

**Upper Arkansas Cooperative Weed
Management Areas Annual Meeting
November 5, 2014**

NATIVE WILDLIFE AND NOXIOUS WEEDS

**Jeff Thompson
Colorado Parks & Wildlife**



NOXIOUS WEED QUICK FACTS



NOXIOUS WEED QUICK FACTS

- **Noxious weeds easily infest over 100 million acres of North America**
- **Noxious weeds invade an estimated 6 square miles of BLM and USFS land annually**
- **Invasive species, both plants and animals combined, are the second leading cause of animal extinction**

NOXIOUS WEEDS IMPACT WILDLIFE



NOXIOUS WEEDS IMPACT WILDLIFE

- **Most resident wildlife do not travel or migrate large distances**
- **Most wildlife rarely travel more than $\frac{1}{4}$ to $\frac{1}{2}$ mile from the place where they were born**
- **Food, Water, Cover, and Space can be impacted by Noxious Weeds**
- **Impacts to habitat can reduce wildlife health, populations, and the carrying capacity of an area**

WILDLIFE HABITAT





WILDLIFE HABITAT

To properly manage land for the benefit of wildlife, landowners must be aware of those things in the environment that animals need to survive and reproduce.

WILDLIFE HABITAT

What makes good habitat for wildlife?

- Food
- Water
- Cover
- Space



FOOD



FOOD

Animals that have adequate food and proper nutrition have:

- Higher reproductive rates
- More resistance to disease
- Better chances to escape predators



FOOD

4 Food Preferences:

- #1 ***Preferred*** – more abundant in the animal's diet compared to abundance in the habitat
- #2 ***Staple*** – food eaten on a regular basis and meets nutritional needs of the animal
- #3 ***Emergency*** – food eaten to fulfill short-term nutritional needs
- #4 ***Stuffers*** – food eaten because there is nothing else to eat

WATER



WATER

Sources of Water for Wildlife

#1 Free standing water

#2 Plants - Wildlife can also obtain water through:

- Consumption of green plants
- Dew on leaves

#3 Metabolism – breakdown of fat and starch

COVER



COVER

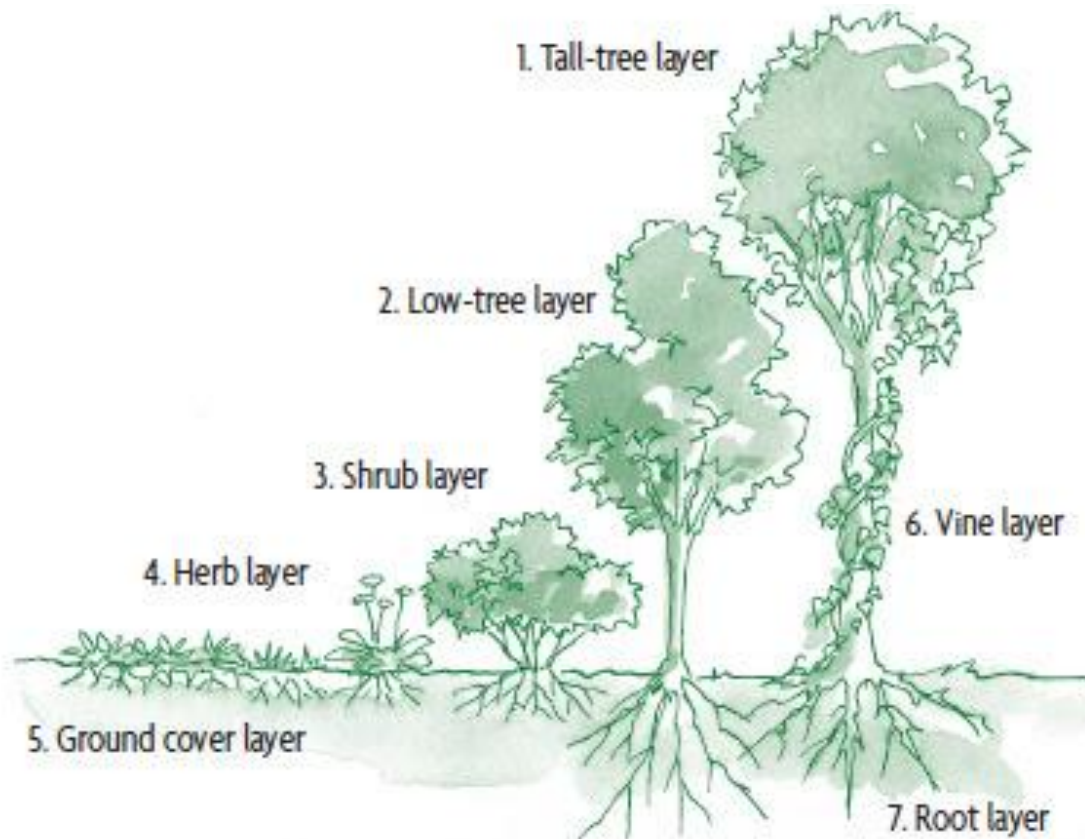
Wildlife Need Places to:

