

NEW DOC



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**NOXIOUS WEED SURVEY AND MANAGEMENT PLAN
WALDEN PRESERVE 2 SUBDIVISION
EL PASO COUNTY, COLORADO**

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October 24, 2014



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**NOXIOUS WEED SURVEY AND MANAGEMENT PLAN
WALDEN PRESERVE 2 SUBDIVISION
EL PASO COUNTY, COLORADO**

OCTOBER 24, 2014

Introduction

Land Resource Associates (Client) is planning to develop 209.2 acres of land east of Monument, Colorado (project area). The current operations, activities, and future use provide opportunities for the introduction and spread of noxious weeds. Noxious weeds are species listed by the State of Colorado as noxious because they aggressively invade or are detrimental to native plant communities and economic crops.

In preparation for development, the Client contracted ERO Resources Corporation (ERO) to survey for noxious weeds to develop an Integrated Weed Management Plan for the project area. Following are the methods used, survey results, and ERO's recommendations.

Location and Site Description

The project area is located in a residential area east of Monument, Colorado at approximately 7,450 feet in elevation. The project area is in Sections 14, 15, 22, and 23, Township 11 South, Range 66 West of the 6th P.M. in El Paso County, Colorado (Figure 1). The UTM coordinates at the approximate center of the project area are NAD 83, Zone 13N; 520922mE, 4326431mN and the latitude/longitude is 39.086747°N/104.758089°W.

The project area consists primarily of undeveloped open space, with a small forested area in the middle and two ponds connected by an upland vegetated swale in the southeastern portion (Figure 2). A stand of ponderosa pine (*Pinus ponderosa*) (Appendix A, Photo 1) is located in the center of the project area and in the southeastern corner. The two ponds contain fringe wetlands, with Kentucky bluegrass (*Poa pratensis*) located in the uplands.

Methods

On September 23, 2014, two biologists with ERO surveyed the project area for noxious weeds (2014 survey). ERO surveyed for all species listed as noxious by the Colorado Department of Agriculture (CDOA) (Appendix B; CDOA 2014). CDOA maintains four lists depending on the severity of potential impacts, and other factors, of these invasive nonnative species.

- List A – Contains noxious weed species designated in the State of Colorado for eradication upon detection.
- List B – Contains well-established weed species in the State of Colorado. These species will require containment and management per El Paso County requirements.
- List C – Contains weed species that are widespread within the State of Colorado. Noxious weed management plans for these species are designed to provide additional educational, research, and biological resources to reduce the harm associated with these species.
- Watch List – This list contains species currently not listed as noxious but that have the potential to threaten agriculture and native ecosystems. The Watch List is intended to serve advisory and educational purposes only.

The 2014 survey consisted of walking the entire project area in transect lines, concentrating on areas most likely to contain noxious weeds, such as disturbed areas and swales. The extents and locations of noxious weed populations were drawn onto aerial photographs (Figure 2).

Noxious Weed Survey Results

Seven weeds listed by the State of Colorado as noxious (CDOA 2014) were found within the project area (Figure 2). Six of these weeds are List B species and one is a List C species. Noxious weeds were found throughout the project area, with higher concentrations found along swales and disturbed areas. The following sections describe the noxious weed species found, their locations within the project area, and density.

Canada Thistle (*Cirsium arvense*), List B

Canada thistles ranging from scattered individuals to large populations were found primarily in the southern half of the project area (Figure 2). Populations were found at

the bottom of swales and along paths. Two large populations located along a walking path had been recently mowed at the time of the 2014 survey (Appendix A, Photo 2).

Diffuse Knapweed (*Centaurea diffusa*), List B

Diffuse knapweed was found in small to medium-sized populations, predominantly in the southern half of the project area (Figure 2). Populations were most often found along disturbed areas such as swales and berms.

Musk Thistle (*Carduus nutans*), List B

Musk thistle (Appendix A, Photo 3) populations ranging from individuals to large, scarce patches were found throughout the project area (Figure 2).

Scotch Thistle (*Onopordum acanthium*), List B

Small scotch thistle (Appendix A, Photo 4) populations were found throughout the project area (Figure 2). Scotch thistle was often found in the same vicinity as musk thistle and yellow toadflax.

