

# E C O L O G Y

## 2003 Annual Vegetation Management Plan for the Rocky Flats Environmental Technology Site



# **2003 Annual Vegetation Management Plan for the Rocky Flats Environmental Technology Site**

Kaiser-Hill, LLC  
Rocky Flats Environmental Technology Site  
Golden, Colorado 80402-0464

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### **Cover Photo Descriptions (top to bottom)**

**Top Photo:**

During 2002 fencelines in the western part of the Buffer Zone were repaired and cleared of old diffuse knapweed plants. Here a large pile of diffuse knapweed that had been “baled” was being put into a truck so it could be driven to the rolloff container for disposal.

**Middle Photo:**

Diffuse knapweed piled along a fenceline in the western Buffer Zone. This fence had been cleared of all diffuse knapweed approximately three weeks earlier. High winds over a weekend filled it back up.

**Lower Photo:**

Field ecologists handpulling dame’s rocket, a noxious weed, along Walnut Creek west of the A-Series ponds. Continued hand treatment of this, the only known population of dame’s rocket at the Site, has continued to reduce the amount present each year over the past four or five years.

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## **Acronyms and Abbreviations**

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APRS	Alien Plant Ranking System
CDA	Colorado Department of Agriculture
CERCLA	Comprehensive Environmental Response, Compensation, & Liability Act
CNAP	Colorado Natural Areas Program
DOE	Department of Energy
IA	Industrial Area
K-H	Kaiser-Hill Company, L.L.C.
PIDAS	Perimeter Intrusion Detection Assessment System
NFPA	National Fire Protection Association
RFFD	Rocky Flats Fire Department
Site	Rocky Flats Environmental Technology Site
USFWS	United States Fish and Wildlife Service

## Introduction

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The vegetation management goal at Rocky Flats Environmental Technology Site (Site) is to exercise good stewardship for preservation of the natural resources in the Buffer Zone while complying with applicable regulations and allowing Site closure to proceed unimpeded. The program incorporates an integrated ecosystem approach to natural resource management utilizing as many management techniques as possible, within the guidelines and special limitations that exist at a CERCLA site. The program is designed to control excessive vegetation that can increase wildfire hazards, to control present and future infestations of noxious weeds (DOE 1998), and to enhance the native plant communities. This Annual Vegetation Management Plan provides an integrated framework for managing vegetation, providing wildfire protection, protecting the natural resources of the Site Buffer Zone, and perpetuating native plant communities during 2003.

Some vegetation management actions serve dual purposes of controlling the spread of invasive weeds while reducing the accumulation of fuels that can carry uncontrolled wildfires across the Site and into improved areas. Invasions of non-native vegetation at the Site are degrading existing habitat quality in the undeveloped areas, reducing the coverage of the Site's high-value vegetation communities, and adversely affecting the conservation of Buffer Zone resources. The spread of some noxious weed species into the Industrial Area has increased the buildup of fuel along fences and against buildings (accumulation of tumbleweeds), which unchecked provides bridge areas where urban interface wildfires could attack structures and cause property damage. There are additional accumulations along line fences in the Buffer Zone. The long-term suppression of wildfires, combined with the past prohibition of prescribed burning at the Site (including cessation of burning of accumulated vegetation debris out of fences), has allowed a heavy accumulation of fine fuels. This has increased the risk of uncontrolled wildfires, and control problems at urban/wildland interface areas.

By controlling excessive weed growth, and mowing all vegetation around buildings and structures in the developed areas, fuel accumulation is reduced, and the sitewide noxious weed control effort enhanced. These vegetation control efforts implemented within the Industrial Area also reduce the secondary seed source from noxious weeds that grow in disturbed portions of the developed area.

Simply applying herbicides to noxious weeds in the Buffer Zone does not fully address the problem of vegetation debris accumulating to levels that increase the risk of rapid spread of wildfire. Nor does it restore natural processes that are important to improve the health and vigor of the native species so that they can better compete with invasive exotic species. To address problems other than noxious weed control, additional vegetation management actions are incorporated into this Plan.

The Integrated Weed Control Strategy (K-H 1997) calls for an annual weed control plan for each fiscal year, and the Vegetation Management Environmental Assessment (DOE 1999) required development of a Vegetation Management Plan to provide a vegetation management program that goes beyond only weed eradication goals. This document serves that purpose for 2003; it targets the major weed control efforts at species presenting the greatest threat to native plant communities, while outlining other vegetation management actions that contribute to personnel safety, aesthetics, and wildfire prevention and/or risk reduction.

Although no single weed control effort or strategy will completely remedy the noxious weed problems at the Site, this plan seeks to integrate various techniques to provide effective weed control and enhanced wildfire protection, while minimizing environmental damage and optimizing the use of available resources. Some vegetation management actions are important from the standpoint of reduction of biomass that would otherwise provide fuel for wildfires; others are more important from a resource management perspective. Implementation of these actions will involve a joint effort between the Kaiser-Hill Company, LLC (K-H) Ecology Group and Roads and Grounds personnel. In the past the plan has focused primarily on the Buffer Zone areas, however with the increasing revegetation activities taking place in the Industrial Area (IA) new sections have been added that address vegetation management issues in the IA.

## **Weed Control Strategy**

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### **Weed Control Program**

Vegetation management at the Site includes integration of the noxious weed control efforts with other means of vegetation control necessary for health and safety, resource conservation, fire safety, wildfire control, security, and traffic safety purposes. The weed control component of this program is discussed first because it is the largest-scale component, and the most complex. Most noxious weeds invade ecosystems because of disturbance, degradation, or changes in the natural system that alters resource availability thus making the community more prone to invasions (Davis et al. 2000). Long-term control of these noxious weeds will ultimately depend on restoring the natural processes (i.e., fire, grazing) that originally kept the ecosystem healthy. However, weed control is a critical component of an integrated management approach because it focuses efforts directly on the undesired species. The weed control measures in this plan are listed in the order they should be considered from an integrated weed management viewpoint, starting with the least toxic, non-chemical measures. Table 1 lists the weed and vegetation control methods currently in use at the Site.

