Uncompahgre Field Office
Gunnison Gorge NCA

Weed Management Strategy
Including
Strategy by Species

An abstract of management direction for species present on or threatening BLM lands

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INTRODUCTION

The successful campaign to fight an enemy requires good strategy, or long term goals to eventually wear down the opponent. This plan outlines, in general, the course of action the Uncompahgre Field Office and Gunnison Gorge National Conservation Area (GGNCA) will take in our attempt to combat noxious and other invasive weed invasions on BLM lands. There are many species of exotic plants present on or threatening lands administered by the Uncompahgre and Gunnison Gorge NCA. Some of these plants are worthy of being deemed noxious weeds either by the characteristics they exhibit in the rangeland environment, or because they are listed by the State Department of Agriculture as such. Some weeds are serious threats to rangelands, rangeland improvements, recreation areas, and wildlife habitat. This document will focus on the status of exotic plants known to exist or are threatening Uncompahgre and Gunnison Gorge BLM lands, and how we will treat these infestations through INTEGRATED WEED MANAGEMENT, including the Horsefly Coordinated Weed Management Area Plan prepared by the UP project.

The Uncompahgre and Gunnison Gorge BLM lands, encompass approximately 884,000 acres of BLM administered lands. Included in these boundaries there are 23 known noxious perennial/biennial weed species. There are a number of invasive annual weeds, for example cheatgrass (state “C” list) is significantly degrading 30% of the Land Health Assessment areas analyzed in the North Fork valley in the 2006 field season.

After inventorying approximately 60% of the Uncompahgre and Gunnison Gorge NCA the number of noxious weed infestations is approximately 2,436. These infestations equal 4,429 acres of noxious weeds, not including 1,860 miles of roads and drainages infested that pass through BLM lands. In 2004, which was considered a typical treatment year approximately 995 acres were treated for noxious weed which is approximately 22% of the known infested acreage, or approximately 11% of the known infestations. The amount of linear treatment added up to 89 miles treated which is approximately 4% of the roads/trails or drainages with known infestations. These numbers are conservative as the inventory is not complete and additional inventory is needed to locate weeds along with monitoring to ensure weeds are being treated and weed free areas are staying weed free. Our existing weed treatments are only treating a small fraction of the known infestations. With creeping perennial like Hoary cress, Oxeye daisy Russian knapweed, and Spotted knapweed spreading at rates of 8-24% a year we don’t have the luxury of not utilizing all the tools allowed in the BLM toolbox for Integrated Weed Management (IWM) and Early Detection Rapid Response (EDRR).

If there is one word that dictates the management strategy of noxious weeds it would by the word *INVASIVE*. There are many exotic weeds that are not invasive; these will see a lower priority of management. Some native plants are invasive if the ecosystem is out of balance. *The highest priority for management will focus on exotic, noxious, plants that are invasive, and pose a serious threat to public land health.* This document will be dynamic and as new plants arrive they will be added to the strategy. Also, as new management strategies emerge our management will adjust.

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CHAPTER 1

BIOLOGICAL WILDFIRE

Invasive noxious weeds have been described as a raging biological wildfire—out of control, and spreading rapidly. The impact from these alien plants is enormous: devastating economic loss to agriculture and irreparable ecological damage to wildlands. Millions of acres have been infested or are at risk (Invasive Plants Fact Book). Like wildfire, weeds do not follow jurisdictional boundaries, and private lands, public lands, rangelands, forests, wilderness areas, recreation areas.....are all affected.

The areas managed by the Uncompahgre Field Office and Gunnison Gorge NCA are no exception. Noxious weeds are found in all planning regions. While some noxious weeds have been established for some time (e.g. Russian Knapweed), previously unknown weeds are appearing at an alarming rate. Some of these invaders have permanently altered the landscape in neighboring states. The mobility of our society means the spread of noxious weeds will only increase. The Field Office must take an aggressive approach to weed management if we are to be successful.

IMPACT

Similar to an unwanted wildfire, noxious weeds can drastically affect rangeland plant and animal communities, damage watersheds, adversely impact recreation and threatened and endangered habitat, and increase soil erosion. *However*, unlike the temporary impacts of a wildfire, the ecological damage of extensive noxious weed infestations is often permanent. Lands altered by fire are self-healing over time, not so with weed invasions. Lands invaded by weeds do not return to pre-invasion conditions; weeds continue to spread and the damage worsens.

SPREAD

Like wildfires, noxious weed infestations begin small, and then expand to cover huge areas if conditions are optimal and quick control is not initiated. Weed seeds are spread by the wind, vehicles, animals, and humans which all contribute to expanding the perimeter of the infestation. These resulting “spots” grow and merge, much like the growth of a large fire.

MANAGEMENT

Prevention, Detection, Suppression (control) and **Revegetation**, are the elements of modern firefighting. The same fundamentals apply to weed management, and a balance of these elements is the key to success. The following chart is a guide to the amount of effort required for these elements (Dewey 1996):

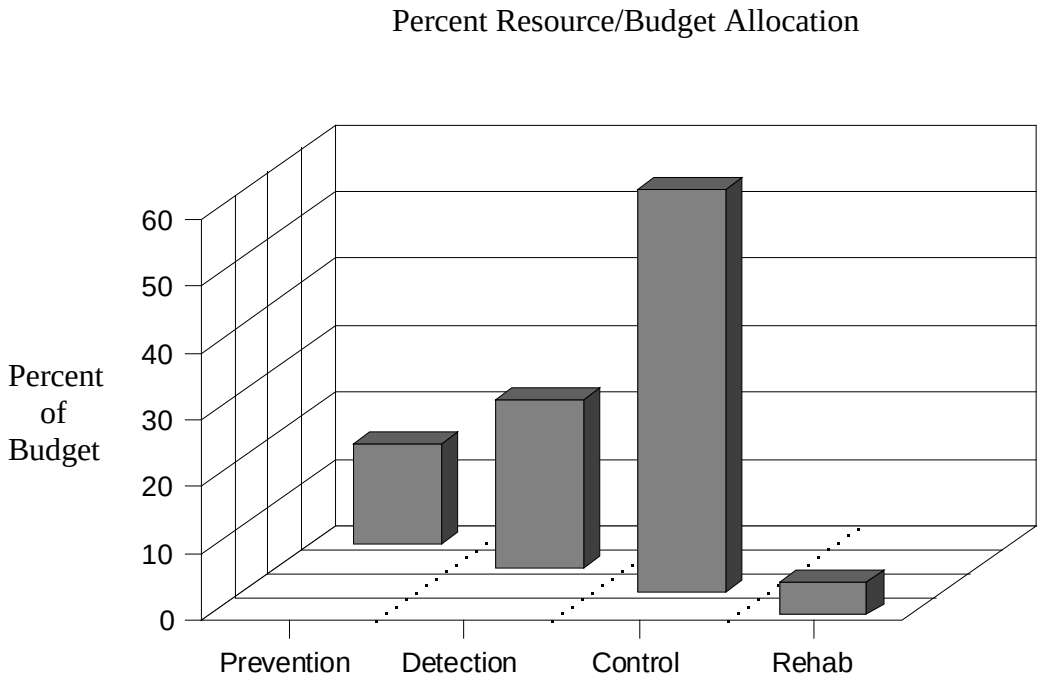

Figure 1. Percent of the total budget associated with the elements involved in Integrated Weed Management (Dewey 1996).

