

Integrated Weed Management Scenarios

Flagstaff

September 25, 2001

Lake Mary Road- FH3

Scene: Frequently traveled forest highway, steep slopes on either side of road, steep down-slope leading to Lake Mary. There is a paved road leading to the top of Anderson Mesa, where the mesa is open to numerous OHV roads, the Arizona Trail, Lowell Observatory, and public access to fishing and camping. Currently, at least five highly invasive exotic plants are located along each side of both paved roads. Fishermen using Lake Mary often park on roadsides and walk through populations of invasive weeds to get to the lake. Dispersed camping on Anderson Mesa and the sides of Lake Mary has the potential for spreading non-native plants. OHV use on roads and trails can spread plant parts and seeds, which jump-start new weed infestations. Hikers and horseback riders on the Arizona Trail perpetually disturb the land, creating ripe environments for the establishment and spread of invasive weeds.

From June to September, grazing cattle impact the area. The locale also supports a large elk, deer, and antelope populations, as well as waterfowl that access the small lakes in the vicinity. A rare plant (*Hedeoma difusum*) is being carefully monitored and protected on the mesa, as is the Goshawk population. Control efforts for the large populations of Mediterranean sage, diffuse knapweed, and Scotch thistle are also a priority.

In the span of three weeks in September there will be events and projects done in the Lake Mary region in regards to engineering/roads and land stewardship. These projects have separate, sometimes conflicting, agendas, which need coordination among various planning groups in order to be successful and to minimize the spread of invasive plants. Currently, herbicides are not allowed on land that is managed by the Forest Service.

Current Infestations

- Mediterranean Sage (*Salvia aethiopsis*)- Affects 450 acres on upper and lower Lake Mary, including the area adjacent to the boat ramp, and the corner of Lake Mary Road and Marshall Lake Road. Mediterranean sage is a member of the mint family and is an erect, coarse biennial or a short-lived perennial. The squarish stem and candelabra-like flowers are typical characteristics of the mint family. An adult Mediterranean sage plant can

produce up to 100,000 seeds, and it acts like a tumbleweed to disperse its potential offspring. The weed can also achieve dormancy in drought-like conditions and out-competes native plants in a wide variety of environmental settings.

- Dalmatian toadflax (*Linaria dalmatica*)- Dalmatian toadflax forms dense stands and can out-compete native plants for necessary nutrients and water. This noxious weed reproduces by seed and vegetative root buds. An adult plant can produce up to one-half million seeds as well as have lateral roots that extend ten feet from the parent plant. The root system has the ability to increase over 400% in one year, and large populations of the plant decrease biodiversity and grazing habitat for native wildlife and plant species.

- Diffuse knapweed (*Centaurea diffusa*)- This noxious weed is a dominant invader in the area, and one of the most difficult to control. Most plants of this species live to be between two and six years old and reproduce exclusively by seed. On dry rangeland, one hundred plants per acre can produce more than one million seeds. The seeds of diffuse knapweed can remain viable in the soil for at least 12 years. Diffuse knapweed is not edible to Arizona's native wildlife and an infested area can seriously restrict their habitat. The noxious weed can be found along roadsides, near trailheads, and encroaching upon undisturbed forestlands.

- Scotch thistle (*Onopordum acanthium*)- There is a patch of scotch thistle at the junction of FH3 and Marshall Lake Road. The plant can grow up to eight feet tall, and has a distinct hairiness on the leaves and stem that give the plant a gray-green appearance. Scotch thistle is a highly invasive biennial weed that has spiny leaves, vertical spines, and heavily winged stems. This thistle is exceptionally aggressive, and it forms large, single species colonies. The seeds of the weed can remain viable in the soil for 12 to 18 years. Due to the size, prolific seed production, and spiny nature of the plant, it is extremely difficult to eradicate.

- Cheatgrass (*Bromus tectorum*)- Cheatgrass is an erect winter or spring annual grass that can grow to a height of two feet. The plant has a finely divided, fibrous root system that may reach a depth of 12 inches into the soil, allowing the plant to extract most or all of the available moisture. The plant is also highly flammable, and the life cycle of cheatgrass creates a scenario for larger, more frequent fires in an ecosystem in which plants are not adapted to fire. The species completes its life cycle by early summer; the result is large areas of tinder dry plants where the potential for fire is the greatest.

Scenario I: Engineering/Roads

Coconino County plans to resurface Lake Mary Road, pull ditches, and add gravel from a pit on Forest Service land. However, a survey reveals that the pit being targeted for use is severely infested with Russian knapweed (*Acroptilon repens*) and bull thistle (*Cirsium vulgare*). The use of this pit would add two additional species of invasive weeds to an area already highly contaminated with aggressive non-native plants.