### **Weed Ranking System and Control Prioritization**

#### **Weed Ranking System for Weed Control Planning**

During the winter of 2001-2002, noxious weeds (legally listed as "state noxious weeds" by the State of Colorado) that are known to occur at the Site were prioritized for control. Ranking was conducted using the Alien Plants Ranking System (APRS; Version 5.0) developed by Ron Hiebert of the National Park Service and Jim Stubbendieck of the University of Nebraska. The software, available free on the internet (<http://www.ripon.edu/faculty/beresk/aliens>), is described by the developers as

"...a computer program which allows the user to compare the impacts, current and potential, of nonnative plant species on a particular land area or site, and to consider the feasibility and urgency of taking control measures against particular exotic species. APRS is a tool to help managers evaluate the threats posed by nonindigenous plants. A data file for the site consists of a DataSheet for each alien species. The DataSheet has 23 questions which must be answered with reference to how the plant behaves on this particular site. These questions assess the ecological impacts of the species and its potential to become a pest. Following a thorough plant inventory, the data file for the site may be created by answering the questions for each alien species. This information is then processed to create graphs and reports indicating how each species ranks according to its level of impact, ease of control, and the urgency of management efforts."

Although 36 species of state listed noxious weeds are known to occur at the Site (Table 2), only those on the Colorado top ten noxious weed species prioritized for control (Table 3) and others considered a specific problem at the Site were ranked for control at this time.

This was done to simplify the ranking effort and due to the fact that many of the other state listed species, although occurring on the Site, are only found at isolated disturbed locations. Many of these latter species are also not aggressive, invasive species (under current conditions at the Site), and are not presently having a significant impact on the native plant communities at the Site. In the future the other listed species may be included in the ranking as necessary. The results of the analysis for each species are shown in alphabetical order in Table 4. Figure 1 graphically compares the species on the basis of their impact on the plant community versus their difficulty of control. The species with the greatest potential to impact the native plant communities and greatest difficulty of control are diffuse knapweed, Canada thistle, Russian knapweed, and Dalmatian toadflax. The aggressive nature, and ability of these species to dominate and replace the native plant communities, makes control of these species especially urgent. Annual rye, another species having an impact, but easier to control, is of concern at the Site because it has also begun to invade the surrounding native prairie at several locations, creeping in from the roadside edges where it originated.

In order to determine how, when, and where to expend limited resources for noxious weed control it is important to prioritize the species. Table 5 lists the prioritized weed species at the Site. Species were priority one or two on the basis of the above ranking system results, their need for control on the Site, and the difficulty of control. Note the table contains the state listed noxious weed species as well as a few others not listed by the state but which are considered problems at the Site. For some of the latter category species, the control of these species at this time is prudent because their current limited infestation levels are conducive for eradication of the species from the Site. Not all of these species listed in Table 5 are slated for specific control during 2003, however they may be included in control efforts directed towards other species.

Selected priority one species are slated for specific control efforts in 2003, while priority two species are not slated for specific control. However, priority two species may be indirectly affected by treatments directed at priority one species. High priority one species selected for particular emphasis in 2003 are Russian knapweed, Dame's rocket, and Scotch thistle. These species have been chosen because they are aggressive, occur in small patches where control has been done for several years, and continued efforts could eventually eradicate these species from the Site. Diffuse knapweed continues as a priority one threat because of the aggressive, invasive character of the plant and its ability to invade and dominate undisturbed native plant communities at the Site. Several years of large scale control using herbicides has begun to pay off for diffuse knapweed. Most large acreages at the Site where knapweed was present have been sprayed and currently have little knapweed present. Mapping results from 2002 showed large declines in diffuse knapweed abundance at the Site and combined with the effects of the drought and biocontrol insects attacking the species, it was decided that the aerial herbicide

applications would be suspended for 2003 (see reasons under diffuse knapweed control section). Instead localized ground applications of herbicides will be used for a few higher density areas of diffuse knapweed. This will give the biocontrol insects a chance to continue to increase and begin to reduce knapweed populations like what has been seen on Open Space property to the north of the Site.

Several other species are slated for various levels of control in 2003. The species are listed in Table 5, with specific control methods outlined in Table 6. Table 7 lists all the target weeds currently under evaluation for possible control at the Site and the potential methods that could be used for controlling them.

Noxious weed species may be added to the lists maintained under this program at any time, depending upon the adoption of noxious weed list revisions by state or local regulatory agencies. Table 8 lists noxious weeds that currently do not occur at the Site, but are on the Site watch list. If these species are found they will be immediately targeted for eradication. These species are particularly aggressive and without immediate control could become difficult and expensive to control. Therefore, immediate control measures are necessary for their eradication.

### **Biological Weed Controls (Insects)**

Biological control agents (i.e., insects) are being used on the Site to assist in the control of musk thistle, St. John's-wort, Dalmatian toadflax, Canada thistle, field bindweed, and diffuse knapweed. The insects have been provided to the Site by the Colorado Department of Agriculture (CDA), and the U.S. Fish and Wildlife Service (USFWS) through an agreement with Texas A&M University, to target specific weed infestations. Table 9 lists the biological controls that have been released at the Site. It is recommended that cooperative efforts with these groups continue with regard to the release of biological control agents for weed control at the Site. Additional releases of insects and other biological control agents for the above-listed, and other species could increase the effectiveness of the weed control efforts while potentially reducing costs. Communication with local researchers who are evaluating the use of biocontrols on nearby Open Space properties will be continued to keep abreast of any new findings and techniques.

Additional requests for biocontrol insects to be released at the Site in 2003 are to be made from the Colorado Department of Agriculture Insectary at Palisade, Colorado. These insects will be released at locations where other forms of control are impractical (i.e., riparian areas) and to complement other forms of weed control being used at the Site. Release locations will then also serve as nurseries for increasing biocontrol populations on Site, which can later be introduced to other locations at the Site. Monitoring of previous release locations will be conducted to evaluate establishment and impacts on the noxious weed populations.

## Chemical Weed Controls

The Ecology Group maintains a list of herbicides approved for use on the Site (Table 10). Herbicides *not* on the current list *may not* be used until they are approved. Many of these chemicals are restricted use herbicides, and must be applied only by a licensed (certified) applicator. Such restricted use herbicides may not be applied onsite by unlicensed applicators. Unrestricted use herbicides, such as Roundup, may however, be applied by unlicensed applicators, following label instructions. Herbicides cannot be stored or maintained onsite, empty containers may not be washed onsite, and used containers must be removed by the applicator at the end of the work shift. Disposal is strictly the responsibility of the applicator. The selected herbicides and application rates are based on the best available information, herbicide labels, and recommendations from experts (Beck 1992, Beck, 1996a, Beck 1996b, Beck, 1997a, Beck, 1997b, CNAP, 2000).