PREVENTION

"An ounce of prevention is worth a pound of cure" applies to both wildfire and noxious weed management. Weed prevention means placing an emphasis on preserving and protecting lands not presently infested. A balance of education and regulation are the key ingredients to raise public awareness and gain support for weed prevention. Informed hikers, bikers, hunters, OHV riders, equestrian users, grazing permitees, energy developers, and other visitors to the public lands can do much to prevent the spread of noxious weeds. Equally important are the use of stipulations to prevent introduction and establishment of noxious weeds onto BLM lands for all permitted activities. The strategic goal here is to take special precautions where land is especially vulnerable to weed infestation, especially during ground disturbing activities. The Uncompahgre and Gunnison Gorge NCA Offices manage lands for all users and the strategic goal is to educate and inform all users as well as develop our own weed management program while cooperating with other agencies in weed prevention programs. Outright prevention is best. However, once an infestation starts, catching and treating weeds while patches are small and controllable is the most cost efficient, and promotes the sustainability of ecosystems for all users, as noted in the graph below.

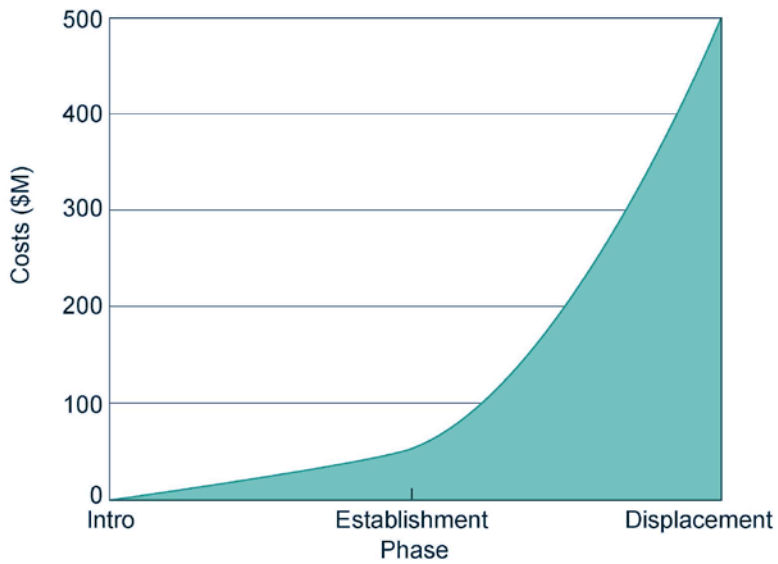

Figure 2. Management costs in million dollars and invasion phase Relationship show that prevention is the least costly phase, with exponentially rising costs once the invading weed has become established and most costly if it is displacing native species and/or disrupting native habitats (Anderson, 2000).

DETECTION

Early detection of wildfires helps make rapid and complete control a more likely outcome. The same is true for weeds. Typically in the wildfire community detection is assigned to specific individuals. But all field personnel are expected to watch for and report fires. In weed detection programs the strategy is similar: employees trained in weed identification and dedicated to weed detection are an important tool, as well as the training of all field-going personnel in weed

identification and mapping. Because of the scope of the weed problem, organizing and securing weed detection information into a useful and credible database is key to successful detection program. The strategy of the field office will be to incorporate these two levels of field detection personnel as well as the training of user groups in weed ID and mapping, together with a GIS database manager. By joining forces, we will be able to gather an accurate picture of the extent of weeds in this area and track changes through time.

CONTROL

The third element of weed and fire management is actual control. There is a definite sequence of events for the control of a fire beginning with (1) rapid response, (2) size-up of the situation, (3) containment, and (4) mop-up. Suppression efforts may fail if the proper sequence is not followed. A similar 4-step approach to weed control will increase the likelihood of success in a weed program.

Rapid Response

Controlling unwanted wildfires when small reduces costs and minimizes resource damage. The same approach is vital to new weed infestations. Often action is not taken until infestations are too large and beyond hope for eradication. *The Field Office will incorporate an early detection rapid response(EDRR) attitude toward new and small weed infestations.* Rapid response activities will in part be dictated by the Colorado Noxious Weed Act, State weed priorities, District priorities, and weeds on the Federal Species of Concern list.

Size-up

The thorough size-up of a fire is crucial. Location, size, intensity, threatened resources, limits to control efforts, and safety of personnel are all critical elements to know before management begins. Failure to gather good information to build a plan severely limits the effectiveness of an operation. The same principles apply to weed management, and it is the intent of the Field Office and GGNCA to develop an accurate assessment system for “sizing-up” a weed problem. As in multiple wildfire situations, developing a priority system is important. Some fires are worse than others, and the same is true for weeds. Knowing the priority system will aid in the tactical decisions made to manage an infestation. The Field Office will utilize data from the detection database (which typically includes GPS, hand mapping, and size-up for gathering information about weeds.) In areas covered by Weed Management Plans, priorities for control are usually enumerated and will be worked into the overall field management strategy.

Containment/Confinement

These wildfire terms define the type of tactics to use on a fire. Both terms deal with the perimeter of a fire *before* the interior of a fire. The same important concept is applicable to weed infestations. Too often weed managers concentrate on the interior of an infestation first ignoring the real threat which is the perimeter. Only after the perimeter is secure, and all “spots” outside the main perimeter controlled does work begin on the interior. Many a fire has been lost due to the unfound spot fire that later grew into a new fire. Likewise, tremendous amounts of time and money can be spent on a weed infestation only to lose it again later. Some weed infestations are small and the perimeter-to-interior process is short. Others will require more time spent before they can be called contained. In some cases a weed infestation can be confined to a geographic area using a natural barrier. This process will be an important component in the Field Office and

GGNCA battle against weeds. Along with establishing control of the perimeter, it is vital to establish control of the sources of weed transmission into an infested area. This includes weeds growing along ditch, drainage or road networks. If these are not contained first across an area targeted for weed control, reinvasion will quickly occur.

Mop-up

The final step is mop-up. For both fire fighting and weed fighting, this is the most tedious and time consuming stage. In weed management this means killing every weed within the infestation. Eradication may only be feasible on relatively small infestations. Unlike a wildfire which can be left with a few smokes on the interior, a few weeds on the interior will eventually mean more weeds again. For this reason alone, the smaller the infestation at initial attack, the more likelihood of success. In weed management, mop-up means repeated visits to the same area to ensure all are gone. The Field Office will adopt a strategy of complete and thorough mop-up in as much of the areas treated as possible, emphasizing eradication of smaller infestations and containment of larger ones ensuring no spread. Developing a system for tracking infestations, treatment history, and their current status is the goal.

Rehabilitation

The fourth fundamental of both efforts is rehabilitation. In the fire regime this sometimes is a natural event, and other times a necessary step for us as stewards of the land. Weed infestations will be the same: some areas will not need help in re-establishing viable plant communities and some will. Re-vegetation will depend on the ecological damage the infestation has done to soils, and surrounding native vegetation and will be decided using a biological team approach. Incorporated into the Field Office strategy is a checklist for determining when revegetation is necessary and will be based upon the Land Health Standards.

INTEGRATED WEED MANAGEMENT

The Field Office will adopt an integrated approach to weed management on public lands surrounding the Uncompahgre Field Area and GGNCA. Integrated Weed Management is defined as “A management system which uses all suitable methods to reduce weed populations to levels below those causing acceptable economic or ecological consequences.” Experts agree that IWM approaches are more effective than reliance on any single method. Integrated weed management must correspond with a number of variables including targeted species, time of year, climatic conditions, and soil types.

Examples of Integrated Control Techniques:

Cultural

A. Preventative regulations can help reduce the spread of noxious weeds. The weed-free hay program, maintaining parking lots, and recreation trails and facilities in weed-free conditions will aid in the prevention weed spread and are excellent examples of cultural integration of weed management.

B. Manipulation of domestic animals. Adopt a holistic approach to grazing which includes weed management. For example, timing of grazing to avoid spread of seed by grazing animals, if possible.

C. Wildlife Manipulation. Determine feasibility of changes in wildlife movement that can reduce or contain an infestation.