Scenario II: Lands Stewardship

Extensive habitat rehabilitation is being implemented in the Lake Mary region, with an emphasis on the protection and restoration of land. The following targets have been established as priorities for the rehabilitation efforts: 1. Enhance antelope habitat by increasing native grass cover. 2. Reduce the negative impacts caused by the cattle and elk overgrazing. A prescribed burning project will be taking place on two locations that are typically fawning and grazing areas in the summer. The first site is 80 acres and has dense diffuse knapweed and Mediterranean sage populations, estimated at nearly 35 acres of affected land, in the southern portion of the plot. The second site is 140 acres and is free from the presence of invasive weeds. The weather for the burns is forecasted to be ideal: low winds, mild temperatures, and decent fuel continuity.

SCENARIO QUESTIONS:

A.) Look at the scenario from your assigned resource perspective (engineering/roads or lands stewardship) only, and address the steps involved in the management and control of invasive weeds. What would you do for each step of the management sequence?

•**PROJECT PLANNING**

•**IMPLEMENTATION**

•**MONITORING**

Which best management practices apply?

How can you control the timing of events to make management and control most effective?

Any suggestions, additions, or changes to the best management practices?

B.) Now examine the other scenario and address only the issues of communication and coordination with your assigned resource group. When and how would your team interact the other resource team? How would you coordinate the sequence to make sure all scenarios function properly?

Scenarios for the Workshop on Integrated Weed Management Practices On The Colorado Plateau

Williams

September 27, 2001

Wildland/Urban Interface Projects

Scene: The Tusayan Ranger District is proposing to treat 800 acres to reduce fire risk in areas near private property and the Ranger Station. Treatment methods would include non-commercial thinning in most of the project, rough piling of slash in about half of the area, a small amount of chipping slash, and prescribed burning over most of the project area. Fire risk in ponderosa pine is moderate while in the pinyon/juniper stands it is rated high. In areas where many smaller trees and high fuel loadings (pine needles, cones, dead and down wood ranging from 3-7 inches deep) exist in the forest understory, a fire burning along the ground has a high potential to move up into the forest overstory and become a devastating crown fire. This thinning will encourage the reestablishment of native grasses and forbs as well as maintaining the health of older trees by reducing competition and lessening the risk of high intensity fire. A project objective is to protect private property and increase public safety.

A frequently traveled forest highway leads Grandview Lookout, where the forest is open to numerous OHV roads, and public access to hiking, horseback riding, and camping. There is also the paved US 180 leading to Grand Canyon National Park, where millions of tourists from all over the world visit. Currently, at least three highly invasive exotic plants are located along each side of hwy 180: scotch thistle, Mediterranean sage and poison hemlock. Bull thistle, Dalmatian toadflax and leafy spurge populations grow in scattered locations within the forest in the project area. Dispersed camping on the forest has the potential for spreading non-native plants. OHV use on roads and trails can spread plant parts and seeds, which jump-start new weed infestations. Hikers and horseback riders perpetually disturb the land, creating ripe environments for the establishment and spread of invasive weeds.

From June to September, grazing cattle impact the area. The locale also supports large deer and elk populations. Two rare plants, Arizona leatherflower and Tusayan flameflower grow within the project area. Tusayan flameflower grows in openings on the limestone outcrops. Arizona

leatherflower prefers shady north-facing slopes with 60-80 % overstorey cover. No surveys have been conducted within potential habitat for recent plant additions to the sensitive species list. Also goshawks inhabit the forest.

In the span of three weeks, there will be a land stewardship project, and public services event occurring in this wildland/urban interface project area as well. These projects have separate, sometimes conflicting, agendas, which need coordination among various planning groups in order to be successful and to minimize the spread of invasive plants. Currently, herbicides are not allowed on land that is managed by the Forest Service.

Current Infestations

- Bull thistle (*Cirsium vulgare*)- Bull thistle is a spiny biennial plant that reproduces solely by seed. A mature plant can produce up to 4,000 seeds, with viability in the soil lasting up to three years. Its root system consists of several primary roots and several smaller lateral roots. One of the primary roots is much longer and thicker than the others, forming a taproot. The leaves of bull thistle end in long, sharp spines. The upper surface of the leaves has short prickles, while the surface below is cottony. Flowers are purple and the flowerhead is tipped with spines.