Spotted Knapweed (*Centaurea stoebe [maculosa]*), List B

Small spotted knapweed (Appendix A, Photo 5) populations were found throughout the project area (Figure 2). Populations were concentrated in disturbed areas such as swales, berms, and wooded areas.

Yellow Toadflax (*Linaria vulgaris*), List B

Yellow toadflax (Appendix A, Photo 6) was found scattered throughout the project area (Figure 2). Small to medium-sized populations were concentrated in disturbed areas such as swales, berms, and wooded areas.

Common Mullein (*Verbascum thapsus*), List C

Common mullein (Appendix A, Photo 4) individuals were found throughout the project area. Figure 2 shows larger, more concentrated populations.

Noxious Weed Recommendations

The following Best Management Practices (BMPs) and targeted weed-control methods should be implemented to eradicate and prevent the spread of noxious weeds. Preventing the spread of noxious weeds would have the most significant long-term

benefit for minimizing the impacts of these invasive species in the project area.

Prevention is proactive rather than reactive and is the most cost-effective management action. Restoring and maintaining healthy native plant communities also can prevent noxious weed invasion.

BMPs

To prevent the spread of any noxious weeds, the following BMPs should be used throughout the project area:

- Major equipment (track equipment, rubber tire loaders, and backhoes) will be cleaned by high-pressure air or water spray before being delivered to the project area to avoid introducing undesirable plants and noxious weeds.
- Disturbed areas should be reclaimed as soon as practicable after completion of construction and seeded with an appropriate native seed mix (certified as noxious weed-free). In areas where construction is complete but seeding cannot immediately occur due to the time of year, mulch and mulch tackifier should be used for temporary erosion control until seeding can occur.
- Certified weed-free seed, mulch, and borrow material should be used for revegetation. Weed-free straw bales should be used for sediment barriers.
- Locally or regionally available seed and mulch should be used when practicable.
- Fertilizer in seeded areas should be kept to a minimum because fertilizers tend to promote the growth of many noxious weeds and other undesirable species.
- Large bare patches should be reseeded as soon as practicable to prevent the establishment of noxious weeds.
- For all noxious weed populations that are found during and after construction, control methods should be implemented as soon as practicable to prevent establishment because noxious weeds are more difficult to control after they have established.

Targeted Noxious Weed-Control Methods

The following control methods are recommended for each of the noxious weeds found in the project area. These recommendations follow the Integrated Weed Management Plan concepts that assess the best methods to control each species and minimize impacts on the high-quality natural environment within the project area (CDOA 2014).

Important note: Due to a recent court ruling, the Environmental Protection Agency (EPA) is now regulating pesticide residue in waterways as a discharge of a pollutant

regulated under the Clean Water Act. To meet the court order, a general National Pollution Discharge Elimination System (NPDES) permit has been issued that covers the application of pesticides in or near water. In general, only herbicides rated as safe near water must be used, and the Client and the applicator must keep records of the herbicide operations.

Canada Thistle

- **Herbicide** - The most effective method for controlling Canada thistle is through herbicide applications. Milestone (aminopyralid) can be used at a rate of 5 to 7 ounces/acre in the spring to control this weed. To avoid damaging desirable native plants, the herbicide should only be applied with a backpack sprayer. **Caution – Avoid directly spraying in water; avoid spraying on windy days. Always read the label as required by law.**
- **Mowing** - Can be done to slow the growth of the plant and prevent the spread of seeds, but mowing will not eliminate Canada thistle because its extensive root system allows the plants to regrow after mowing.

Diffuse Knapweed and Spotted Knapweed

- **Herbicide** - Both diffuse knapweed and spotted knapweed can be treated using a herbicide such as Milestone (aminopyralid) at a rate of 5 to 7 ounces/acre with a nonionic surfactant in the spring or fall. To avoid damaging desirable native plants, the herbicide should only be applied with a backpack sprayer. **Caution – Avoid directly spraying in water; avoid spraying on windy days. Always read the label as required by law.**

Musk Thistle and Scotch Thistle

- Both of these thistles can be controlled by chopping the plant below the ground surface. The flowers should be placed in a bag to avoid the spread of seeds, and the bag should be disposed of in a safe manner.