- **Hide**
- **Rest**
- **Move About**
- **Mate**



COVER

Multiple Components of Habitat Structure



COVER

Habitat Needs: Structure, Composition, and Diversity
Specific Needs Vary Between Species

Structural Needs –

Underground burrows, grasses, shrubs, trees

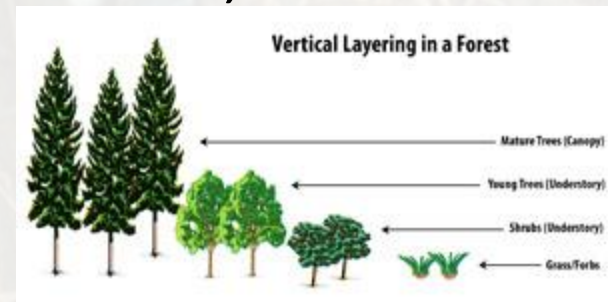
Vertical layers of habitat

Composition Needs –

Different combinations of cover types

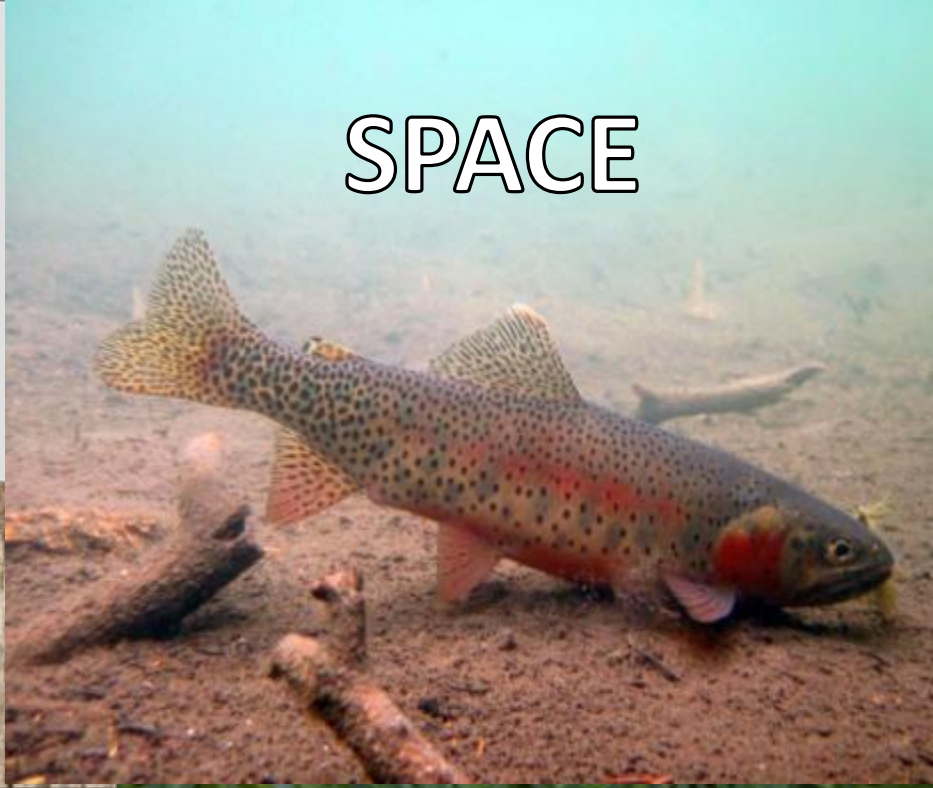
Diversity Needs –

Different combinations of species





©MMJ



SPACE





SPACE

SPACE = Home Range of an Animal

- Amount of space needed is determined by the quantity and quality of food, cover, and water
- Space requirements determine the **carrying capacity**, or the amount of each species, an area can support



Why Do We Care About Invasive Species?