- Dalmatian toadflax (*Linaria dalmatica*)- Dalmatian toadflax forms dense stands and can out-compete native plants for necessary nutrients and water. This noxious weed reproduces by seed and vegetative root buds. An adult plant can produce up to one-half million seeds as well as have lateral roots that extend ten feet from the parent plant. The root system has the ability to increase over 400% in one year, and large populations of the plant decrease biodiversity and grazing habitat for native wildlife and plant species.

- Poison hemlock (*Conium maculatum*)- As the common name suggests, poison hemlock is an exceedingly toxic plant, containing alkaloids that can kill humans and grazing animals. Brought to the United States as a garden ornamental, poison hemlock is now found in sizable stands of dense populations along roadsides, field margins, ditches, and low-lying waste areas. Hollow stems, umbrella-like white flowers, and a rank odor distinguish the weed.

- Scotch thistle (*Onopordum acanthium*)- This weed can grow up to eight feet tall, and has a distinct hairiness on the leaves and stem that give the plant a gray-green appearance. Scotch thistle is a highly invasive biennial weed that has spiny leaves, vertical spines, and heavily winged stems. It often forms large, single species colonies. The seeds of Scotch

thistle can remain viable in the soil for 12-18 years. Due to the size, prolific seed production, and spiny nature of the plant, it is extremely difficult to eradicate.

Mediterranean Sage (*Salvia aethiopsis*)- A medium-sized population occurs in Grand Canyon NP, immediately adjacent to the project area. Although eradication efforts have taken place within the Park, no surveys have been conducted for this species in the project area. Mediterranean sage is a member of the mint family and is an erect, coarse biennial or a short-lived perennial. The squarish stem and candelabra-like flowers are typical characteristics of the mint family. An adult Mediterranean sage plant can produce up to 100,000 seeds, and it acts like a tumbleweed to disperse its potential offspring. The weed can also achieve dormancy in drought-like conditions and out-competes native plants in a wide variety of environmental settings.

Leafy Spurge(*Euphorbia esula*) – This long-lived perennial plant reproduces both by seeds and by an extensive vegetative root system. The main roots usually extend about 8-10 feet down and 15 feet outwards in a year, but have been known to grow to nearly 30 feet deep. The seeds are forcibly ejected from the capsules and can travel up to 15 yards from the parental plant. Seeds in soil remain viable 5-8 years. Cattle develop scours and weakness while horses develop blistering and hair loss on their feet after grazing on leafy spurge.

Scenario I: Fire

The objectives of treatments would be to thin: Ponderosa pine up to 9.1” DBH; Pinyon pine up to 10.1” DBH; Juniper up to 12.1” diameter root collar (DRC). At the time of thinning, all of the activity slash would be lopped to less than two feet in height above ground. Approximately 400 acres of slash would be crushed and rough piled with a dozer where slash is heavily concentrated. Larger logs would be left as newly created dead and down woody fuels. 350 acres of relatively open stands would be broadcast burned after thinning without piling of slash. 50 acres immediately around the Ranger Station compound would not be burned.

During recent fires, Kaibab NF vehicles were loaned to the Coconino NF. Vehicles may have been driven through areas that were infested with invasive weeds: Dalmatian toadflax, scotch thistle, and bull thistle.

Scenario II: Lands Stewardship

Extensive habitat rehabilitation is being implemented for the pinyon/juniper woodland, with an emphasis on the protection and restoration of land. The following targets have been established as priorities for the rehabilitation efforts: 1. Enhance deer habitat by increasing browse. 2. Reduce the negative impacts caused by cattle and elk.

A well-established population of leafy spurge is located at Hull Cabin, fairly near the project area. A couple of outlying populations have recently been discovered within the project area.

Scenario III: Public Service

A two-day event is scheduled that will bring an estimated 300 people to the forest to view and participate in an annual mountainbike race. This year, two new small populations of poison hemlock were found near the trail set aside for the mountain bike race. In the past, designated campgrounds have been established for the event with minimal success. Many people seek out more private sites, dispersing themselves throughout the vicinity, often within areas that are infested with weeds. Lack of parking space frequently leads to vehicles being parked in random spots alongside the road, or OHV's creating their own paths into the forest. Tents with vendors and information tables will be set up, as well as three designated locations for portable toilets. There will also be an area set aside for emergency vehicles and personnel. At the conclusion of the event, independent contractors are responsible for cleaning up the area, which includes removing trash and toilets.