Yellow Toadflax

- **Herbicide** - Yellow thistle can be controlled using Telar at a rate of 1 to 3 ounces/acre with a nonionic surfactant in the early summer. To avoid damaging desirable plants, the herbicide should only be applied with a backpack sprayer. **Caution – Avoid directly spraying in water; avoid spraying on windy days. Always read the label as required by law.**

Common Mullein

- Common mullein can be controlled by chopping down the plant. The flowers should be placed in a bag to avoid the spread of seeds, and the bag should be disposed of in a safe manner.

Monitoring and Maintenance

A key to controlling noxious weeds is to monitor the project area for several years to ensure that new populations do not sprout from seeds that may be present or from existing root systems. Any new noxious weed populations found should be eliminated as soon as possible to prevent these aggressive species from establishing and making control difficult.

Conclusion

Seven noxious weeds were found in the project area. The seven noxious weeds should be controlled using Integrated Weed Management Plan methods targeted to the specific species that avoids or minimizes impacts on the relatively intact native ecosystem. One of the most effective methods to prevent the establishment and spread of noxious weeds is through the use of BMPs before, during, and after construction. Other targeted control methods include:

- **Canada Thistle** - Apply Milestone or another herbicide rated as safe near water using a backpack sprayer. Always strictly follow the herbicide label. Mowing can be done to reduce the spread of this species; however, mowing does not eradicate it.
- **Common Mullein** - Chop down and place the plant in a plastic bag. Dispose of the bag in a safe manner.
- **Diffuse Knapweed and Spotted Knapweed** - Apply Milestone or another herbicide rated as safe near water using a backpack sprayer. Always strictly follow the herbicide label.
- **Musk Thistle and Scotch Thistle** - Cut the stem off below the ground surface, bag, and safely dispose the cutoff stalks.
- **Yellow Toadflax** - Apply Telar or other herbicide rated as safe near water. Always strictly follow the herbicide label. Mowing, where practicable, can be done to reduce the spread of this species.

References

Colorado Department of Agriculture (CDOA). 2014. Colorado Noxious Weed List.
Last accessed: July 27, 2014.

Appendix B. Colorado Noxious Weed List

Colorado Noxious Weeds (including Watch List)

List A Species (22)

<i>Common</i>	<i>Scientific</i>
African rue	(<i>Peganum harmala</i>)
Camelthorn	(<i>Alhagi pseudalhagi</i>)
Common crupina	(<i>Crupina vulgaris</i>)
Cypress spurge	(<i>Euphorbia cyparissias</i>)
Dyer's woad	(<i>Isatis tinctoria</i>)
Elongated mustard	(<i>Brassica elongata</i>)
Giant reed	(<i>Arundo donax</i>)
Giant salvinia	(<i>Salvinia molesta</i>)
Hydrilla	(<i>Hydrilla verticillata</i>)
Japanese knotweed	(<i>Polygonum cuspidatum</i>)
Giant knotweed	(<i>Polygonum sachalinense</i>)
Bohemian knotweed	(<i>Polygonum x bohemicum</i>)
Meadow knapweed	(<i>Centaurea pratensis</i>)
Mediterranean sage	(<i>Salvia aethiopis</i>)
Medusahead	(<i>Taeniatherum caput-medusae</i>)
Myrtle spurge	(<i>Euphorbia myrsinites</i>)
Orange hawkweed	(<i>Hieracium aurantiacum</i>)
Purple loosestrife	(<i>Lythrum salicaria</i>)
Rush skeletonweed	(<i>Chondrilla juncea</i>)
Squarrose knapweed	(<i>Centaurea virgata</i>)
Tansy ragwort	(<i>Senecio jacobaea</i>)
Yellow starthistle	(<i>Centaurea solstitialis</i>)

List B Species (37)