Why Do We Care About Invasive Species?

Noxious Weeds –

- Have a competitive advantage over many native species
- Can have a tendency to form monocultures
- Have a lack of local natural controls

Why Do We Care About Invasive Species?

And Equally Important – What Weeds Impact

Noxious weeds impact species that we deem necessary or desirable

- Native Wildlife
- Native Plants
- Agricultural Crops
- Agricultural Livestock

Noxious Weeds Impact Wildlife



Noxious Weeds Impact Wildlife

What makes good habitat for wildlife?



Noxious Weeds Impact Wildlife

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Noxious Weeds Impact Wildlife

Impacts to FOOD:

- Replace vegetation that wildlife or their prey rely on as a ***Preferred*** food source. (**primary nutrition**)
- Replace vegetation that wildlife or their prey rely on as ***Staple*** food source (**secondary nutrition**)
- Replace ***Emergency*** and ***Stuffer*** food sources

Noxious Weeds Impact Wildlife



Noxious Weeds Impact Wildlife

Impacts to WATER:

- Replacement of riparian vegetation with water-loving noxious weeds modifies water cycles

= Less water flow/Lower water table

Less water available for wildlife use (both terrestrial and aquatic), and

Increases the effects of drought

Noxious Weeds Impact Wildlife

Impacts to WATER:

- Replacement of stream bank vegetation with species with less bank stabilization qualities

= Stream Bank Erosion

Sediment in the water and fluctuating stream morphology

- *reduces water quality, as well as*
- *habitat quality for wildlife*

Noxious Weeds Impact Wildlife

Impacts to WATER:

- When stream bank vegetation is replaced with species that do not shade water

= Warmer Water

Changes in fish & amphibian habitat & species composition

Including changes in aquatic insect & plant composition

Noxious Weeds Impact Wildlife

Impacts to WATER:

- In wetland areas, weeds like purple loosestrife and tamarisk can deter wildlife access to water sources.





Habitats Infested with Noxious Weeds Cause Animals to Need More SPACE and to Travel Farther in Search of Resources



Noxious Weeds Impact Wildlife

Noxious Weeds Can Change Fire Regimes



Noxious Weeds Impact Wildlife

Noxious Weeds Can Change Fire Regimes

Wildfire intensity, duration, and intervals change

Wildfires alter habitat structure

- **FOOD** – Impacts and changes to *Preferred* and *Staple* food source impacts

Noxious Weeds Impact Wildlife

Noxious Weeds Can Change Fire Regimes

Wildfire intensity, duration, and intervals change

Wildfires alter habitat structure

- **WATER** – Changes to water flow, soil permeability, surface water availability

Noxious Weeds Impact Wildlife

Noxious Weeds Can Change Fire Regimes

Wildfire intensity, duration, and intervals change

Wildfires alter habitat structure

- **COVER** – Changes to and elimination of habitat structural components (vertical layers of the habitat)

Noxious Weeds Impact Wildlife

Noxious Weeds Can Change Fire Regimes

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Wildfires alter habitat structure