D. Soil Disturbance Activities. Revegetate all bare soil following a disturbance such as the construction of recreation facilities, energy developments, and range improvements. Select species that are good competitors against weeds.

E. Public Use. Determine the most feasible land use to reduce or prevent infestations. For example, consider temporary closures of areas under treatment to prevent the inadvertent spread of weed seed.

Physical

A. Manual control is determining whether hoeing or grubbing will reduce or increase the infestation. Determine whether hand pulling is practical.

B. Mechanical control involves mowing or cultivation techniques to treat infestations.

C. Prescribed Fire. In some cases controlled burning is a viable method to treat weed problems.

Biological Control

A. Natural competition is a method of biological control where naturally occurring, or planted species, compete with invading plants. Re-seeding fires to compete with downy brome is one example. Understanding the pest and the attributes of the selected species is important.

B. Biological Control Agents, such as insects, can be introduced into the ecosystem to control or maintain weed infestations. The Leafy Spurge Flea Beetle is an example of an agent used to prey on leafy spurge plants. Domestic grazing and browsing animals are considered biological control agents, and have been used effectively to control infestations.

Chemical

Chemical Control is using herbicides to control plants. The mode of action varies, some are selective to certain plants, and others are non-selective. Understanding the pest and understanding the label of a chemical are key components to an effective chemical treatment program.

AUTHORITY

The Authority for BLM to undertake integrated weed management programs is outlined in H-9015, dated 12/2/92. This manual sets forth BLM's policy relating to the management and coordination of noxious weed activities. Furthermore it is the BLM responsibility mandated by the following legislation and orders:

1. Federal Land Policy and Management Act (FLPMA) of 1976.

2. Public Rangelands Improvement Act of 1978.
3. Federal Noxious Weed Act of 1974 (as amended 1990).
4. Departmental Manual parts 609 and 517.
5. Carson-Foley Act of 1968.
6. Executive Order 11987, Exotic Organisms.
7. Pulling Together, National Strategy for Invasive Plant Management
8. Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement, June 2007

The Authority and guideline for BLM to use chemicals in the control of invasive plants is H-9011, dated 5/25/88.

Credits

Much of the material used in this strategic plan is patterned after publication AG 500, the work of Steven A. Dewey, Extension Weed Specialist at Utah State University, the combined work of many individuals in the Integrated Pest Management and Pesticide Applicator Certification course of the BLM and Mark "Sparky" Taber of the Grand Junction Field Office.

Anderson, L.W.J. 2000. Personal communication, *in* Invasive Plant Species, Council for Agriculture Science and Technology, Issue Paper Number 13. USDA-ARS, Exotic and Invasive Weed Research, University of California, Davis.

Mullin et. al., 2000. Invasive Plant Species, Council for Agriculture Science and Technology, Issue Paper Number 13.

Dewey, S.A. 1995. Noxious Weeds…A Biological Wildfire. Cooperative Extension Service, Utah State University, Logan Utah.

CHAPTER 2

GOALS, OBJECTIVES AND EXOTIC, NOXIOUS WEEDS PRESENT ON UFO/GGNCA LANDS

GOALS

- Protect and restore species diversity and the productivity of native plant communities through Integrated Weed Management.
- To expand community knowledge of the social, and economic impacts of noxious weed invasions.
- Increase community and partner involvement in the application of Integrated Weed Management, including development of weed plans, coordination of efforts across boundaries, and efficient use of resources.
- Retain a healthy ecosystem which will provide the goods and services that benefit our community now and in the future.

STRATEGIES AND OBJECTIVES

- Update and finish the comprehensive weed survey for the UFO, including mapping using GPS, in the next 5 years.
- Resurvey the GGNCA for noxious weeds in 2017.
- Monitor selected weed treatments yearly to ensure control.
- Set priorities and timing sequence for weed treatments through knowledge of weed morphology and IWM processes including Early Detection Rapid Response.
- Continue to support internal capability to treat weeds.
- Improve external resource base for treating weeds, such as establishing cooperative agreements with all counties, building reputable contractor list, and formalizing partnerships.
- Implement treatments for high priority infestations.
- Ensure that effective weed prevention measures are being taken across all BLM programs (review standard realty and mineral stipulations for weed prevention, review process for ensuring compliance, weed free hay requirements for hunter permits, weed free trail heads, etc)
- Develop weed identification classes for permittees, seasonal employees, fire staff, and the public.
- Work with GIS specialist and Ecologist so data collected is available for use office wide.

PRIORITIES

- Implement Early Detection Rapid Response for small infestations and newly invading species in UFO.
- Keep areas that are Weed Free, Weed Free through Early Detection Rapid Response.
- Treat and try to eradicate weeds along ditches, ROW's and high use areas.
- Treat and eradicate small, outlying infestations of invasive weeds.
- Work inward from the perimeter to the middle to eradicate large infestations over a series of years.
- For inaccessible or extremely large infestations pursue biological control releases.

PLANT LIST

The following list is for exotic weeds currently established on land administered by UFO/GGNCA field offices. An asterisk(*) indicates this plant is a state-listed noxious weed, either as a prohibited or restricted species and a (#) indicates this plant is a BLM national weed species of concern, plants without designation are additional problematic species that can compromise rehabilitation efforts or establish during ground disturbing activities.

Annuals:

Bur buttercup
Clasping pepperweed
Downy brome* #
Japanese brome#
Halogeton * #
Jointed goatgrass* #
Kochia
Flixweed
Redstem filaree*
Russian thistle
Yellow starthistle* #
Jim Hill Mustard
Blue Mustard
Prostrate Verbena
Annual wheatgrass
Annual ryegrass

Biennials:

Musk thistle *#
Scotch thistle * #
Diffuse knapweed*#
Common mullein*
Bull thistle * #
Hounds tongue * #
Common burdock *#

Perennials:

Canada thistle* #
Chicory*#
Curly dock*
Dalmatian toadflax* #
Yellow toadflax*#
Spotted knapweed* #
Field bindweed*#
Hoary cress*#
Purple loosestrife*#
Russian olive*#
Tamarisk*#
Leafy spurge*#
Oxeye daisy*#
Meadow knapweed*#
Chinese Clematis *#
Russian knapweed*#
Meadow knapweed*#
Absinth Wormwood *#
Horehound
Sulfur cinquefoil*#

Species of Concern on Borders:

Squarrose knapweed*#
Rush skeletonweed*#
Goats rue#
Dyer's woad*#
Perennial pepperweed*#(Grand Junction, in treatment along Colorado River)
Camelthorn*#
Black henbane*# (Grand Junction, Baxter Pass)
Silverleaf nightshade
Ripgut brome# (Grand Junction, along Bike path devils cyn area)
Garlic mustard (Ogden Utah) and Boulder Creek in Colorado (new infestation)

ABSTRACTS OF MANAGEMENT STRATEGY

Plants are categorized by life form (perennial, biennial, and annual), and are listed in alphabetical order. Not all plants have abstracts.

PERENNIAL PLANTS:

Name: Absinth wormwood, *Artemisia absinthium,* *Restricted state "B" list noxious
Non-Standard Name: American, common, or wormwood sage.
Life Cycle: Perennial **Origin:** temperate regions of Eurasia and northern Africa
Growth habit: A perennial forb or herb with a strong sage fragrance dying back to the ground every year. Plant usually grows for approximately 3ft but can grow over 5ft, leaves are spirally arranged, greenish-gray above and white below covered with silky silvery-white trichomes and bearing minute oil producing glands. Can be cultivated easily in dry soil, has allelopathic properties, and prefers soil rich in nitrogen.
Current Status: Wide spread in the Ouray and Ridgeway area. Is very prolific and spread is occurring at a rapid rate.
Management Strategy: Eradicate all infestations on BLM lands with herbicide.