<i>Common</i>	<i>Scientific</i>
Absinth wormwood	(<i>Artemisia absinthium</i>)
Black henbane	(<i>Hyoscyamus niger</i>)
Bouncingbet	(<i>Saponaria officinalis</i>)
Bull thistle	(<i>Cirsium vulgare</i>)
Canada thistle	(<i>Cirsium arvense</i>)
Chinese clematis	(<i>Clematis orientalis</i>)
Common tansy	(<i>Tanacetum vulgare</i>)
Common teasel	(<i>Dipsacus fullonum</i>)
Corn chamomile	(<i>Anthemis arvensis</i>)
Cutleaf teasel	(<i>Dipsacus laciniatus</i>)
Dalmatian toadflax, broad-leaved	(<i>Linaria dalmatica</i>)
Dalmatian toadflax, narrow-leaved	(<i>Linaria genistifolia</i>)
Dame's rocket	(<i>Hesperis matronalis</i>)
Diffuse knapweed	(<i>Centaurea diffusa</i>)
Eurasian watermilfoil	(<i>Myriophyllum spicatum</i>)
Hoary cress	(<i>Cardaria draba</i>)
Houndstongue	(<i>Cynoglossum officinale</i>)
Jointed goatgrass	(<i>Aegilops cylindrica</i>)
Leafy spurge	(<i>Euphorbia esula</i>)
Mayweed chamomile	(<i>Anthemis cotula</i>)
Moth mullein	(<i>Verbascum blattaria</i>)
Musk thistle	(<i>Carduus nutans</i>)
Oxeye daisy	(<i>Chrysanthemum leucanthemum</i>)
Perennial pepperweed	(<i>Lepidium latifolium</i>)
Plumeless thistle	(<i>Carduus acanthoides</i>)
Quackgrass	(<i>Elytrigia repens</i>)
Russian knapweed	(<i>Acroptilon repens</i>)
Russian-olive	(<i>Elaeagnus angustifolia</i>)
Salt cedar	(<i>Tamarix chinensis</i> , <i>T. parviflora</i> , and <i>T. ramosissima</i>)
Scentless chamomile	(<i>Matricaria perforata</i>)

Scotch thistle	(Onopordum tauricum)
Spotted knapweed	(Centaurea maculosa)
Spurred anoda	(Anoda cristata)
Sulfur cinquefoil	(Potentilla recta)
Venice mallow	(Hibiscus trionum)
Wild caraway	(Carum carvi)
Yellow nutsedge	(Cyperus esculentus)
Yellow toadflax	(Linaria vulgaris)

List C Species (15)

<i>Common</i>	<i>Scientific</i>
Bulbous bluegrass	(Poa bulbosa)
Chicory	(Cichorium intybus)
Common burdock	(Arctium minus)
Common mullein	(Verbascum thapsus)
Common St. Johnswort	(Hypericum perforatum)
Downy brome	(Bromus tectorum)
Field bindweed	(Convolvulus arvensis)
Halogeton	(Halogeton glomeratus)
Johnsongrass	(Sorghum halepense)
Perennial sowthistle	(Sonchus arvensis)
Poison hemlock	(Conium maculatum)
Puncturevine	(Tribulus terrestris)
Redstem filaree	(Erodium cicutarium)
Velvetleaf	(Abutilon theophrasti)
Wild proso millet	(Panicum miliaceum)

Watch List Species (26)

<i>Common</i>	<i>Scientific</i>
Asian mustard	(Brassica tournefortii)
Baby's breath	(Gypsophila paniculata)
Bathurst burr, Spiny cocklebur	(Xanthium spinosum)
Brazilian elodea	(Egeria densa)
Common bugloss	(Anchusa officinalis)
Common reed	(Phragmites australis)
Flowering rush	(Butomus umbellatus)
Garlic mustard	(Alliaria petiolata)
Hairy willow-herb	(Epilobium hirsutum)
Himalayan blackberry	(Rubus armeniacus)
Japanese blood grass/cogongrass	(Imperata cylindrica)
Meadow hawkweed	(Hieracium caespitosum)
Onionweed	(Asphodelus fistulosus)
Pampas grass	(Cortideria jubata)
Parrotfeather	(Myriophyllum aquaticum)
Scotch broom	(Cytisus scoparius)
Sericea lespedeza	(Lespedeza cuneata)
Swainsonpea	(Sphaerophysa salsula)
Syrian beancaper	(Zygophyllum fabago)
Water hyacinth	(Eichhornia crassipes)
Water lettuce	(Pistia stratiotes)
White bryony	(Bryonia alba)
Woolly distaff thistle	(Carthamus lanatus)
Yellow flag iris	(Iris pseudacorus)
Yellow floatingheart	(Nymphoides peltata)
Yellowtuft	(Alyssum murale, A. corsicum)

NOXIOUS WEED MANAGEMENT PLAN WALDEN PRESERVE 2 SUBDIVISION

July 19, 2014

The developers of the Walden Preserve 2 subdivision are currently making application to El Paso County for Preliminary Plan approval which would allow for the development of 116 single family residential lots (1.0 ac min. size) and 72.33 acres of open space on the 208 acre parcel. See attached Preliminary Plan.