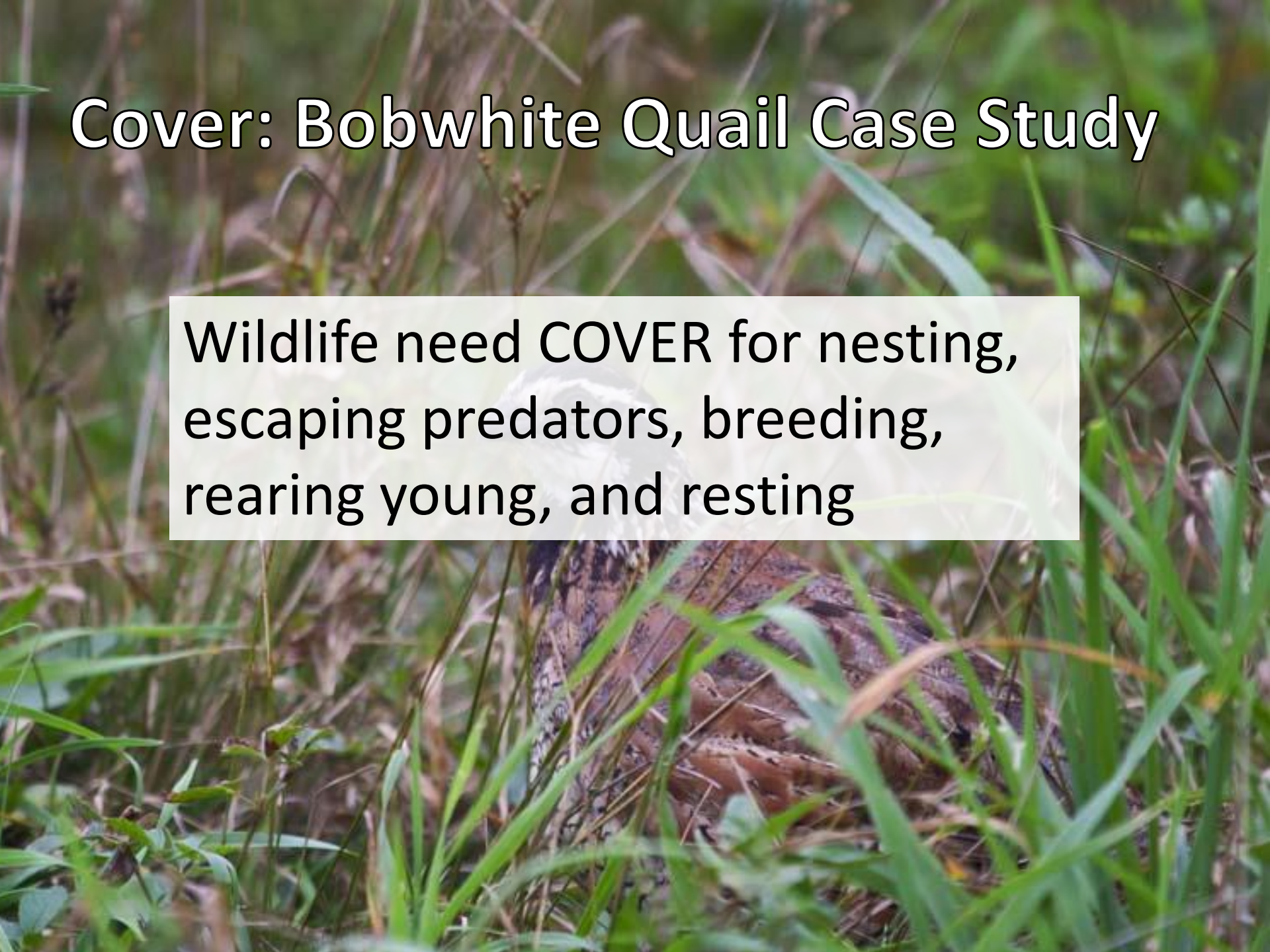
- **SPACE** – Can decrease the carrying capacity of a landscape by reducing the amount of viable habitat

Cover: Bobwhite Quail Case Study



Cover: Bobwhite Quail Case Study

Wildlife need COVER for nesting, escaping predators, breeding, rearing young, and resting



Cover: Bobwhite Quail Case Study

A Bobwhite Quail is shown in a field of tall grass. The quail is positioned in the lower center of the frame, partially obscured by the blades of grass. Its body is covered in brown and white mottled patterns, which help it blend into the natural environment. The background consists of a dense field of green and brown grasses, creating a textured and somewhat blurred backdrop.