Name: Canada thistle, *Cirsuim arvense,* *Restricted state "B" list noxious, BLM species of concern.
Non-Standard Name:
Life Cycle: Creeping Perennial **Origin:** Found nearly worldwide
Growth habit: Colony forming perennial from deep, extensive root system. Asexual reproduction allows male-only colonies to maintain themselves. Aggressive weed, especially on moist sites along waterways, seeps, springs, and irrigation ditches.
Current Status: Widespread across UFO at higher elevations (generally mountain shrub communities), or along streams or other wet areas. Typically in small infestations, is difficult to control and often associated with nearby irrigated ground.
Management Strategy: Try to eradicate most infestations. This could be done in combination with grazing followed by herbicide however treatment is going to be site specific.

Name: Chicory, *Cichorium intybus,* *Restricted state "C" list noxious, BLM species of concern.
Non-Standard Name:
Life Cycle: Perennial **Origin:** Mediterranean
Growth habit: Found mostly along roadsides, but has the ability to invade rangelands in higher moisture regimes.
Current Status: Occurs throughout the UFO. It is occasionally, seen along maintained roads and usually near irrigated ground. This species does not appear to be invading our native plant communities at any significant level.
Management Strategy: Monitor invasive characteristics, treat if needed using herbicide or grazing.

Name: Chinese clematis**,** *Clematis orientalis L,* *Resticted state "B" list noxious, BLM species of concern.
Non-Standard Name:
Life Cycle: Perennial **Origin:** China

Growth habit: Most *Clematis* species prefer sunny, well drained soils, although they may be shade tolerant to some degree. In Utah, Chinese clematis is found in sagebrush, mountain brush, and ruderal habitats up to 7,500 feet (Welsh et al. 1987).
Current Status: Present in the Headache 40 area north of Ridgeway.
Management Strategy: Preventing the spread of this species by eliminating seed production from established stands. Remove young plants. Herbicidal control seems to be best used at flowering.

Name: Curly Dock, *Rumex crispus*, *Restricted seed into state, BLM weed of concern
Non-Standard Name: Sour dock, Yellow dock
Life Cycle: Perennial **Origin:** Eurasia
Growth habit: Aggressive in wet meadows, along ditchbanks, and in disturbed areas.
Current Status: Possible field area wide especially around roads, spring, and seeps. This species does not appear to be invading our native plant communities at any significant level.
Management Strategy: Treat nuisance areas (pond and springs) with herbicide when necessary.

Name: Dalmation and Yellow toadflax, *Linaria genistifolia* and *Linaria vulgaris*, Prohibited state "B" list noxious, BLM species of concern
Non-Standard Name: Yellow toadflax known as Butter and Eggs.
Life Cycle: Creeping Perennial **Origin:** Eurasia
Growth habit: Aggressive plants that are a serious threat to rangelands. Extensive and deep rooted system makes this plant extremely difficult to control. Really aggressive with 15-20" of precipitation.
Current Status: Known infestation in the Colona LHA, along the Upper Gunnison River near Duncan campsites, probable along North Fork of the Gunnison and likely to be spreading through upper elevations of the North Fork in isolated spots. An isolated Dalmation toadflax plant has been documented along Carpenter Ridge road north of Paradox Valley, indicating more may be in the area.
Management Strategy: Map infestations of both species, eradicate Carpenter Ridge infestation with herbicide if possible and monitor area for additional infestations. Yellow toadflax continue treating with herbicide and monitor for additional infestations. Work with counties and other outreach groups for public education and coordinate with the Uncompahgre Plateau for private land treatments.

Name: Field bindweed, *Convolvulus arvensi*, Prohibited state "C" list noxious weed, BLM species of concern
Non-Standard Name: Creeping jenny, Morning glory, Perennial morning glory
Life Cycle: Perennial **Origin:** Europe
Growth habit: Remarkable adaptability enables plant to grow under many conditions, including to elevations of 10,000 ft. Deep taproot giving rise to numerous lateral shoots make this plant difficult to control and seeds remain viable for up to 50 years.
Current Status: Widespread in cultivated fields and orchards across the UFO area. The plant is mostly confined to maintained roadsides through BLM, although it has spread into disturbed areas like the Wake Fire.
Management Strategy: Attempt to determine extent of it on BLM lands. Eradicate infestations found when feasible with herbicide or when appropriate use biological control (bindweed mite).

Name: Hoary cress, *Cardaria draba*, Prohibited state "B" list noxious weed, BLM species of concern
Non-Standard Name: Whitetop

Life Cycle: Creeping Perennial **Origin:** Europe
Growth habit: Highly competitive and invasive. Well adapted to alkaline soils. Growth and maturity occur in early spring around the valley and surrounding BLM lands.
Current Status: Plant appears to have reached a critical mass and is widespread throughout private lands in the valley and in the Northfork and Nucla area. Found in isolated patches on the Uncompahgre Plateau. Treatable with herbicides, but extremely difficult to control once established in especially in steep mountain shrub communities. There is some in the Northfork area and the Wake Fire that is small in size and would respond well to herbicide treatment and should be a treatment priority! Will invade healthy rangelands and out compete native vegetation.
Management Strategy: Eradicate all new infestations, especially in remote areas. Attempt to control along all road sides especially in and around the NCA and eradicate all patches or isolates in wilderness areas. Work on treatment off roads and push weed to road sides where treatment is more accessible. Treatment will be with herbicide.

Name: Leafy spurge, *Euphorbia esula*, Prohibited state "B" list noxious weed, BLM species of concern
Non-Standard Name:
Life Cycle: Creeping Perennial **Origin:** Eurasia
Growth habit: Stems are thickly clustered. Flowers are yellowish-green, arranged in numerous small clusters and subtended by paired heart-shaped yellow green bracts. Roots are brown with pink adventitious buds which may produce more shoots or roots. The entire plant contains a milky juice with cause's severe irritation of the mouth and digestive track of wildlife and many livestock. It has the capability to reduce livestock and wildlife carrying capacity by 50-75%. Cattle will not graze an area infested with even 10-20% leafy spurge cover. In the United States, direct livestock production losses combined with indirect economic effects due to this species alone approached $100 million in 1990.
Current Status: Known infestations in the North Fork area near Minnesota Creek outside of Paonia, and in the Colona area near Ridgway in the vicinity of Girl Scout Camp.
Management Strategy: Inventory and attempt eradication of all new and existing BLM infestation using a combination of herbicide, grazing + herbicide, and biological. Monitor areas of BLM where it is known to exist on adjacent private. Care should be taken around this weed the milky sap contains latex and can cause blistering, rash and eye irritation in people susceptible. PPE should be worn to handle plant.

Name: Meadow knapweed, *Centaurea pratensis*, Prohibited state "A" list noxious weed, BLM species of concern
Non-Standard Name:
Life Cycle: Perennial **Origin:** Europe
Growth habit: It is a hybrid between brown knapweed and black knapweed and is fully fertile. It invades moist sites including meadows, riparian areas, irrigation ditches and openings in forested areas and is associate with areas oxeye daisy would be present. Does not tolerate shade. It primary reproduction is by seed but will sprout by the roots and crown of the plant.
Current Status: Possible small infestation in the Colona area.
Management Strategy: Inventory the area during LHA and dig out if small enough infestation. Roots must be cut at least 8" below crown and plants must be bagged and hauled out. If infestation is too large herbicide application will be necessary to start the eradication process then monitoring and digging of any seedlings.

