Invasive Plant Management in the West – A Scientific Assessment

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Burns, Oregon
We asked:

Is the science available to achieve our conservation goals during invasive plant management?
Conservation goals

- Protect non-infested rangeland
- Enhance quality and quantity of goods
- Control undesirable vegetation
- Create desired plant communities
- Repair the underlying cause of invasion
- Restore vegetation to protect soils
- Protect and enhance wildlife
- Protect life and property from wildfires
- Minimize negative impacts
Stop treating Symptoms

What are we going to do about this?
What is Ecologically Based Invasive Plant Management?
Plant communities are always changing

What caused this?

What can we do to cause this?
Prioritizing Management

No/Light Infestation

- Prevention/Protection
- Develop prevention plan & gain adoption with adjacent land owners
- Prioritize prevention program. Implement the program
- Assess and improve

Moderate Infestation with Some Desired Plants

- Management Focus
- Control infestation & increase desired species
- Detailed mapping combined with environmental data & local knowledge
- Develop control methods to favor desired species using EBIPM
- Design Adaptive Management program and implement
- Assess and improve

High Infestation without Desired Species

- Revegetation/Restoration
- Highly accurate mapping with max environmental data & local knowledge
- Contain large infestations
- Develop an Augmentative Restoration plan
- Implement restoration plan & establish adaptive management program
- Assess and improve

Highest Priority Level & Likelihood of Success

- Lowest Priority Level & Likelihood of Success
Management Focus – Prevention

No/Light Infestation

Develop prevention plan & gain adoption for adjacent land owners

Prioritize prevention program. Implement the program

Assess and improve
Prevention Plan

Education

Interruption of Movement

Early Detection & Eradication
WEED Prevention Areas

Attention All Hunters When Spotted Call 357-3200

Entering Weed Prevention Area

Protecting Garfield County from invasive weeds.
Weed Prevention Framework

Create goals

Create list of priority species for prevention

Create general map of known infestations and weed free areas

Education

Develop and deliver education/awareness program

Logic Model for Activity Planning

Activity Ideas

Early Detection & Eradication

Identify protection, action, and containment zones

Delineate boundaries for each of the zones

Frequently: Survey boundary zones

Maintain containment zone boundaries

Interrupting Movement

Identify spread vectors and corridors of movement

Develop and implement comprehensive program for limiting spread of weeds

Frequently: Survey spread corridors in action zones

Eradicate all infestations within action zones, corridor areas, and high risk zones

Anually:
Survey high risk areas out of the action zone and in the protection zone

Create risk assessment map

GPS location in an

Management Focus – Control infestations and increase desired species

- Detailed mapping combined with environmental data & local knowledge
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Moderate Infestation with Some Desired Plants

Management Focus

Control infestation & increase desired species
Prescribed Burning Options
Considerations

- High amount of combustible forage increases fire intensity and greater seed mortality.
- Shown more effective in low elevation, warm winter areas with high biomass production generally not as successful in semi-arid cool winter areas.
- Can be used prior to herbicides to remove thatch buildup
Herbicide Options

Control is highly variable; gives about 2 years control. Herbicides and burning better control; more risky and expensive.

Weeds return rapidly if niches are not filled.
Grazing Options
Principle 1: Keep Annual Grasses from Flowering
Principle 2: Keep Perennial Desired Species Strong and Healthy
“Green and Brown”
Grazing Strategy for Invasive Annual Grasses

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<td>Dormancy</td>
<td>Growth initiation</td>
<td>Leaf growth</td>
<td>Boot stage &amp; seed head emergence</td>
<td>Flowering &amp; seed development</td>
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High Infestation without Desired Species

Management Focus

Revegetation/Restoration

Highly accurate mapping with max environmental data & local knowledge

Contain large infestations

Develop an Augmentative Restoration plan

Implement restoration plan & establish adaptive management program

Assess and improve

Management Focus - Revegetation
The goal is to:

- Maximize productivity
- Maximize diversity

Leads to:

Healthy functioning plant communities that are invasion resistant and meet other land use objectives
Restoration costs and outcomes

40,000 acres

- Crested ($40/ac) $1.6 million 50% chance $0.8 million
- Natives ($100/ac) $4 million 25% chance $3 million
- Natives with invaders ($150/ac) $6 million <5% chance $5.9 million

Cost

Loss
Determine if revegetation is necessary

YES

NO

YES= < 15% cover of desired plants

NO= > 15% cover of desired plants
DETERMINE SEEDING OR PLANTING METHOD

Is the site accessible to equipment?

No

• Broadcast seed at non-prepared seedbed at double to triple seeding rate.
• Hand-plug wetland riparian plants.

Yes

• Hydroseed sloped sites.
• Roughen soil surface before and after broadcast seeding and apply hydromulch.
• Hay mulch seed.
• Plant rhizome sprigs in high-salinity sites.
DESIGN A SEED MIX
Create seed mix based on goals and site characteristics.
Is the site a natural area?

No

Always use native species when their abilities meet your needs. Non-natives are sometimes the only choice when needs are based on considerations like forage production and competitiveness with invasive weeds.

Yes

Use native species to provide ecological stability and maintain plant community integrity.
CALCULATE SEEDING RATE

Rates vary depending on many factors.

Ecological Principles:
Increase dispersal frequency and increase amounts of desired species increases establishment

Factors

Weed interference
Seedling vigor
Site conditions
Seed mix components
Adaptive Management

Create controls and replication to identify and rectify problems in time to allow for successful revegetation.

Design and Execute a Plan Using Adaptive Management
Prioritizing Management

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Highest Priority Level & Likelihood of Success

Lowest