Wildlife need a variety of cover types for different life functions and activities throughout the year

Cover: Bobwhite Quail Case Study

The Cover requirement for Bobwhite quail is a mixture of:

- 30 – 40% Grassland
- 40 – 60% Cropland/Herbaceous Vegetation
- 5 – 40% Shrubby Woodland

Cover: Bobwhite Quail Case Study

Cover Types Needed for Bobwhites:

- **Nesting Cover** – grass/broadleaf veg mixture with some bare ground



Cover: Bobwhite Quail Case Study

Cover Types Needed for Bobwhites:

- **Nesting Cover** – grass/broadleaf veg mixture with some bare ground
- **Roosting & Loafing** – grasslands with short statured veg approx 2 ft high with open canopy



Cover: Bobwhite Quail Case Study

Roosting & Loafing – grasslands with short statured veg approx 2 ft high with open canopy



Don't Take My Loafing Habitat!



Cover: Bobwhite Quail Case Study

Cover Types Needed for Bobwhites:

- **Nesting Cover** – grass/broadleaf veg mixture with some bare ground
- **Roosting & Loafing** – grasslands with short statured veg approx 2 ft high with open canopy
- **Escape Cover** – low growing shrubby/woody veg

Cover: Bobwhite Quail Case Study

Escape Cover – low growing shrubby/woody vegetation



Cover: Bobwhite Quail Case Study

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- **Brood-rearing** – insect rich mixes of herbaceous veg with some bare ground

Cover: Bobwhite Quail Case Study



Brood-rearing Cover– insect rich mixes of herbaceous vegetation with some bare ground

Cover: Bobwhite Quail Case Study

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- **Winter/Thermal** – dense ground cover under woody canopy

Cover: Bobwhite Quail Case Study

Winter/Thermal Cover – dense ground cover under woody canopy



Cover: Bobwhite Quail Case Study

Weed invasion in one cover type could lead to:



Cover: Bobwhite Quail Case Study

Weed invasion in one cover type could lead to:

- **Failed Nesting – weeds fill in bare ground component or eliminate herbaceous component**



Cover: Bobwhite Quail Case Study

Weed invasion in one cover type could lead to:

- **Predation – weeds change roosting/loafing/escape cover composition**
- **Changes in habitat could cause species to move through areas without appropriate escape cover**



Cover: Bobwhite Quail Case Study

Weed invasion in one cover type could lead to:

- **Winter mortality**



Cover: Bobwhite Quail Case Study

What would weed invasion into multiple cover types lead to?



Noxious Weeds and Grazing



Noxious Weeds and Grazing

- Areas of leafy spurge receive three times less use by ungulates compared to uninfested areas
- Knapweed infestations can reduce winter forage for ungulates by 50-90%



Noxious Weeds Impact Wildlife



Noxious Weeds Impact Wildlife

- Changes in habitat structure can eliminate places for wildlife to reproduce, winter/hibernate, rest, and escape from predators.
- Changes in vegetation diversity can eliminate Preferred, Staple, and Emergency food sources
- Species need food, water, and cover in proximity to one another.

Noxious Weeds Impact Recreation



Noxious Weeds Impact Recreation

- Weeds like Saltcedar and Russian Olive reduce fishing access to streams
- Spiny weeds like puncture vine reek havoc on trail use
- Weed seeds like those of Cheatgrass and Houndstongue transport easily on hikers
- Aquatic weeds like Eurasian Water Milfoil reduce fish habitat quality and limit boating and swimming

After

Noxious Weeds Impact Recreation

Colorado Study:

Economic Impacts of Noxious Weeds on Recreation

(COST PER YEAR)

| District | Ag | Habitat | Rec | Total |
|-----------------|--------------------|--------------------|--------------------|---------------------|
| NW & Mtn NE | \$28,346 | \$77,021 | \$53,919 | \$159,286 |
| Northeast | \$2,328,473 | \$2,159,497 | \$1,602,314 | \$6,090,283 |
| East Central | \$749,567 | \$1,082,528 | \$1,223,230 | \$3,055,397 |
| Southwest | \$646,831 | \$1,080,528 | \$733,403 | \$2,460,763 |
| San Luis Valley | \$326,075 | \$411,370 | \$462,611 | \$1,200,055 |
| Southeast | \$200,901 | \$336,689 | \$335,545 | \$873,135 |
| Colorado | \$4,280,192 | \$5,147,706 | \$4,411,022 | \$13,838,920 |