Name: Oxeye daisy, *Chrysanthemum leucanthemum*, Prohibited state "B" list noxious weed, BLM weed of concern
Non-Standard Name:
Life Cycle: Creeping Perennial **Origin:** Eurasia
Growth habit: Erect rhizomatous perennial, leaves progressively reduce in size upward on the stem. It inhabits meadows, roadsides, and waste areas. Flowers from June through August.
Current Status: Widespread around mountain towns and moving downstream along riparian corridors. Along San Miguel River to Pinyon, in the Colona area around Billy Creek, scattered plants in riparian areas on the Uncompahgre Plateau and in the North Fork area, especially along roadsides, North Fork of the Gunnison River and its tributaries. The greatest impact of oxeye daisy is on forage production of infested pastures and meadows. Cattle and wildlife avoid oxeye daisy and therefore any pasture infested with dense stands of oxeye daisy will decrease forage available for grazing of domestic livestock and wildlife. Dense stands of oxeye daisy can decrease plant diversity and increase the amount of bare soil in an area. The full extent of ecological, environmental, economical and sociological impacts are not well documented.
Management Strategy: Can apply high density grazing (by goats) followed by herbicide to gain control and eradicate. Most treatment will be with herbicide. Must think long term the plant is a prolific seed producer with a robust plant producing up to 26,000 seeds/yr which are viable up to 6 years with a few viable up to 39 years. No biological controls available.

Name: Perennial pepperweed, Prohibited state "B" list noxious weed, BLM weed of concern.
Non-Standard Name: Tall whitetop
Life Cycle: Perennial **Origin:** SE Europe and SW Asia
Growth habit: Has the ability to invade and establish in a wide range of habitats. Most often found in riparian areas, irrigation canals and areas where the water table is higher.
Current Status: Located along the Colorado River. Some could be along the Gunnison River and other river corridors. Need to inventory waterways for this plant.
Management Strategy: Eradicate where possible, contain and treat large infestations with herbicide. Junction has had good success treating this plant when caught early and infestations are small.

Name: Purple loosestrife, *Lythrum salicaria*, Prohibited state "A" list noxious weed, BLM weed of concern
Non-Standard Name: Purple lythrum
Life Cycle: Perennial **Origin:** Eurasia
Growth habit: Escaped ornamental that invades aquatic sites such as streambanks, springs, seeps, or shorelines of ponds.
Current Status: Long estabilished population in Nucla area, Redvale and drainages down to San Miguel River. Has been seen in Montrose along ditchbanks. Possible isolated single plants along the Gunnison River from the forks to the Delta Bridge.
Management Strategy: Eradicate all infestations, either with herbicide treatments, or biological control if patch has gone outside economical treatment. Institute yearly scouting and hand pulling if patch is less than 10 plants.

Name: Russian knapweed, *Centaurea repens*, Prohibited state "B" list noxious, BLM weed of concern
Non-Standard Name:
Life Cycle: Perennial **Origin:** Mongolia, W. Turkestan, Iran, Turkish Armenia
Growth habit: Infests roadsides, pastures, disturbed sites, orchards. Allelopathic properties of this plant exclude other vegetation from growing. On BLM lands this plant seem to the most

aggressive in riparian areas, including irrigation ditch banks and is less aggressive in open rangeland. Has the ability to form monocultures over long periods of time.
Current Status: Found area-wide on BLM lands. Found along roadsides, and other disturbed or wetter areas. Extensive infestations (near monocultures) along Gunnison river below the Cedaredge bridge and along the lower Dolores River, etc.
Management Strategy: Eradicate all infestations in WA and in the potato plantation area acquired by BLM. Continue eradication of small infestation along roads, ponds, boat ramps, camp sites, high traffic areas, seeps and springs. Complete removal of this weed from BLM is unlikely, given the scope of infestations of public and private land. Overall goal is to slowly reduce the current amount of R. knapweed, and not have anymore that exists in aggregate. Hope for biological control tests are underway and hopeful for larger releases in next two years. Herbicide works well in the fall until frost and spring before flowering. Most treatment will be with herbicide as this plant can cause severe allergic reactions for susceptible persons.

Name: Russian olive, *Eleagnus angustifolia*, Prohibited state "B" list noxious, BLM weed of concern
Non-Standard Name:
Life Cycle: Perennial tree **Origin:** Europe
Growth habit: Introduced as an ornamental shade tree, with wildlife food and habitat benefits. This tree does invade pastures, meadows, and riparian areas. It can be a serious weed problem as it negatively affects native cottonwood galleries.
Current Status: Found sporadically along main river courses, small streams, and irrigation ditches. Seldom found in open rangeland.
Management Strategy: Work on eradication along waterways in the wilderness areas, NCA as priorities then along the main water ways in the field area. Treatment will be with herbicide, either using cut stump method or jab stick.

Name: Spotted knapweed, *Centaurea maculosa*, Prohibited state "B" list noxious, BLM weed of concern
Non-Standard Name:
Life Cycle: Biennial or short-lived perennial **Origin:** E. Europe
Growth habit: Basal leaves of the plant grow up to 6" long and are entire to pinnately parted, stem leaves are pinnately divided. Bracts have a distinctive dark spot distinguishing it from diffuse along with a pink to purple flower. Diffuse and spotted are often found growing together in the same habitats. Seed disseminate in the fall and readily germinate in the spring. Some seeds can be viable for up to 8 years in the soil, so monitoring of site after control is essential in maintaining control. It does not tolerate total shading well and this will help to reduce spread in a closed canopy site. Has ability to invade healthy rangelands and out compete native species.
Current Status: Along Highway 90 and the Rim Road there is a patch that has spread to approximately 600 acres. Some contract treatment has been done, but lack of funding has not allowed for contracts every year. This is a patch that needs to be treated every year until contained and controlled, then monitoring and spot spraying with BLM crews to maintain. Present in large infestations on the Forest Service, to include the powerline and pipeline ROWs in the Horsefly area of the Forest Service. It is also known on BLM at Ledges campsite, at Beaver Creek crossing along the Beef Trail outside of Norwood and in the Fruitland Mesa area.
Management Strategy: Mandated by the state to eradicate all patches and not let go to seed. Treatment is by herbicide for large infestation. Small isolated spots can be hand dug making sure to get the root and the plant would be bagged and properly disposed of.

Name: Tamarisk , *Tamarisk spp,* Prohibited state "B" list noxious, BLM weed of concern, H.R. 2720 signed 12, Oct.2006 is for the eradication of Tamarisk.
Non-Standard Name: Saltcedar, Tamarik
Life Cycle: Perennial shrub or tree **Origin:** E. Mediterranean, S. Europe
Growth habit: Escaped ornamentals that have gained a foothold over much of the United States. Readily invades riparian areas, ephemeral drainages, and water developments. Salt accumulation extruded from the leaves onto the soil gives allelopathic properties pushing out and limiting germination of native vegetation.
Current Status: Found area-wide on BLM lands. It is beginning to show in higher elevations of Colorado.
Management Strategy: Will use biological control where feasible, and have worked with Dan Bean at Palisade Insectory for two biological releases along the Gunnison and San Miguel Rivers. Other treatments with mechanical or manual removal will occur in high value areas i.e. recreation areas, and high value riparian area. The office needs to contemplate what to do with standing dead tamarisk after defoliation with biological control agents. These dead trees in riparian areas increase the fuel loading and can carry a riparian fire into areas of concern (healthy cottonwood/riparian areas).

BIENNIAL PLANTS

Name: Common burdock, *Arctium minus *Restricted on state "C" list noxious weed*
Non-Standard Name:
Life Cycle: Biennial **Origin:** Europe
Growth habit: Readily establishes near water sources and degraded rangeland in moisture collecting areas. Burs a nuisance for domestic pets and livestock especially sheep where it will reduce the quality of wool.
Current Status: Found varying levels area-wide.
Management Strategy: May have to use herbicides to contain very large infestations. Eradicate small isolated patches. Rosettes can be dug with shovel when small. Treat areas where livestock are affected. Keep un-infested areas free of burdock. Try to keep out of wilderness and wilderness study areas.