The subdivision is located in northern El Paso County and can be characterized as open meadow grasslands interspersed with limited clumps of smaller Ponderosa Pines. See attached Vicinity Map. A major drainage way bisects the site from south to north. The drainage way facilitates 2 ponds and a limited area of wetlands.

Construction of the 116 lots and the human habitation of the lots and open space will tend to increase the potential for noxious weed infestations. Noxious weed management techniques and responsibilities will vary depending upon ownership of the various land parcels.

SINGLE FAMILY RESIDENTIAL LOTS

The 116 single family residential lots will be owned and maintained by the individual lot owners. The subdivision's covenants and restrictions require that each lot is maintained noxious weed free. The property owner's association is tasked with identification and enforcement responsibilities. The association will also make available to each lot owner a copy of the Colorado State University Extension publication titled "Weed Management for Small Rural Acreages" (copy attached) and will assist the lot owner in weed management techniques. As detailed in the referenced publication, the lot owners and the property association will utilize recommended techniques of prevention, eradication, control and weed management system integration.

OPEN SPACE

The 72.33 acres of open space is intended to facilitate a number of passive recreational opportunities including an El Paso County regional trail link. The property will initially

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remain in the ownership of Walden Holdings I, LLC. Eventually, the open space will be owned and maintained by the Walden Metropolitan District. The owner of the open space will be responsible for noxious weed management on the property and will utilize the resources of the Colorado State University Extension in managing the noxious weeds. Similar to the single family residential lots, the smaller portions of the open space will utilize the prevention, eradication, control and integration techniques detailed in the "Weed Management for Small Rural Acreages" publication. A few of the large open space parcels will require a more global management scope. In these larger areas, the owner will be required to utilize techniques identified the CSUE's publication "Range, Pasture and Natural Area Weed Management (copy attached) including evaluation, mapping, integrated management of control systems and record keeping.

STANDARD DISC PUBL. IN NOTES

DEVELOPMENT NOTES

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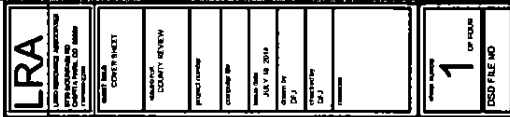
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1. INTRODUCTION AND DESCRIPTION

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VICINITY MAP

In spring, treat before musk thistle bolts or it may recover and develop seed, although Milestone may be applied into the bolting growth stage. Apply Telar or Escort at 1 ounce or 0.5 ounce/A, respectively. Add a good agricultural surfactant to the spray mixture at 0.25 percent v/v. Apply in spring when musk thistle is in the rosette- to early-flower growth stages. If treating in early flower, do not allow the pink portion of the developing flower to exceed the size of a dime. Research at Colorado State University indicates little to no viable seed is formed when Telar or Escort are applied during these growth stages.

The musk thistle seedhead weevil (*Rhinocyllus conicus*) is widespread in Colorado. Larvae of this insect destroy developing seeds but are not 100 percent effective by themselves. Musk thistle has flowers in various growth stages at once and the weevil's life cycle usually is finished before all flowers develop. Apparently, the weevil typically decreases seed production by about 50 percent. Herbicides can be combined with weevils if the insects are allowed to complete their life cycles. Telar or Escort, applied at early flower in spring or Tordon or Banvel/Vanquish/Clarity + 2,4-D in fall, should allow this. The musk thistle seedhead weevil is no longer being distributed in the U.S. because it is not specific to musk thistle and will attack native thistles. The musk thistle rosette weevil (*Trichosiromus horridus*) is available from the Colorado Department of Agriculture. Larvae feed on the meristems of rosettes and developing shoots, causing plants to be less vigorous and produce fewer seeds.

Diffuse Knapweed

Diffuse knapweed (Figure 7 and 8) is a short-lived perennial, biennial, or occasionally an annual. The key to management is to prevent it from going to seed. Diffuse knapweed invades overgrazed pastures, forms dense stands and may be toxic to horses. After a herbicide treatment, reseed a poor-conditioned pasture so grasses can be present to compete with surviving diffuse knapweed and prevent re-invasion by the weed.