### Knapweed Treatment

Diffuse knapweed infestations on the Site remain significant enough that continued application of herbicides (Tordon 22K<sup>®</sup> and Transline<sup>®</sup>) to portions of the Buffer Zone during 2003 is planned. Monitoring results of past applications have shown large decreases in the abundance of diffuse knapweed present in treated areas. The large reduction of reproducing adult plants in these areas has reduced annual seed production, reduced the likelihood of the spread of the infestation from these areas (due to no adult plants being available to blow away), and dramatically improved the condition of the grassland. During 2003, small scale ground herbicide applications will be made to for diffuse knapweed control at selected locations (Figure 2). A total of approximately 108 acres are slated for ground application of herbicides for diffuse knapweed control in 2003.

The large scale aerial herbicide applications that have been conducted at the Site for diffuse knapweed control are being suspended for 2003. Several reasons (listed below) lead to the decision not to use the helicopter spraying in 2003.

1. The 2002 diffuse knapweed mapping data showed a substantial reduction in the total amount of acreage infested by diffuse knapweed. 2002 data showed approximately 1,093 acres of knapweed, compared to 2,913 acres in 1998. Additionally, most of the remaining acres are found along the bottom of the stream drainages, in or near Preble's habitat, or near the wetlands or riparian zones, where aerial herbicide applications are not feasible.
2. Field observations on the grassland areas during late fall and early winter of 2002-2003 showed few diffuse knapweed rosettes present at most locations where aerial applications were done in the past. The lack of rosettes may be attributable to past spraying efforts and/or the recent drought. In either case, in most of the areas where spraying would be possible, there is not enough of a problem at this point to warrant spraying with the helicopter in 2003. At the few small areas that need some chemical control during 2003, the use of ground application equipment is appropriate for control efforts.

3. During 2002, there were large numbers of biocontrol insects observed on the diffuse knapweed plants across the Site. Observations showed a lot of insect damage to the adult plants from 2002. Given this and the past effectiveness of the herbicide applications, the timing seems appropriate to give the biocontrol insects (that have been released at the Site over the past several years) the opportunity to continue to expand their populations. Suspending aerial herbicide application this year offers the opportunity to observe if similar reductions in diffuse knapweed populations can be achieved as have been observed on Open Space properties to the north of the Site, where the same biocontrol insects were released several years ago. At those locations for the past two years there has been little diffuse knapweed present. So stopping the aerial applications at the Site for 2003 will give the insects opportunity to further control the remaining knapweed populations at the Site. Monitoring in 2003 will evaluate the effectiveness of the biocontrol insects and be used to evaluate the need for future large scale chemical control for diffuse knapweed in 2004 and beyond.

The suspension of aerial herbicide applications in 2003 will be re-evaluated prior to the 2004 growing season, based on monitoring data and field observations to determine the activities planned for 2004. The suspension of aerial herbicide applications in 2003 does not preclude its use in 2004 and beyond.

### **Herbicide Applications for Other Target Weed Species**

In many cases where herbicides are applied by broadcast methods, several target species are often treated together (e.g., diffuse knapweed, musk thistle, common mullein, and Dalmatian toadflax). However, application of other herbicides or other management techniques may be necessary for species that are not affected by the broadcast herbicide treatments.

Broadcast herbicide applications are planned along the Buffer Zone roads to control jointed goatgrass, which has become a problem at numerous locations. Glyphosate (Roundup<sup>®</sup>) will be sprayed on the roads in early spring when the jointed goatgrass has begun to germinate. Glyphosate is a non-selective herbicide and using it early in season will only affect those things actively growing (i.e. jointed goatgrass, cheatgrass, and any other cool season weed species). The sprayed areas will be reseeded with native species to establish native species along the roadside at these locations and provide a perennial cover to compete with the weeds.

Herbicide applications for other less aggressive target species will be limited mostly to road shoulders, roadsides, disturbed areas, storage yards, and areas adjacent to or in the Industrial Area. In some cases, where ecological conditions allow, populations of these species within the native plant communities may be spot treated with herbicides. The goal of such applications will be to reduce or eliminate small populations that might otherwise expand aggressively, and/or to improve the quality of the native communities. This application strategy will be employed as needed throughout the growing season.

An example of this is the Russian knapweed population that was discovered on Site during 1998, which will be treated again with herbicides during 2003 to reduce the stand and keep it from spreading. The timing of application will be conducted prior to flowering of the species.

### **Spot Weed Control**

Spot weed control consists primarily of hand pulling, using sling blades or sickles, and spot spraying or wicking of individual plants. Spot control (using Roundup<sup>®</sup>) will be continued for small infestations of noxious weeds where this type of control method is suitable and effective. These methods have been used on the Site in recent years and will be continued in 2002 for the infestations of Scotch thistle, dame's rocket, bouncing bet, bird's-foot trefoil, hoary cress, Texas blueweed, Russian olive, yellow toadflax, and some of the smaller isolated patches of annual rye. Continued evaluation of the effectiveness of these measures will be conducted. The use of this method over the past several years has shown excellent control and reduction in the size of the infestations of Scotch thistle on the Site and could eliminate this species from the Site in the next few years if continued. Annual rye infestations have been reduced by mowing or cutting at the time of flower production. Russian olive, an exotic tree, which has caused substantial degradation of much of the riparian habitat along the Front Range of Colorado, also occurs on the Site at a few locations. Hand cutting of the few individual trees on the Site, combined with an herbicide applied to the cut stem, should eliminate many of the individuals of this species from the Site. As demolition projects progress, these projects are being requested to eliminate this species from their work areas as well.