Frasier: Economic Impact of Invasive Weed Species in CO; Feb 2014

Noxious Weeds Impact Recreation

Nevada Study:

Economic Impacts of Noxious Weeds on Recreation
(Most conservative numbers)

Est. Direct Impacts

| | |
|-----------------------------------|----------|
| Rec. Industry Impacts ----- | \$4.13M |
| Labor Income Impacts ----- | \$1.73M |
| Total of Economic Impacts ----- | \$5.85M |
| Employment Impacts (# Jobs) ----- | 61 - 231 |

Before



After

Eiswerth et al: Economic Impacts of Weeds; Weed Science 53:130-137, 2005

Restoration/Revegetation Projects



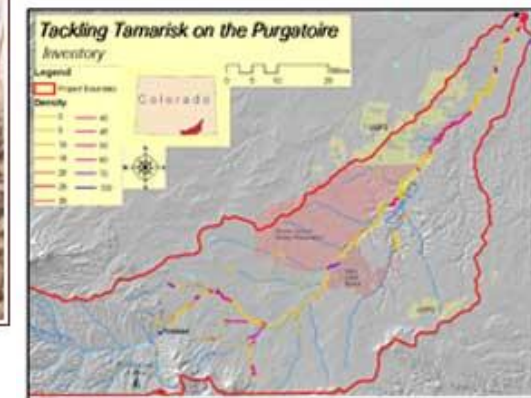
Restoration/Revegetation Projects



Restoration/Revegetation Projects



Keep Up the Good Work!



Colorado Parks and Wildlife

Resource Stewardship Program

Jeff Thompson

Jeff.Thompson@state.co.us

303-291-7156



Resource Stewardship Program

- Park Stewardship Plans
- Weed Management
- State Park Habitat Restoration
- Stewardship Volunteers
- Projects within Parks
- Possible Collaborations