Spring- or fall-applied herbicides are effective. Research conducted at Colorado State University indicates Tordon at 1 pint/A, Milestone at 5 to 7 fluid ounces/A, or Banvel/Vanquish/Clarity + 2, 4-D at 0.5 + 1.0 quart/A, applied in spring from rosette to early-bolt growth stages, are effective. Curtail at 2 to 3 quarts/A and Transline at 0.67 to 1 pint/A also readily control diffuse knapweed when applied at the rosette to early-bolting growth stage. Use the higher rate of Milestone, Transline, or Curtail on old or dense stands of diffuse knapweed.

The Colorado Department of Agriculture offers several biological control agents. The knapweed gall flies (*Urophora affinis* and *U. quadrifasciata*) are readily available. Females lay eggs in developing flowers. As they feed on heads, the larvae incite gall formation, which reduces seed formation.

The gall fly overwinters inside the seed head as larvae. The normal procedure for redistribution is to cut last year's dead stand that contain larvae and tie the bouquet to a fence post near knapweed

stands. Adults will emerge in spring and repeat the life cycle. Using biocontrol that affects the vegetative growth stage may be most effective to decrease diffuse knapweed populations.

The diffuse knapweed root beetle (*Sphenoptera jugoslavica*) has been the most successful insect to date in Colorado, but its availability is limited. The knapweed root weevil and *Cyphocleonus achates* also attacks vegetative growth and is available from the Colorado Department of Agriculture. The knapweed seedhead weevil (*Larinus minutus*), also available from the Colorado Department of Agriculture, is an extremely aggressive and effective biocontrol insect for diffuse and spotted knapweed. Larvae consume knapweed seeds and up to 100 percent of seeds may be destroyed in an infested seedhead. When larval development is complete, larvae pupate then emerge from the seedhead as adults and consume foliage of diffuse and spotted knapweed until they enter the litter and soil to overwinter.

As with any integrated weed-management system, biocontrol should be combined with seeding of perennial grasses.

Range, Pasture and Natural Area Weed Management

Fact Sheet No. 3.105

Natural Resources Series | Range

by K.G. Beck*

Weeds are spreading rapidly on Colorado rangeland and in pastures and natural areas. Manage weeds during the current growing season to decrease or prevent future infestations. All too often, weed control during a growing season is evaluated in terms of financial return only for that season and not for future impact.

All weed management must be applied and evaluated over an extended time to be successful. This is particularly important with rangeland, pasture, or natural area weed management programs. A good manager develops a comprehensive weed management plan and incorporates that plan into a long-term land management program; i.e., weeds are managed to achieve overall land use goals and objectives.

Be persistent in weed management, particularly with perennial weeds. Most successful weed management systems require input for several growing seasons. Weed infestations occur over time and seldom can be cured in a single growing season. Soil seed dormancy of most weeds and the extensive root systems of creeping perennials requires that weed management systems in rangeland, pasture and natural areas need to be designed for input over extended time periods.

Mapping

A comprehensive weed management plan has several key features. First, develop an accurate map of weed infestations. Include information about infestation locations and weed species within those locations. Also, indicate the type of infestation:

- scattered infestations less than 10 yards in diameter with just a few plants;
- light infestations made up of small patches up to 0.5 to 1 acre in size;

- moderate infestations from 1 to 10 acres; or
- large dense infestations greater than 10 acres.

Additionally, include the productive value of land where infestations are located to help determine how much money to spend on weed management during any year and over time. Also, determine habitat, e.g. rangeland, irrigated pasture, around ponds or along streams and rivers, and associated desirable plant species, as these will help you choose appropriate control tools.

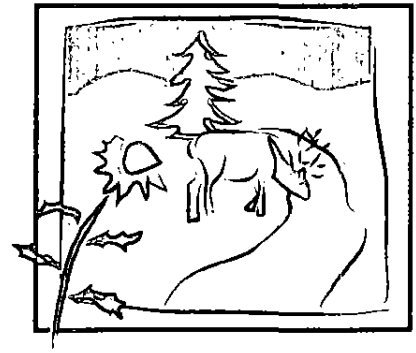
Integrate Control Methods

A key aspect to weed management is to integrate control methods into a management system.