### **Vegetation Management and the Preble's Mouse**

Figure 2 shows where broadcast herbicide applications are planned in the Buffer Zone during 2003, including where it will encroach near current Preble's meadow jumping mouse (*Zapus hudsonius preblei*) protection areas and proposed critical habitat. This particular species is of interest because it is a listed threatened species under the Endangered Species Act. A biological assessment and corresponding biological opinion for the Rock Creek Reserve allows up to 3 acres of weed control within current Preble's protection areas within the Rock Creek Reserve on an annual basis (USFWS 2001a, 2001b). For the purposes of this plan, the 3 acres allowed within current Preble's protection areas only applies to off-road applications. Herbicide applications and weed control efforts along already disturbed roadsides in the Buffer Zone, which do not constitute Preble's habitat, are not included in the 3 acre allotment. Actual locations for weed control within Preble's habitat in the Rock Creek Reserve will be coordinated and finalized with USFWS personnel.

# General Vegetation Management

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## Administrative and Cultural Weed Management Actions

Administrative and cultural weed management actions are incorporated into this Plan with the intention of preventing the introduction and spread of weeds at the Site. In the near future, as decommissioning and demolition of buildings in the Industrial Area occurs, a large amount of area will be subject to disturbance and subsequent revegetation. These areas must be protected from invasive weeds, and properly treated to encourage successful establishment of native vegetation cover. The preventative actions incorporated into this Vegetation Management Plan are listed in Table 11:

## Reclamation and Revegetation

### Industrial Area

As Site decommissioning and demolition projects continue to remove buildings and other structures from within the Industrial Area, revegetation of these locations will be necessary to prevent erosion and to return the areas to native grassland. A revegetation plan is in development for the Industrial Area that will contain specification sheets for the revegetation process. As areas are revegetated, monitoring will be conducted to evaluate the success of the reclamation and used to assess any future management needs. When warranted, weed control and/or reseeding of these areas will be conducted to establish the desired native plant species.

### Buffer Zone Area

Reclamation and revegetation of the closed roads, roadside edges, and noxious weed-infested areas in the Buffer Zone would help reduce future weed control costs. Revegetation of such areas speeds the natural process of succession and helps to move these areas beyond the early successional stage that encourages weed growth. Reseeding or transplanting native species into these areas encourages a return to native plant communities more quickly, allowing the desirable species to better compete with the weeds. Currently, all projects that disturb soil are required to reclaim and revegetate disturbed areas. As budget and time permit during 2003, other disturbed and/or low-quality areas in the Buffer Zone will be reclaimed in order to restore native vegetation and to assist with weed control.

### Species Prohibited in Revegetation Mixtures

The following graminoid species shall not be used in seed mixtures for reclamation and revegetation projects on Site:

- Annual rye grass                      *Secale cereale*

- Bulbous bluegrass      *Poa bulbosa*
- Crested wheatgrass      *Agropyron desertorum* or *Agropyron cristatum*
- Intermediate wheatgrass      *Agropyron intermedium*
- Johnsongrass      *Sorghum halepense*
- Orchardgrass      *Dactylis glomerata*
- Quackgrass      *Agropyron repens*
- Sheep fescue      *Festuca ovina*
- Smooth brome      *Bromus inermis*
- Timothy      *Phleum pratense*
- Wild proso millet      *Panicum milaceum*

## Physical or Mechanical Vegetation Control

### Grading

Grading of Buffer Zone roads will be continued in 2003 as a mechanical method of vegetation control along the unpaved roads. Grading maintains unvegetated firebreaks that serve as access roads into the Buffer Zone for fire fighting equipment. To prevent unnecessary disturbance of native prairie, and to limit the size of the seedbed for noxious weeds, graded widths are maintained as specified under this plan. Grading will not widen the existing roads. If budget and manpower are available, designated roads will be graded at least twice per growing season, with specific times for grading determined by the K-H Ecology Group and work performed by Buildings and Grounds personnel, to ensure the greatest effectiveness on roadside weeds and wildfire fuel control. At some locations, as possible, the large rock rows on both sides of the road will continue to be reduced and spread back out over the road surface, to allow the mowing equipment better access for mowing the roadside edge. The rock row grading will not widen the road and the rocks from the rows should be spread near the road edge, leaving a smooth travel surface down the center of the roads. Figure 3 shows approximately 18 miles of roads to be graded during 2003.

### Mowing

#### Roadside Mowing

In addition to the road grading in 2003, roadsides along certain Buffer Zone roads, and along all Site access roads, will be mowed to keep the weeds cut back. There are several purposes for mowing roadsides. Properly timed, mowing can stress weeds and impact seed-set of these undesirable plants, which aids in the control of noxious weeds. For practical travel safety reasons, keeping roadside vegetation cut low in some areas is also needed. Mowing road edges increases visibility of wildlife crossing the roads and can help reduce collisions between wildlife and cars, as well as provide better visibility at intersections. Reduction of roadside vegetation height also reduces the available fuel at the margins of the firebreak and paved roads, functionally enhancing their ability to impede the spread of wildfires, and aiding firefighters in extinguishing fires in these lower-fuel buffer areas. Mowing can be done along any of the roads slated for grading, if grading is not possible in these areas. The East and West Access Roads will be mowed a

minimum of 25 feet from the edges of pavement to maintain a fire protection perimeter, in accordance with National Fire Protection Association (NFPA; 1997) code, for these egress routes. Figure 3 shows the Buffer Zone roads slated for mowing during 2003. In addition to the Buffer Zone and Access roads, all roadsides within the Industrial Area will be mowed, as practicable, out to a minimum of 25 feet from pavement.

### **Mowing for Building and Structure Protection**

Mowing is generally conducted for aesthetic purposes in certain highly visible locations such as lawns around buildings and in common areas. In addition to aesthetic enhancement, mowing in these areas reduces fuel height, thereby reducing the potential for a wildfire to spread rapidly into buildings and other improvements. Shorter vegetation also enhances pedestrian safety in such areas by increasing visibility of uneven ground surface features, and poisonous snakes. Lawns and other vegetation surrounding buildings and structures at the Site will be mowed to maintain a height of no greater than 4 inches out to a minimum of 50 feet (as practicable) from the buildings or structures requiring protection. Mowing shall occur as needed, or as requested by the Rocky Flats Fire Department (RFFD), to maintain this fire protection perimeter in conformance to NFPA code (NFPA 1997) and RFFD procedures.