Resource Stewardship Program

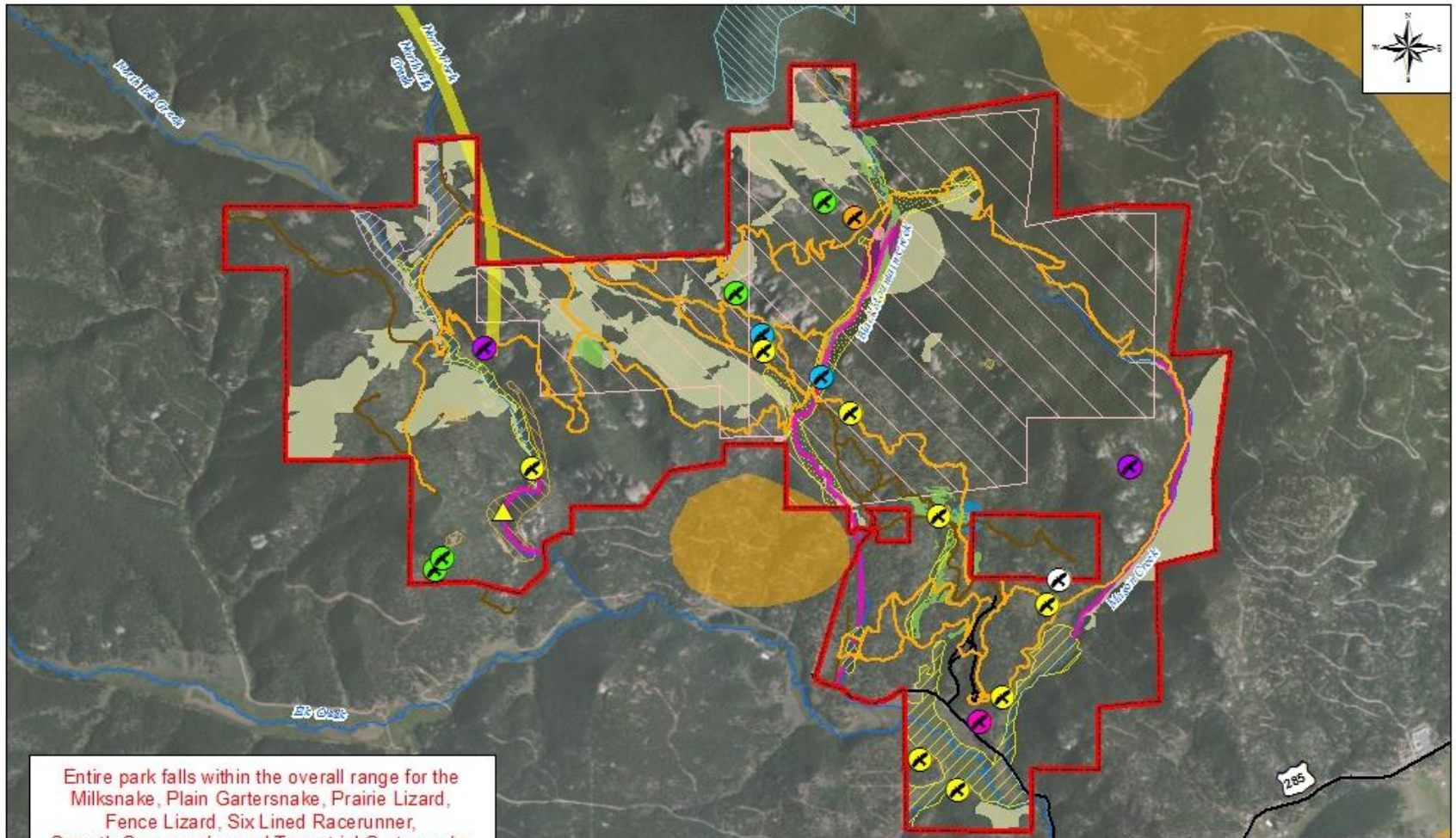
RESOURCE STEWARDSHIP PLANS



Resource Stewardship Program

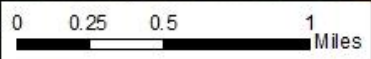
STATE PARK RESOURCE STEWARDSHIP PLANS





Entire park falls within the overall range for the Milksnake, Plain Gartersnake, Prairie Lizard, Fence Lizard, Six Lined Racrunner, Smooth Greensnake, and Terrestrial Gartersnake

Source: Earth Digital Solutions, Google Earth, United States Geological Survey, and the GIS User Community



- | | | | | |
|--------------------------|---------------------------------|------------------------|----------------------------|---|
| Park Boundary | Elk Migration Patterns | Peregrine Falcon | James' teleonix | Excellent Vegetation Condition |
| Trails | Black Bear Summer Concentration | Williamson's Sapsucker | Vasey bulrush | Northern Leopard Frog, Tiger Salamander, Western Chorus Frog |
| Public Roads | Flammulated Owl | Three-toed Woodpecker | Montane Grasslands | Foraging Habitat and Movement Corridor |
| Park Service Roads | Prairie Falcon | Virginia's Warbler | Montane Riparian Woodland | Potential Amphibian Breeding, Foraging, and Hibernation Habitat |
| Major Creeks | Olive-sided Flycatcher | Marmot Elevation Zones | Montane Wet Meadows | |
| Rural Historic Landscape | | Lynx Winter Forage | Nebraska Sedge Wet Meadows | |
| | | | Weber's monkey flower | |



Colorado State Parks

Noxious Weed Mapping and Treatment Plans

- **Currently Mapping 8-10 parks per year**
- **Goal is 4-5 year rotation for new mapping**
- **Management Plan Recommendations include:**
 - **mowing schedules**
 - **treatment priorities**
 - **opportunities for using volunteers**
 - **local partnership opportunities**