Name: Common mullien, *Verbascum thapsus* *Restricted on state "C" list noxious weed
Non-Standard Name: Flannel mullien
Life Cycle: Biennial **Origin:** Asia
Growth habit: Occupies open rangeland, more when area is disturbed or in marginal condition. Numerous seeds make it difficult to control.
Current Status: Varying degrees throughout the field area.
Management Strategy: Treat with herbicide or dig out rosettes when nuisance levels are no longer tolerable. Not known whether plant forms near monocultures. Not palatable to livestock or wildlife. Maybe beneficial for butterflies and pollinators.

Name: Bull Thistle, *Cirsium vulgare* *Restricted state "B" list noxious weed, BLM weed of concern
Non-Standard Name:
Life Cycle: Biennial **Origin:** Eurasia
Growth habit: Aggressive rangeland weed, especially in higher moisture regimes. Readily occupies highly disturbed sites such as gas pads, campsites, rights-of-ways, wildfires, etc.
Current Status: Found area wide although, no monocultures known to exist.

Management Strategy: Eradicate all infestation possible. Can be treated with herbicide at the same time as Whitetop, Hounds tongue, and Burdock or can dig rosettes when feasible.

Name: Diffuse knapweed, *Centurea diffusa*, *Prohibited state "B" list noxious weed, BLM weed of Concern.
Non-Standard Name: Tumble knapweed, White knapweed
Life Cycle: Biennial **Origin:** Europe/Eurasia
Growth habit: Diffuse knapweed often portrays a rosette form for one year, reaching maximum size, then rapidly growing and flowering during the second year. A single plant can produce approximately 18,000 seeds/yr. Areas in which diffuse knapweed has been readily established are plains, rangelands, and forests. Land that has been recently disturbed—by human or natural processes—is favored for the establishment of diffuse knapweed. It grows in semi-arid and arid environments and seems to favor light, dry, porous soils. Areas with large amounts of shade or high levels of water discourage diffuse knapweed growth**.**
Current Status: The field office has several relatively small infestations of this species. One is located off Buckhorn rd, one in the Ouray area, and an area off Shinn Park area.
Management Strategy: Mandated by the state to eradicate all patches and not let go to seed. Treatment is by herbicide for large infestation. Very small isolated spots can be hand dug making sure to get the root, the plant would be bagged and properly disposed of.

Name: Houndstongue, *Cynoglossum officinale*, *Prohibited state "B" list noxious weed, BLM weed of Concern
Non-Standard Name:
Life Cycle: Biennial **Origin:** Europe
Growth habit: Readily invades moist areas and areas of higher precipitation regardless of condition, will thrive in disturbed sites such as gas pads, camp sites, bed grounds etc.
Current Status: Known to be established in the Colona, North Fork, and Uncompahgre Plateau areas, primarily in mountain shrub and riparian areas. This plant occurs in isolated patches throughout the field office area. Highly toxic to wildlife, livestock and people if consumed, causing liver cells to stop reproducing, lag time to death could be six months.
Management Strategy: To eradicate small infestations, and new infestations. Treatment will be with herbicide and trying to graze areas when seed is not present. Biological controls have already been released in Canada, however these may not be considered in the US due to cross over onto native borages. Can dig rosettes when infestation is small and digging is feasible. Roots must be cut at least 4 inches below rosette.

Name: Musk thistle, *Carduus nutans* * Prohibited state"B" list noxious weed, BLM weed of concern
Non-Standard Name: Nodding thistle
Life Cycle: Biennial **Origin:** Europe, W. Asia
Growth habit: Aggressive invader of range and forest land, roadsides, ditchbanks, disturbed areas. Rapid spread forms dense monocultures. Thrives in higher regimes, but will grow small plants in drier sites.
Current Status: Present throughout field office area. Large, problematic infestations known from Bostwick Park and in the Burn Canyon Fire. North Fork higher elevation areas would also be likely for large infestations along with higher elevation in the Colona area. Other spotty infestations probable throughout the field area, especially along irrigation ditches and wetter areas.

Management Strategy: Contain infestation when found. Small infestations could be treated using a shovel to cut the taproot, while other larger infestation will need to be treated with herbicide or a biological. When cutting the rosette the tap root need to be cut 4 inches below the top of the rosette.

Name: Scotch Thistle, *Onopordum acanthium* and *Onopordum tauricum* * Prohibited state "B" list noxious weed, BLM weed of concern
Non-Standard Name: Cotton thistle
Life Cycle: Biennial **Origin:** Europe, E. Asia
Growth habit: Aggressive plant can grow up to 12 feet. First year plant grow enormous rosette. If allowed, forms dense monocultures impenetrable by livestock. Thrives in higher moisture regimes, but will grow small plants in drier sites.
Current Status: Present in North Fork area around coal mines and in the Cedaredge area along ROWs. This plant is also seen along irrigation ditches, perennial streams, or river corridors throughout the field area.
Management Strategy: Eradicate small infestations when located. Control can be done with a shovel at least 8" down on the root or herbicide on small infestation.

<u>Annual Plants</u>

Name: Annual wheatgrass, *Eremopyrum triticeum*
Non-Standard Name: Annual wheatgrass
Life Cycle: Winter annual **Origin:** Central and Western Asia
Growth habit: Annual wheatgrass is found in the lower margins of the big sagebrush zone, arid shrub steppe and salt desert environments. It is a highly undesirable weed.
Current Status: Spotty throughout the field office and GGNCA.
Management Strategy: Cultural maintenance (i.e. fire rehabilitation) in areas that would be susceptible to invasion. Good grazing management to support native plant communities. Eradicate where problematic to restore areas, possibly using an herbicide application depending upon size of infestation.

Name: Blue mustard, *Chorispora tenella*
Non-Standard Name: Purple mustard, Tenella mustard
Life Cycle: Annual **Origin:** SW Asia
Growth habit: Competitive, especially after soil disturbance or fire in desert areas. This species establishes easily in semi-deserts, foothills, woodlands, and agricultural fields. It can form a dense mat making seed establishment of desirable species difficult.
Current Status: Total status unknown. Frequent in the field office boundaries.
Management Strategy: Cultural maintenance (i.e. fire rehabilitation) in areas that would be susceptible to invasion. Good grazing management to support native plant communities. Eradicate where problematic to restore areas, possibly using an herbicide application depending upon size of infestation.

Name: Bur buttercup, *Ranunculus testiculatus*
Non-Standard Name: Little bur and testiculate buttercup
Life Cycle: Annual **Origin:** SE Europe
Growth habit: Competitive, especially after soil disturbance or fire in desert areas. This species can form a dense mat making seed establishment of desirable species difficult.
Current Status: Total status unknown. Frequent in the field office boundaries.

Management Strategy: Cultural maintenance (i.e. fire rehabilitation) in areas that would be susceptible to invasion. Good grazing management to support native plant communities. Eradicate where problematic to restore areas, possibly using an herbicide application depending upon size of infestation.

Name: Clasping pepperweed, *Lepiduim perfoliatum*
Non-Standard Name:
Life Cycle: Winter annual or annual **Origin:** Europe
Growth habit: Not highly competitive, but establishes after disturbances such as fire. Occasional plants found in open rangeland settings, particularly on disturbed soils at lowest elevations.
Current Status: Found in many areas of the field office, mostly on clayey or adobe sites.
Management Strategy: Monitor for unusual infestations. Treat with herbicide if necessary.

Name: Downy brome, *Bromus tectorum,* State weed list "C", BLM weed of concern
Non-Standard Name: Cheatgrass
Life Cycle: winter annual **Origin:** Europe, N. Africa, Middle East, and Asia
Growth habit: Invasive following disturbance or poor management. Lower elevations are more susceptible.
Current Status: Found in many areas of the field office, with lower elevations and Pinyon/Juniper and sagebrush areas containing the most.
Management Strategy: Can be reduced by cultural practices such as fire rehabilitation (including seeding with competitive species), careful timing and design of vegetation treatments to avoid increasing cheatgrass, sound grazing management, and small-scale restoration of disturbed sites, such as trailheads, and boat ramp areas. Some projects targeting cheatgrass are possible to restore native plant communities. Use of the herbicide Imazapic where appropriate for fire stabilization and land health treatments when needed. Research into biological control underway, stay informed on developments.