### **Special Mowing for Weed Control**

In addition to mowing along roads, mowing will be used at some off-road Buffer Zone locations for control of annual rye (Figure 3). The annual rye locations will be mowed during flower production (but before seed set) to eliminate the annual production of seed. Application of this methodology for the next few years should reduce and control the annual rye at these locations by preventing annual seed production and slowly exhausting the seed bank. Mowing may also be conducted and timed to reduce seed set of jointed goatgrass along certain Buffer Zone firebreak roads.

### **Special Vegetation Control for Transformers**

To prevent the buildup of vegetation fuels in transformer areas, all vegetation must be eliminated from the fencing and enclosed areas around transformers. The safest, most practical means of vegetation management in these areas is the application of a total-kill herbicide. Areas within transformer enclosures, including the fencing itself, shall be maintained in a vegetation-free condition. Approved total-kill herbicides shall be applied as needed, or as requested by the RFFD to prevent accumulation of any vegetation in these areas in conformance with NFPA code (NFPA 1997) and RFFD procedures. Should there be no enclosure fence, an area that will provide a 15-foot fire protection perimeter around the installation shall be kept vegetation-free by the use of mowing and herbicides as required.

## **Vegetation Management for Security Purposes**

In some areas vegetation must be managed to ensure that security needs are achieved. Vegetation will be maintained at a height no greater than 4 inches overall in all Security perimeter areas. Where no vegetation at all can be allowed to grow in the Perimeter Intrusion Detection Assessment System (PIDAS) around the Protected Area, total-kill herbicides will be applied as needed to curtail any plant growth. Within the boundaries of the abandoned PIDAS, broadleaf weed herbicide will be applied to control noxious weed growth until such time as the former PIDAS is finally reclaimed and revegetated. Mowing and removal of vegetation from security perimeters will be done as needed, or as requested by the Site Security Force.

## **Wildfire Risk Reduction Actions**

In addition to the fuel reduction actions already discussed, weeds and debris that have accumulated in fences will be removed as needed. This removal may include physical removal and disposal of accumulated debris in appropriate waste containers, or once prescribed burning is again allowed on Site, by burning such debris out of fences in situ. This removal shall occur as needed (weather conditions heavily influence the rate of accumulation) or as requested by the RFFD, for conformance with NFPA code (NFPA 1997) and RFFD procedures. Vegetation debris *shall not* be tossed loose, or disposed of *anywhere* except in appropriate waste containers destined for offsite landfill disposal.

## **Prescribed Burning and Grazing**

The use of prescribed burns and grazing on Site grasslands is highly recommended as a management tool to help control weeds, reduce plant litter, recycle nutrients, and improve the health and vigor of the native plant communities. Weed control strategies that focus solely on the weed species and not on enhancing conditions for desired native species will provide only limited success. If desired native species are not able to fill in the openings created in the native plant communities after target weed species are eliminated, then often other undesirable weeds come in and take their place instead. The tools available for resource management at the Site are currently limited by Site policies. This is especially true with regard to grassland resource management where the natural processes of grazing and fire are essential for prairie health. Currently grazing is not permitted at the Site and prescribed burns have been suspended pending the development of a natural resource management plan by the U.S. Fish and Wildlife Service for the Rocky Flats National Wildlife Refuge.

## **Conclusions**

Strides have been made in recent years at the Site to implement an integrated, ecosystem management program for natural resource management. During 2003 several techniques will be employed to restore, improve, and preserve the increasingly rare plant communities that provide habitat for imperiled plant and animal species at the Site. If some of the areas slated for control are not completed during 2003, they will be added to the list for 2004.

