the landscape. Like many natural resource problems, the solutions are more social than biological.

Prevention of new infestations, or preventing spread of seed to new sites, should be a major component of any program to manage invasive plants. Species which are not currently growing in the Great Basin should not be allowed to establish. The establishment of a quarantine to minimize importation by cleaning vehicles and equipment being moved from infested areas should be a component to stop or greatly reduce initial establishment. Seeding disturbed areas to strongly competitive vegetation where infestations are likely to start will help prevent weed invasion.

New infestations should be eradicated immediately as soon as they are found. This greatly reduces financial and environmental impacts. Early detection of small infestations greatly contributes to probability that eradication is possible. Some species take only a few years to increase from a few plants to an uncontrollable monoculture on hundreds to thousands of acres. Each site should also be mapped immediately so the location is well documented for follow-up inspections of management efforts. Herbicides, hand pulling, and cultivation are frequently tools used for small infestations.

Once an invasive weed dominates substantial acreage other management schemes must be employed. Hand control is generally not practical. Larger scale cultural controls, herbicide applications, and containment measures should be implemented. Preventing spread of the weed to uninfested acres becomes critically important. If not contained, newly infested acres will occur more frequently.

At the point that infestations dominate entire landscapes, the only long-term, feasible tool is biological control. Developing biological controls consist of selecting appropriate target weeds, finding and screening effective natural control agents that won't themselves become a problem, and then establishing the control agent. This program may take several years to complete. After that, weed species suppression may take years or decades to be effective. Also, the introduced control may also not be able to adapt to some areas where the invasive plant species has become well established. Biological control agents should not be considered as the primary management tool used unless the infestation cannot be managed by any of the other tools available.

All land users need to understand the threat of invasive plant species to the environment, other species of plants and animals, agriculture, recreation, and ultimately the economy and their quality of life. They must understand how human activities contribute to the problem. Even individuals who rarely venture outside city limits have a part in either the spread or prevention of invasive noxious weeds in the Great Basin.

Several simple things each of us may do to help slow the spread of invasive weeds include:

- Learn to identify the common invasive plants.
- Avoid taking vehicles through areas infested with invasive weeds.
- Clean off vehicles used in off-road activities before leaving a site where invasive weeds are present.
- Do not pick, or carry away, flowers, seed, and other invasive weed parts for floral arrangements.
- Remove invasive weeds from your property and notify neighbors where invasive weeds exist on or near their property.
- Be vigilant and report suspected invasive weeds to your local Soil and Water Conservation District.
- Consider joining the Nevada Weed Management Association to help your understanding of the problem of invasive weeds in the Great Basin. They can be contacted by writing to: NvWMA, J.A. Young, Secretary/ Treasurer, 920 Valley Road, Reno, Nevada 89512.

Resources:

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- Young, J.A., R.A. Evans, and J. Major. 1972. Alien plants In the Great Basin. J. Range Management. 25:194-201.
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