Name: Flixweed, *Descurainia sophia*
Non-Standard Name: tansy mustard
Life Cycle: winter annual **Origin:** Europe
Growth habit: Occupies disturbed areas, roadsides, agricultural areas, may come into burned areas at lower elevations.
Current Status: Found in isolated disturbances. This plant does not appear to be highly competitive in healthy rangelands.
Management Strategy: May be necessary to control through cultural practices such as fire rehabilitation and good grazing practices.

Name: Hologeton, *Halogeton glomeratus* *Prohibited state "C" list noxious weed, BLM weed of concern
Non-Standard Name:
Life Cycle: Annual **Origin:** Asia
Growth habit: Not highly competitive, but readily invades disturbed or over-grazed lands. It is ideally adapted to alkaline soils and semi-arid environments of the high-desert. Unpalatable and very toxic to sheep at all stages of growth.
Current Status: Halogeton has been in the field area for many years and is present especially in lower area, on adobe soils or other fine grained soils.
Management Strategy: Contain using herbicide treatment on new disturbances (i.e. pipelines, roads etc.) Reseed disturbances with competitive species.

Name: Japanese brome, *Bromus japonicus,* BLM weed of concern
Non-Standard Name:
Life Cycle: annual, winter annual **Origin:** European introduction
Growth habit: More of a nuisance in depleted rangelands. It is often confused with downy brome (cheatgrass). Will invade disturbed sites such as pipelines, and recently disturbed areas seen in areas with cheatgrass.
Current Status: Seen within the field area, Total infestation not known, sizeable patches (10s-100s of acres) in Crawford, and Cederedge areas.
Management Strategy: Same as cheatgrass**,** can be reduced by cultural practices such as fire stabilization, sound grazing management, and small-scale restoration of disturbed sites, such as trailheads, and boat ramp areas. Some projects to remove and restore native plant communities possible with herbicide either Imazapic or Glyphosate.

Name: Jim Hill Mustard, *Sisymbruim altissimum*
Non-Standard Name: tumble mustard, tall tumble mustard
Life Cycle: annual **Origin:** Eurasia
Growth habit: Waste ground, disturbed ground, follows fire as early succession species
Current Status: Wide spread throughout the field office. Not a problem in most areas.
Management Strategy: To rehabilitate disturbed areas especially wildland fires and prescribed burns. Use good grazing practices and best management practices for ground disturbing projects. Can hand pull if infestation is small enough if not herbicide may be used.

Name: Jointed goatgrass, *Aegilops cylindrical* *Prohibited State "C" list noxious weed, BLM weed of Concern
Non-Standard Name: Jointgrass
Life Cycle: winter annual **Origin:** S. Europe
Growth habit: Growth habitat is usually along newly disturbed areas especially roadways and areas associated with agricultural practices especially wheat farming. This grass seems to be invasive in Grand Junction with it pushing out cheatgrass in areas.
Current Status: This field office has some infestation but they are believed to be spotty. Substantial infestations have been observed along roadsides in Peach Valley area, Naturita Creek, and the North Fork.
Management Strategy: This grass is highly competitive with disturbance and continued screenings along roads, agricultural areas, and new disturbances should be made. Effective treatments include pulling before seed is mature on small infestation with follow up visits to the area, grazing in the spring if done at the appropriate levels not to hamper perennials and application of herbicide treatments when area is too big for hand pulling.

Name: Kochia, *Kochia scoparia*
Non-Standard Name: Kochia, fireweed, burning bush, summer cypress
Life Cycle: annual **Origin:** Eurasia
Growth habit: Kochia is seen on dry pastures, rangeland, and areas with alkaline soils. It readily establishes following fire and ground disturbances. Does not establish in areas with very high acid soils. Is cultivated as a forage crop and is used in fire rehabilitation areas in the Great basin to add a fuel break in marginal areas dominated by cheatgrass.
Current Status: Throughout the field office and GGNCA infestations are usually small and spotty. Species is usually not a problem.
Management Strategy: To rehabilitate disturbed areas especially wildland fires and prescribed burns. Use good grazing practices and best management practices for ground disturbing projects.

Can hand pull if infestation is small enough, can graze the patch if done at appropriate time, if not herbicide may be used.

Name: Redstem filaree, *Erodium cicutarium*
Non-Standard Name: storksbill, filaree
Life Cycle: winter annual **Origin:** Eurasia
Growth habit: This species is adapted to a broad range of soil types and is found in oak woodlands, semi-desert grasslands, and desert shrublands.
Current Status: It occurs sporadically throughout the field office and GGNCA. It is normally not a problem unless established in the wake of ground disturbing activities.
Management Strategy: To control when necessary by hand pulling, grazing or herbicide.
Name: Russian thistle, *Salsola tragus* ***or*** *Salsola iberica*
Non-Standard Name: Russian thistle, tumbleweed
Life Cycle: winter annual **Origin:**
Growth habit: This species is found in fields, roadsides, waste places, and disturbed sites. It does best on high, dry land if other plants are not crowding it. It is quite drought resistant.
Current Status: It occurs sporadically throughout the field office and GGNCA. It is normally not a problem unless established in the wake of ground disturbing activities.
Management Strategy: To control when necessary by hand pulling, grazing or herbicide.

Name: Yellow starthistle, *Centaurea solstitalus* *Prohibited state "A" list noxious weed, BLM weed of Concern
Non-Standard Name: St. Barnaby's thistle, golden starthistle or yellow cockspur
Life Cycle: Winter Annual **Origin:** S. Europe, W. Eurasia
Growth habit: Extremely aggressive once established. Numerous small seeds scattered by wind and other means, usually introduced on roadsides. UFO/GGNCA highly susceptible to invasion.
Current Status: Major patch in Montrose/Ouray county on private but has crossed over onto BLM. An isolated infestation was found in 2009 in the west end of Mesa County, UFO Field Office. Large 100+ acre infestation on private land in the Paonia area, it has crossed onto BLM. The office will be working with all County Weed Coordinator s to map infestations and treat with herbicide as necessary.
Management Strategy: This species is mandated by the state to eradicate all new infestations with either hand pulling or herbicide. Continue scouting adjacent to and downwind of known infestations. Early detection and treatment are vital.

CHAPTER 3

Safety and Storage of Equipment and Herbicides

Toxicity of Herbicides

How toxic are herbicides?

- All herbicides are toxic, ***whether they are dangerous depends on the dose!***
- The measure of toxicity is in milligrams per kilogram mg/kg body weight, therefore the smaller the number the more toxic the herbicide.
- Relative toxicities are measured using a measure called LD-50, which is the dose of the *ACTIVE INGREDIENT* of herbicide being tested that will kill 50% of the test animals, which is measured on mg/kg of body weight.

As herbicides available have only a fraction of the active ingredient when they are sold as a *commercially available herbicide*, the toxicity of a commercially available product is much less than the stated toxicity of the active ingredient.

Then commercially available herbicides are diluted even more with water and a surfactant is added before application!!! The LD-50 is even lowered again. The table below shows some relative toxicity of herbicides as compared with other common products, **before dilution for application**. *Remember the lower the number the higher the toxicity, so **Nicotine** is 86 times more toxic than **Glyphosate**!!* Table is in order of toxicity.