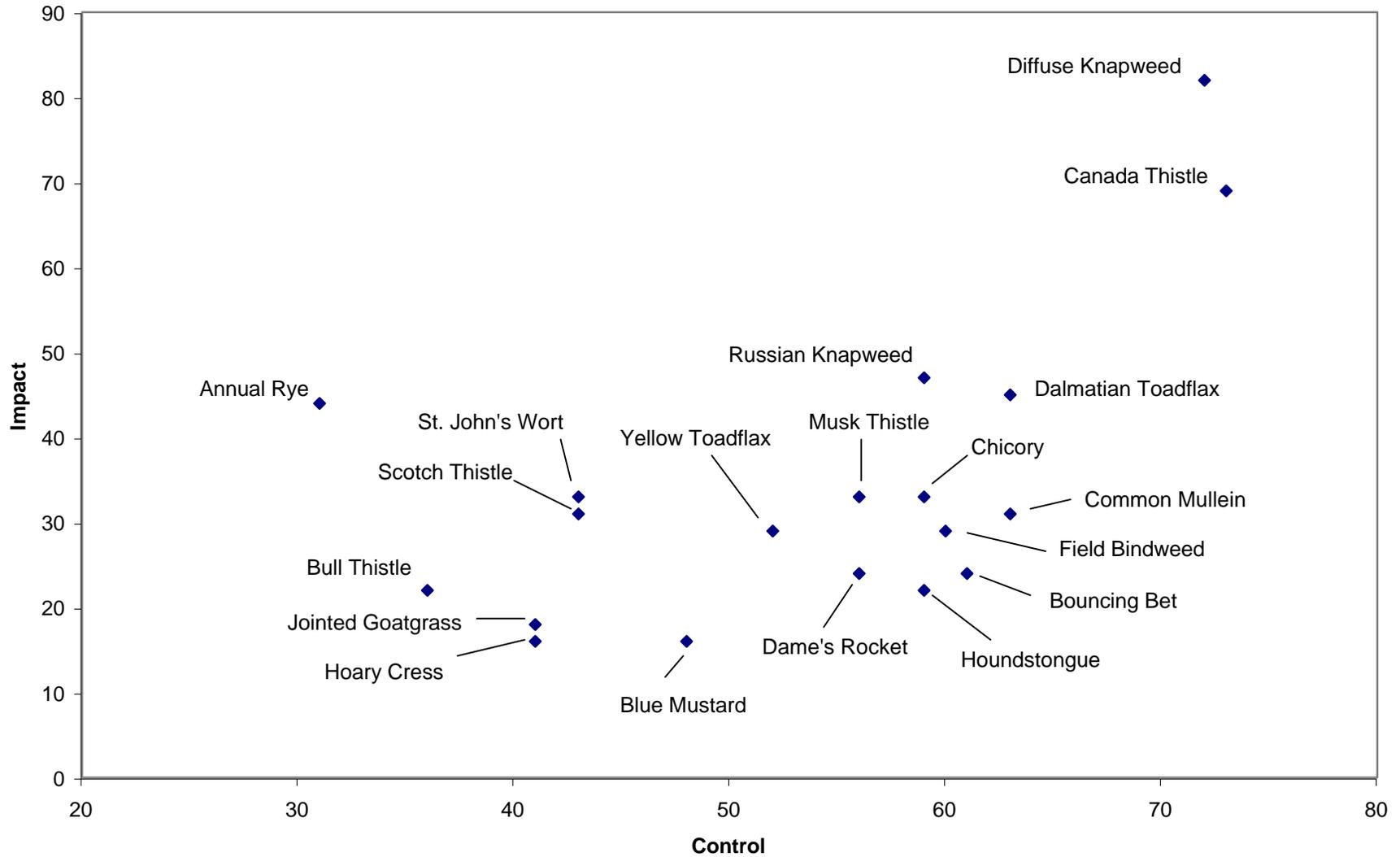
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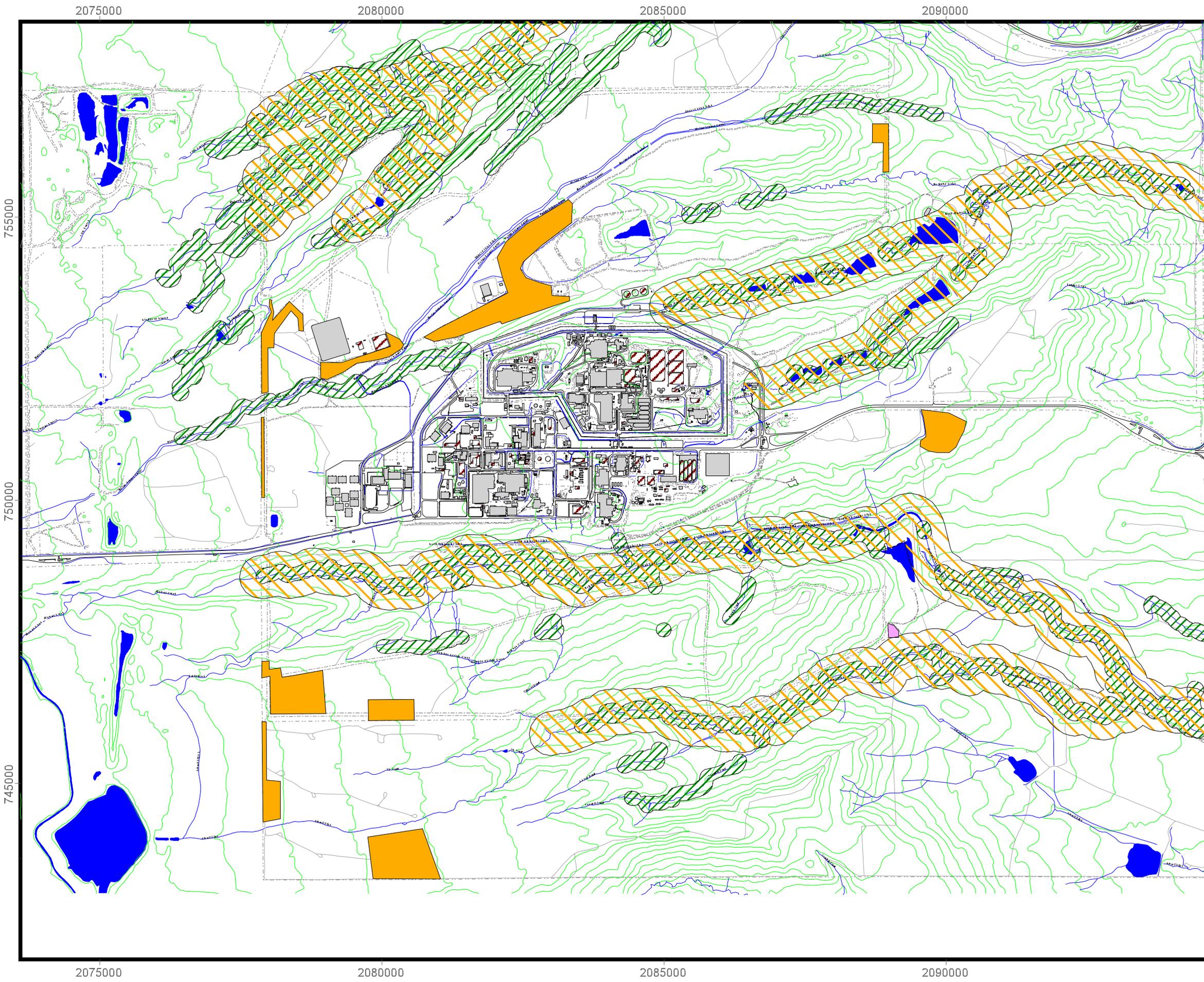
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**Figure 1. Alien Plants Ranking System Results For Selected Noxious Weeds At The Site.**





# 2003 Broadcast Herbicide Application Locations

Figure 2

## Legend

-  Telar Locations
-  Transline Locations
-  Current Preble's Protection Areas
-  Proposed Critical Habitat

## Standard Features

-  Buildings
-  Demolished Buildings
-  Lakes & ponds
-  Streams & ditches
-  Fences
-  Paved roads
-  Dirt roads
-  Contours (20 ft. intervals)

DATA SOURCE BASE FEATURES:  
Buildings, fences, hydrography, roads and other structures from 1994 aerial fly-over data captured by EG&G RSL, Las Vegas. Digitized from the orthophotographs, 1/95.

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1:19914



State Plane Coordinate Projection  
Colorado Central Zone  
Datum: NAD27

U.S. Department of Energy  
Rocky Flats Environmental Technology Site

Prepared by:  For: 

©\Projects\030303-0012\0303 herbicide appl locations.apr\figure 2

2075000

2080000

2085000

2090000

# Road Grading and Mowing Locations

Figure 3

## Legend

-  Annual Rye Mowing Location
-  Roadside Grading and Roadside Mowing Locations
-  Roadside Mowing Only

## Standard Features

-  Buildings
-  Demolished Buildings
-  Lakes & ponds
-  Streams & ditches
-  Fences
-  Paved roads
-  Dirt roads
-  Contours (20 ft. intervals)

DATA SOURCE BASE FEATURES:  
Buildings, fences, hydrography, roads and other structures from 1994 aerial fly-over data captured by EG&G RSL, Las Vegas. Digitized from the orthophotographs, 1/95.