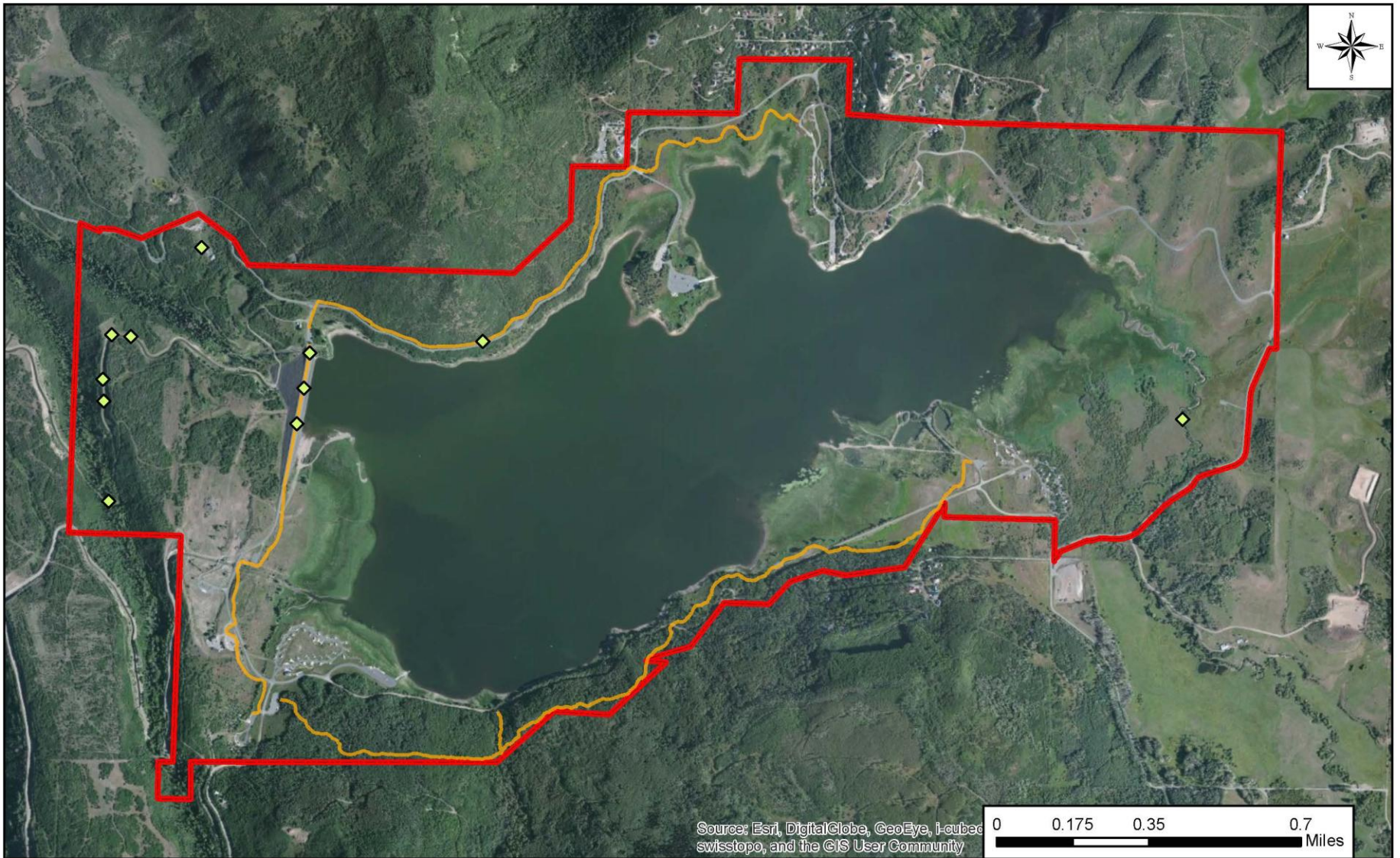


Annual/Biennial Weed Species



Vega State Park
Weed Management Plan
Early Settlers Campground
Annual/Biennial Weeds
Date: 11/13/2013
By: Marleta Sullivan

- | | | | |
|-------------------|-------------------|------------------------------------|--|
| ✕ Shepard's Purse | ● flixweed | ▲ prickly lettuce |  cheatgrass |
| ◆ bull thistle | ■ musk thistle | ☆ scotch thistle |  common mullein |
| ● cheatgrass | ◆ mustard - other | ● tarweed |  houndstongue |
| ● common mullein | ▲ pennycress | ◆ tumble mustard/ Jim Hill mustard |  musk thistle |
| ● curly dock | ● posion hemlock | ✚ yellow sweet clover | |



Vega State Park-Noxious Weeds Inventory

◆ bull thistle



Vega State Park
Weed Management Plan
Bull Thistle Locations
Date: 11/06/2013
By: Marleta Sullivan