- Cultural controls are methods that favor desirable plant growth, such as proper grazing management, irrigation, and seeding vigorously growing, competitive, desirable plant species.
- Mechanical control physically disrupts weed growth and includes such methods as tillage, mowing, mulching, burning, and flooding.
- Chemical control is the use of herbicides.
- Biological control is the use of an organism to disrupt weed growth. Classical biological control uses natural enemies of weeds, such as insects or disease organisms. Biological control also may include use of sheep, cattle, goats, or other large herbivores to control weeds.

A good weed-management plan integrates two or more control measures into a management system. For example, if a pasture is infested with leafy spurge:

1. **Biological control:** Use sheep or goats to graze the weed during the growing season to relieve desirable plants from intense weed competition.
2. **Cultural control:** Irrigate, where applicable, to further stimulate desirable plant growth to provide better



Quick Facts

- Weeds are managed to achieve overall land use goals and objectives.
- All weed management must be applied and evaluated over an extended time to be successful.
- Mapping weed infestations is the first step in pasture, rangeland, and natural area weed management.
- Integrate two or more control methods into a system of management.
- Control small, scattered or perimeter infestations before large, dense ones.
- Keep accurate records of control procedures and evaluate for success or failure.

*Colorado State University Extension weed science specialist and professor, bioagricultural sciences and pest management. 11/2013



competition with leafy spurge. These two procedures allow effective pasture use by other livestock, such as cattle, that normally do not graze leafy spurge.

3. **Chemical control:** In the fall, spray the infestation with Tordon 22K (picloram), Plateau (imazapic), or Perspective (aminocyclopyrachlor + chlorsulfuron) to control leafy spurge.

This example integrates biological, cultural and chemical controls into a weed management system. If leafy spurge is the weed problem, you may have to repeat this program most growing seasons. With this procedure, you can still use that land and see a return on your weed management investment.

Systematic Control Procedures

Do not attempt to control all weed infestations in a single season, except on small land parcels. The mapping procedure will indicate where dense infestations lie and where small scattered or perimeter infestations are located.

Be systematic about weed management. Start with perimeter infestations. These are the easiest and most affordable to control. If controlled first, they can be kept from becoming large and dense. If you start with large, dense infestations, perimeter ones often get worse. This leads to frustration and a sense of futility in weed management.

A good weed-management plan integrates two or more control measures into a management system.

Be systematic about weed management.

Keep good records of weed management.

A systematic approach allows for a return on the control investment during the weed management process. Ground that was lightly infested can be used for productive purposes, then some of that profit used to combat heavier infestations.

Record Keeping and Evaluation

Keep good records of weed management. Include procedures used, dates applied, weather conditions, and growth stage and condition of weeds and desirable plants. Evaluate for success or failure. Good records and evaluation lead to successful management and fewer failures.

Often, evaluation efforts provide the most accurate assessment one to three years after control application. This is important for perennial weeds where follow-up is a key to successful weed management. The worst mistake to make is to use a weed management system, assume it will work, and not evaluate the outcome.

NOXIOUS WEED MANAGEMENT PLAN

(with sample text for illustrative purposes)

Parcel / Schedule Number(s):

See: <http://land.elpasoco.com/>

Property Owner(s):

Last Name:	First Name:
Last Name:	First Name:
Last Name:	First Name:
Last Name:	First Name:
Business:	
Trustee:	

Property Address:

Street:	
City:	State, Zip code:

Prepared by:

Date:

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Introduction: Describe the area and the purpose of the management plan.

Example

Property is 150 acres in northern El Paso County near Black Forest. The property sits at an elevation of 7,200 ft. Parcel consists of grassy areas with a few pockets of ponderosa pine. Lower part of property near road has an intermittent stream bordered by willows and other shrubs. Property will be subdivided into 10 acre parcels to sell.

Survey/Inventory: Describe how the property was surveyed and list the noxious weeds found. Estimate the size of infestation. Include a map if possible. View the Colorado Noxious Weed List at Colorado Department of Agriculture (CDA) <http://www.colorado.gov/ag/weeds>.

Example

Property was inventoried by XYZ & Associates. One area (20' x 20') of orange hawkweed was found in meadow near road. Two pockets of diffuse knapweed were also found. The first area is approximately 100' x 1000' and found near the NW property boundary and the second is approximately 30' x 100' and found just below the meadow (see accompanying map).