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1:22209

1000 0 1000 2000 Feet



State Plane Coordinate Projection  
Colorado Central Zone  
Datum: NAD27

U.S. Department of Energy  
Rocky Flats Environmental Technology Site

Prepared by:



For:



Kaiser-Hill Company, LLC

RFETS GIS Dept. 303-966-7707

MAP ID: 03-0012

April 8, 2003

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2075000

2080000

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755000

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**Table 1. Weed Control Methods for the Site**

Treatment Option	Control Method
Administrative Controls	Administrative policies and procedures
Cultural Controls	Reclamation and revegetation requirements
Physical or Mechanical Controls	Grading
	Mowing
	Prescribed Burns*
	Hand-pulling
Biological Controls	Insects
Chemical Controls	Herbicide application

\* Prescribed burns have been put on hold until the USFWS develops and implements their management plans for the refuge after closure.

**Table 2. Noxious Weeds Occurring at the Rocky Flats Environmental Technology Site**

+Annual Rye ( <i>Secale cereale</i> )	*Kochia ( <i>Kochia scoparia</i> )
*Blue mustard ( <i>Chorispora tenella</i> )	*Mayweed chamomile ( <i>Anthemis cotula</i> )
*Bouncing bet ( <i>Saponaria officinalis</i> )	*Moth mullein ( <i>Verbascum blattaria</i> )
*Bull thistle ( <i>Cirsium vulgare</i> )	*Musk thistle ( <i>Carduus nutans</i> )
*Canada thistle ( <i>Cirsium arvense</i> )	*Oxeye daisy ( <i>Chrysanthemum leucanthemum</i> )
*Chicory ( <i>Cichorium intybus</i> )	*Perennial Sowthistle ( <i>Sonchus arvensis</i> )
*Common burdock ( <i>Arctium minus</i> )	*Poison hemlock ( <i>Conium maculatum</i> )
*Common mullein ( <i>Verbascum thapsus</i> )	*Puncturevine ( <i>Tribulus terrestris</i> )
*Common St. Johnswort ( <i>Hypericum perforatum</i> )	*Quackgrass ( <i>Elytrigia repens</i> )
*Dalmatian toadflax ( <i>Linaria dalmatica</i> )	*Redstem filaree ( <i>Erodium cicutarium</i> )
*Dame's rocket ( <i>Hesperis matronalis</i> )	*Russian knapweed ( <i>Centaurea repens</i> )
*Diffuse knapweed ( <i>Centaurea diffusa</i> )	*Russian olive ( <i>Elaeagnus angustifolia</i> )
*Downy brome ( <i>Bromus tectorum</i> )	*Russian thistle ( <i>Salsola iberica</i> )
*Field bindweed ( <i>Convolvulus arvensis</i> )	*Saltcedar ( <i>Tamarix ramosissima</i> )
*Flixweed ( <i>Descurainia sophia</i> )	*Scotch thistle ( <i>Onopordum acanthium</i> )
*Green foxtail ( <i>Setaria viridis</i> )	*Shepardspurse ( <i>Capsella bursa-pastoris</i> )
*Hoary cress ( <i>Cardaria draba</i> )	*Wild Oats ( <i>Avena fatua</i> )
*Houndstongue ( <i>Cynoglossum officinale</i> )	*Yellow toadflax ( <i>Linaria vulgaris</i> )
*Jointed goatgrass ( <i>Aegilops cylindrica</i> )	

\* Noxious weeds as listed by the State of Colorado Noxious Weed Act (2001).

+ Additional species considered a noxious weed at the Site.

**Table 3. Top 10 Prioritized Noxious Weed Species for the State of Colorado**

- \*Canada thistle (*Cirsium arvense*)
- \*Dalmatian toadflax (*Linaria dalmatica*)
- \*Diffuse knapweed (*Centaurea diffusa*)
- \*Field bindweed (*Convolvulus arvensis*)
- \*Hoary cress (*Cardaria draba*)
- \*Houndstongue (*Cynoglossum officinale*)
- Leafy spurge (*Euphorbia esula*)
- \*Musk thistle (*Carduus nutans*)
- \*Russian knapweed (*Centaurea repens*)
- \*Yellow toadflax (*Linaria vulgaris*)

List is in alphabetical order.

\* Species known to occur at Rocky Flats Environmental Technology Site.

**Table 4. Alien Plants Ranking System Results for Selected Noxious Weeds at Rocky Flats Environmental Technology Site**

Species	Impact	Pest	Control
Annual rye	44	52	31
Blue mustard	16	38	48
Bouncing bet	24	52	61
Bull thistle	22	57	36
Canada thistle	69	78	73
Chicory	24	52	56
Common mullein	31	49	63
Dalmatian toadflax	45	65	63
Dame's rocket	33	60	59
Diffuse knapweed	82	78	72
Field bindweed	29	52	60
Hoary cress	16	46	41
Houndstongue	22	51	59
Jointed goatgrass	18	52	41
Musk thistle	33	63	56
Russian knapweed	47	79	59
Scotch thistle	31	57	43
St. John's-wort	33	70	43
Yellow toadflax	29	56	52

List is in alphabetical order. Scores are based on answers to questions in Alien Plant Ranking System. Impact refers to the significance or impact of a species based on your site's characteristics. Pest refers to the innate ability of a plant species to be a pest. Control refers to the difficulty of controlling the species. Ranking scores range from 0 = low or easier to control to 100 = high or difficult to control.