Substance	**Use**	**Oral LD-50**
Nicotine	Tobacco	50
Caffeine	Coffee beans	150
2, 4-D amine	Herbicide	300
Garlon	Herbicide	713
Penicillin	Antibiotic	1000
Banvel	Herbicide	>2000
Table salt	Condiment	3300
Glyphosate	Herbicide	4300

Figure 3. Queensland Government, Department of Industries and Fisheries.

<u>Safety for Application of Herbicides and Disposal of Empty Containers</u>

- Since studies have shown that 90% of herbicides get into the body through the skin, simple precautions such as wearing the appropriate PPE (coverall, gloves, safety glasses, rubber boots) will reduce the intake of the product considerably (Department of Primary Industries and Fisheries, Queensland Australia). Grand Junction and Meeker are examples of an excellent safety program with herbicides. NO INCIDENTS!
- All individuals applying herbicides will receive training on safety and application procedures prior to application.
- A copy of MSDS sheets for all herbicides will be available at all times. Employees will be briefed and familiar with the information in these documents in the case of an event or spill.

- PPE will be worn at all times when herbicides are being mixed and applied. All label requirements will be followed, note minimum requirements for BLM personnel below.
- An emergency spill kit, with directions for use, will be present when herbicides are being mixed, and transported. Employees will be briefed on the use of the spill kit prior to initiation of operations. Kit will include: shovel, broom, absorbent material, large plastic bags and nitrile gloves.
- All containers will be triple rinsed, holed, and disposed of in the dumpster.
- All sprayers will be triple rinse between uses (herbicide).
- All rinsing of sprayers will be done in the field, and all sprayers will be stored cleaned.

Minimum Requirements for BLM Personnel, regardless if the label requirements are less.

Minimum PPE Requirements for BLM Personnel				
	Aerial contract (Admin)	**Loading**	**Mixing**	**Application**
Coveralls	Required	Required	Required	Required
Gloves		Required	Required	Required
Goggles			Required	Required
Boots			Required	Required
Headgear			Required	Required

Queensland Government. 2004. How Toxic are Herbicides on your Property. Department of Primary Industires and Fisheries.

Storage of Herbicides

Storage will be in accordance with federal and state regulations.

- Two self closing herbicide cabinets with locks.
- Herbicide log out sheet: who, what herbicide, amount taken, target species, and where applied. These sheets are then turned into the Weed Coordinator along with the pesticide application record to help maintain accurate records.
- Spill kit and directions on how to use it if needed will be stationed by the cabinets.

CHAPTER 4

Cost of Doing Business

The cost figures for this document are from consultation with various weed managers in western Colorado (Meeker, Grand Junction). The figures represented here are approximately ½ of the cost to contract all control applications. Some of these figures are on time and will not be needed again for some time.

The weed treatment season is similar to the prescribed fire season *because the window tends to be fairly short and varies by species.* Application contractors are few, there are a limited number of county personnel, and both are spread out over several jurisdictions for a relatively short window of application. Timing has not always been best for applications. Weather plays an important role, with the effectiveness of herbicides limited to certain weather conditions. Most spraying is done early in the day before winds are too strong.

The BLM has a national policy" Pulling Together" which emphasizes "Early Detection Rapid Response" through three national goals, Effective Prevention/Detection, Effective Control, and Effective Restoration. We need to be able to respond quickly to infestation without having to go through the long process of developing and awarding a contract or depending on the county for weeds spreading off county roads into rangeland or spraying small patches of weeds off county roads dissecting BLM. Too often when the pre-work is done and a contract awarded, the window is closed or the contractor has other obligations…and the weeds go untreated. We on the other hand could be in and out on small infestations with a high probability of success of stopping the spread of weeds before they become large ecological wildfires.

This integrated approach will still support the counties on spraying county road ways through BLM and certain BLM roads, along with using contractors where appropriate and economically sound i.e. tamarisk control along the river and drainage corridors, or large scale treatment of cheatgrass for fire rehabilitation treatments.

Prevention

Weed Coordinator:

- Orders and distributes prevention materials
- Conducts weed training sessions
- Attends interagency and county weed board meetings, along with delegated range specialist for the weed board area.
- Conducts/assists with public weed meetings if feasible
- Delegates duties to other weed, recreation, and range staff as needed
- Maintains currency as a certified applicator
- Works with GIS specialist on GIS database, along with Ecologist
- Supervises seasonal weed staff
- Prepares Pesticide Use Proposals and necessary NEPA
- Reports to State Office on annual accomplishments through Pesticide Use Reports
- Prepares contracts for weed treatments, COR's and designates a project inspector (PI)

- Reviews and approves weed stipulations for permitted activities
- Responsible for weed sections of NEPA documents and developing effective weed mitigation measures for projects
- Coordinates BLM's preventive weed treatment activities—eg. ensures annual inspections of boatramps, trailheads, livestock corrals etc. are carried out and weeds are treated in these areas.

Budget Needs
$500.00 annually for prevention materials.

Detection

Staffing yearly
- One seasonal Detection/Herbicide applicator, GS-5 for 5/6 months $22,000.00

General Duties:
- Identifies weeds, documents size of infestation, and topography using GPS
- Inputs weed data into GIS with assistance from GIS Specialist and Weed Coordinator
- Produces maps using Arc Map when necessary

Additional weed detection through BLM field staff and permittees will be developed through weed ID classes.

Logistical Needs:
- Range has one Artic Cat ATV and one old Honda, would like to trade in Artic Cat for new ATV, UTV already purchased $2000.00
- ATV training for seasonal employees, (Chris Pipkin, Sparky Taber) Montrose BLM has an ASI Instructor (or did have—Chad Greinor)
- Weed identification training
- GPS training

Budget Needs:
$24,000.00

Control

Staffing

- Two seasonal Certified Applicators for UTV, ATV-mounted spraying and backpack sprayers(Biological Technicians).

General Duties:
Under direction from Field Office Weed Coordinator:
- Vehicle operators will treat weeds along two track roads, trailheads, livestock developments, and other ATV accessible infestations using ATV and UTV mounted sprayers

- Treat weeds in remote areas by hiking in and using backpack sprayers, this will be done with prior logistical planning some camping may be necessary.

Additional spraying will be done by the counties along county roadways and potentially other areas on BLM lands. Large weed control projects will be pursued and carried out in concert with partners such as the UP Uravan Weed Management Project and The Nature Conservancy Tamarisk Project along the San Miguel River. These will require participation of the BLM weed coordinator before growing season to plan strategy and possible hiring of personnel, but budget needs are not discussed here. Other large weed control projects which will require the use of additional funds and outside contractors are not covered in this budget either.

Logistical/budget Needs:

- Staffing ~ $45,000.00
- ATV and UTV maintenance (included under detection)
- Vehicle 2 F-250 4x4, $4000.00 lease
- Fuel for vehicles and ATV/UTV, ≤ $2,000.00
- Herbicide $5000.00
- PPE, washable coveralls, gloves, rubber boots, hats, cleaning and replacement $500.00
- $15,000.00 to contract with counties, Montrose, Ouray, San Miguel and Delta, to spray county roads on BLM ground. Will need to coordinate with BLM so we can spray areas away from the road at the same time. Providing the budget allows for it, Counties will need to give paper work to BLM on what chemical was sprayed, amount sprayed, acres and weed species treated at the end of every two weeks. We are liable for keeping these records 10 years.

- **Budget Needs**: $ 71,000.00

Rehabilitation

Staffing

In general, most of the rehabilitation duties will fall on the Weed Coordinator and other resource staff interested in participating (Ecologist, Recreation etc.). Most treated areas won't require extensive rehabilitation; however some of the heavily infested areas may see more extensive treatment.

Budget Needs:

$1000.00 for seed reserve.

Total Operating Budget:

Prevention	$500.00
Detection	$22,000.00
Control	$71,000.00
Rehabilitation	$1000.00
TOTAL	$94,500.00