Scenarios for the Workshop on Integrated Weed Management Practices

Prescott/Verde Valley

October 10, 2001

Vicinity of Dead Horse Ranch State Park

Scene: Sonoran Desertscrub vegetation on white limestone hillsides, abandoned fields, campgrounds, horse trails, fishing lagoons, and Verde River. Deadhorse Ranch State Park plans to construct a new campground on the northwest part of the park between the Verde River and the hills upland. This locale was a former homestead and may have invasive and noxious weeds. New fishing lagoons are planned on the eastern side of the park, also a former farm. A system of trails leads from the park onto the Coconino NF, where the Endangered Arizona cliffrose (*Purshia subintegra*) and sensitive plants Mearns sage (*Salvia dorrii* ssp. *mearnsii*), Ripley wild buckwheat (*Eriogonum ripleyi*), littleleaf wild buckwheat (*E. ericifolium* var. *ericifolium*), and Rusby's milkwort (*Polygala rusbyi*) grow. The main trail, the Lime Kiln trail, is a Heritage route connecting Sedona with Cottonwood/Jerome. The Southwestern willow flycatcher has been reported nearby in the riparian zone of the Verde River.

Current Infestations

- Malta starthistle (*Centaurea melitensis*)- Malta starthistle, an annual or biennial plant with dandelion-yellow flowers and sharp spines, is closely related to biennial thistles and knapweeds. The weed can produce up to 100,000 seeds per plant and the seeds can persist more than ten years in the soil. The roots of this plant develop faster than native perennial grasses and can out-compete them by capturing moisture and nutrients before native plants begin to grow. Large plants can be 2.5 feet tall and have over 50 flower heads. Malta starthistle is called the “yellow starthistle of the desert” by Arizona invasive species experts because it is highly invasive. This may be throughout the area.

- Russian knapweed (*Acroptilon repens*)- Introduced to North America via shipments of contaminated hay, Russian knapweed is a deep-rooted perennial that reproduces through seed and vegetative root buds. The plant is toxic to horses, and wild grazing animals avoid the weed due to its extremely bitter taste. Flowers are urn-shaped and are pink, lavender, or white. This grows in the abandoned fields where the campground is planned.

•Salt cedar (*Tamarix ramosissima*)- Salt cedar is a deciduous shrub, or small tree, that can grow between six and thirty feet tall in the riparian zone of the Verde River. The root system of tamarisk is extensive and is largely responsible for its competitiveness and survival under stress. Seedlings mature rapidly and produce white or pinkish flowers by the end of their first year of growth. A single salt cedar plant can produce as many as 600,000 seeds per year, as well as reproduce through vegetative growth. The plant quickly depletes the water table and can radically change native fire regimes. It is important to note, however, that the endangered Southwestern willow flycatcher has been known to nest in stands of salt cedar, and control of the plant should include appropriate action for this species of bird.

•Tree of Heaven (*Ailanthus altissima*)- The tree of heaven is a deciduous tree that can grow up to 90 feet tall. Regeneration can occur from seeds or root sprouts, although trees grown from seeds occur much less frequently. The tree usually forms a single trunk with branches forming a canopy that has been described as umbrella-like. It is aggressive in nature and can grow through concrete. Control is difficult due to persistent vegetative regrowth after cutting. This species was brought in by early settlers and has become invasive in the riparian zone of the Verde River.

Scenario I: Engineering/Roads

Construction plans were drawn up several years ago for the campground and new lagoons in the park but then these projects were put on hold due to lack of funds. Now funding has become available but invasive species are a new concern both because they weren't addressed in the original project plan and because, in the interim, new infestations have been discovered adjacent to the project area and may be in the project area.

Scenario II: Lands Stewardship

Extensive habitat rehabilitation is being implemented for the region, with an emphasis on the protection and restoration of land. The following targets have been established as priorities for the rehabilitation efforts: 1. Enhance antelope habitat by increasing native grass cover. 2.Reduce the negative impacts caused by the cattle overgrazing. A prescribed burning project will be taking place at a typical fawning and grazing area. Rehabilitation by seeding of native grasses and herbs may occur. The site is 80 acres and has 10 acres of malta starthistle in it. The weather for the burns

is forecasted to be ideal: low winds, mild temperatures, and decent cloud cover.

Scenario III: Public Service

A two-day event is scheduled that will bring an estimated 200 people to the park to view and participate in a “Walk/bike or ride the Lime Kiln trail.” The event will start Deadhorse Ranch State Park and end at a ranch 15 miles east of the Park. Surveys for invasive species have not been conducted along the route. Lack of parking space frequently leads to vehicles being parked in random spots alongside roads. Tents with vendors and information tables will be set up, as well as three designated locations for portable toilets. There will also be an area set aside for emergency vehicles and personnel. At the conclusion of the event, independent contractors are responsible for cleaning up the area, which includes removing trash and toilets.