Management Goals: State the goal to eradicate, contain or suppress, noxious weed infestations on the property. Promote desirable self-sustaining native plant communities in areas where construction or other ground-disturbing activities will take place. All List A and High Priority List B species must be eradicated prior to any disturbance and notations to prevent the spread of all noxious weeds during the development must be addressed.

Example

Eradicate the Orange hawkweed, a List A species, and reseed with native plants adapted to this area.

Control the spread of diffuse knapweed near property boundary and reduce the density to 50% or less within two years. Within five years, lower population to a low level manageable by beneficial insects. Reduce density of smaller patch near the meadow to less than 50% within two years. Eliminate this patch completely within four years.

Example Ground Disturbing Activities

Eradicate the Orange Hawkweed before **any** ground disturbing activity begins. (**NOTE:** eradication is required for all List A and high priority List B species prior to any ground movement.)

Control the spread of diffuse knapweed in all areas of the property. Make every attempt to keep any noxious weeds from leaving the sites by employing proper contain and control procedures.

Ensure that all equipment leaving the parcel is free of weed seeds or other plant parts. Clean seeds from tires, tracks and all other parts of machinery.

Prevent seed spread prior to any activity on the site, along with continued treatment during the construction. Clip, bag, and securely dispose of all noxious weed seeds and plant parts.

Control Methods: Detail the Integrated Pest Management (IPM) plan. Provide information on control methods for specific noxious weeds. Fact sheets for most species are found at: <http://www.colorado.gov/cs/Satellite/Agriculture-Main/CDAG/1167928170082> List which IPM measures will be applied to each species of noxious weed found in the management area using the following format:

- a. **Cultural/Mechanical** – Mowing, hand-pulling, irrigation, etc. Whenever possible, follow any control measure with an over-seeding using native plants adapted to the area. It is important whenever there is a disturbance to an area that has noxious weeds, to prevent the spread of seeds to other areas of land by equipment, vehicles, clothing and shoes.
- b. **Biological** - Contact the CDA at:
<http://www.colorado.gov/cs/Satellite/Agriculture-Main/CDAG/1167928159775>
for recommended control of each specific plant species.
- c. **Chemical** – List chemical controls by active ingredient and product name.

Example

Orange hawkweed: List A species

- a. Mechanical: Not recommended for orange hawkweed.
- b. Biological: Not available. Eradication is the only option for List A species
- c. Chemical: There are several herbicides that control orange hawkweed effectively;
Aminopyralid, Clopyralid, Picloram or 2,4-D.

Diffuse knapweed: List B species.

- a. Mechanical: Sever roots with a shovel well below the soil line.
- b. Biological: The CDA has several beneficial insects available for diffuse knapweed control including a weevil that feeds on the seed head and another weevil that feeds on the roots.
- c. Chemical: Several herbicides are available that control diffuse knapweed effectively;
Aminopyralid, Clopyralid or 2,4-D.

Example Ground Disturbing Activities

(The same as above, appropriate to the season as outlined by the CDA)

Timeline of Activities: Provide a specific timeline for each noxious weed management activity. Noxious weed management activities should be planned for the most susceptible time in the plants life cycle in order to achieve the most effective control. The CDA fact sheets referenced above will assist in determining the most appropriate timing. All List A and high priority List B will be eradicated before ground disturbance takes place.

Example

Orange Hawkweed will be sprayed in the rosette growth stage (spring to early summer).
Diffuse knapweed will be dug during spring and fall rosette stage.
Spraying should be during bolting stage and fall rosette stage if present.
Biological control organisms release as recommended by CDA.

Example Ground Disturbing Activities

(The same as above, appropriate to the season as outlined by the CDA)

Monitoring and Evaluation: Explain how and when monitoring will be conducted, how the effectiveness of applied management treatments will be evaluated, and how the records of activities and evaluations will be kept.

Example

Photos of all noxious weed areas will be taken from specific locations marked with a metal stake before treatment begins. Determine area (size) of all noxious weed patches. Short-term evaluations will be made by photo and visual counts after each treatment and long-term success will be measured and recorded each year and compared to management goals.

Assistance: El Paso County Community Services Department, Environmental Division at 719-520-7846.