**Table 5. 2003 List of Noxious Weeds Prioritized for Control at Rocky Flats Environmental Technology Site**

<b>Priority 1 Species</b>	<b>Priority 2 Species</b>
+Annual Rye ( <i>Secale cereale</i> )	*Blue mustard ( <i>Chorispora tenella</i> )
+Bird's-foot trefoil ( <i>Lotus corniculatus</i> )	*Bull thistle ( <i>Cirsium vulgare</i> )
*Bouncing bet ( <i>Saponaria officinalis</i> )	*Chicory ( <i>Cichorium intybus</i> )
*Canada thistle ( <i>Cirsium arvense</i> )	*Common burdock ( <i>Arctium minus</i> )
*Common mullein ( <i>Verbascum thapsus</i> )	*Downy brome ( <i>Bromus tectorum</i> )
*Common St. Johnswort ( <i>Hypericum perforatum</i> )	*Flixweed ( <i>Descurainia sophia</i> )
+Crown vetch ( <i>Coronilla varia</i> )	*Green foxtail ( <i>Setaria viridis</i> )
*Dalmatian toadflax ( <i>Linaria dalmatica</i> )	*Houndstongue ( <i>Cynoglossum officinale</i> )
*Dame's rocket ( <i>Hesperis matronalis</i> )	*Kochia ( <i>Kochia scoparia</i> )
*Diffuse knapweed ( <i>Centaurea diffusa</i> )	*Mayweed chamomile ( <i>Anthemis cotula</i> )
*Field bindweed ( <i>Convolvulus arvensis</i> )	*Moth Mullein ( <i>Verbascum blattaria</i> )
*Hoary cress ( <i>Cardaria draba</i> )	*Oxeye daisy ( <i>Chrysanthemum leucanthemum</i> )
*Jointed goatgrass ( <i>Aegilops cylindrica</i> )	*Perennial Sowthistle ( <i>Sonchus arvensis</i> )
+Lens-padded hoary cress ( <i>Cardaria chalapensis</i> )	*Poison hemlock ( <i>Conium maculatum</i> )
*Musk thistle ( <i>Carduus nutans</i> )	*Puncturevine ( <i>Tribulus terrestris</i> )
+Russian olive ( <i>Elaeagnus angustifolia</i> )	*Quackgrass ( <i>Elytrigia repens</i> )
*Russian knapweed ( <i>Centaurea repens</i> )	*Redstem filaree ( <i>Erodium cicutarium</i> )
*Scotch thistle ( <i>Onopordum acanthium</i> )	*Russian thistle ( <i>Salsola iberica</i> )
+Texas blueweed ( <i>Helianthus ciliaris</i> )	*Saltcedar ( <i>Tamarix ramosissima</i> )
*Yellow toadflax ( <i>Linaria vulgaris</i> )	*Shepardspurse ( <i>Capsella bursa-pastoris</i> )
	*Wild Oats ( <i>Avena fatua</i> )

\* Noxious weeds as listed by the State of Colorado Noxious Weed Act.

+ Additional species considered a noxious weed at the Site.

**Table 6. Control Measures for Selected Species**

Diffuse Knapweed	<ul style="list-style-type: none"> <li>• Mowing along main access roads and Buffer Zone fire break roads will be continued to help control the diffuse knapweed present in these areas.</li> <li>• Ground application of Tordon 22K<sup>®</sup> and Transline<sup>®</sup> herbicides will continue at selected locations in the Buffer Zone to control denser areas of diffuse knapweed.</li> <li>• Additional biocontrol insects will be requested from the Colorado Department of Agriculture Insectary at Palisade, Colorado, for release at the Site. These insects will be released at areas where other forms of control are impractical (i.e. riparian corridors) in order to try and control infestations at these locations. These areas will then also serve as nurseries, for increasing biocontrol populations that can later be introduced to other locations at the Site.</li> <li>• Monitoring and mapping of control efforts will continue to evaluate the effectiveness of control techniques.</li> </ul>
Russian Knapweed	<ul style="list-style-type: none"> <li>• Ground herbicide applications, to control the small infestation (&lt;1 acre) of Russian knapweed found at the Site, will continue.</li> <li>• Continued reseeding with native perennial grasses to reestablish a native cover.</li> </ul>
Annual Rye	<ul style="list-style-type: none"> <li>• Mowing will be used in the xeric tallgrass prairie to prevent seed-set in a large infestation of annual rye along a firebreak road in the north Buffer Zone.</li> <li>• At several locations in the southeast Buffer Zone where there are smaller infestations, sickles will be used to prevent seed-set.</li> </ul>
Scotch Thistle	<ul style="list-style-type: none"> <li>• Hand pulling, hand cutting, and spot herbicide treatments with Roundup will be used to control the few small infestations remaining at several locations in the Buffer Zone.</li> </ul>
Dame's Rocket, Bouncing bet, Crown Vetch, Lens Padded Hoary Cress	<ul style="list-style-type: none"> <li>• Hand pulling, sickles, and spot herbicide treatments with Roundup will be used to control the few small infestations at the Site.</li> </ul>
Dalmatian Toadflax	<ul style="list-style-type: none"> <li>• Since 1999, nearly 4,000 acres of the Buffer Zone have been treated with Tordon22K<sup>®</sup> and Transline<sup>®</sup>. The Tordon22K<sup>®</sup> applications have had some effect on setting this species back, reducing flowering (and thus potentially seed set), and reducing abundance. Monitoring of these effects on Dalmatian toadflax will continue in 2003.</li> <li>• Ground herbicide applications of Tordon22K<sup>®</sup> will be used to help control infestations of this species that are in the target infestations of diffuse knapweed. This will be part of a multi-species control effort.</li> <li>• Monitoring will be conducted at the locations where the biocontrol insect, <i>Mecinus janthinus</i>, was released in 2001 and 2002, to determine whether the insects established and are having any impacts.</li> <li>• Test plots may be established to evaluate the impacts of different herbicide combinations on Dalmatian toadflax.</li> <li>• As feasible, Dalmatian toadflax will be mapped during 2003.</li> </ul>

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Canada Thistle	<ul style="list-style-type: none"> <li>• In 2000, 200 individuals of the biocontrol fly, <i>Urophora cardui</i>, were released at 2 locations in Rock Creek. In 2002, another 200 individuals were released in Woman Creek. These sites will be revisited to determine if the flies survived and if any damage (galls) is present on the Canada thistle plants in the area of their release. In 2001, a defoliating beetle, <i>Cassida rubiginosa</i>, was released at another location in Rock Creek. This site will be evaluated for any impacts. Additional releases of both biocontrol insects will be made if insects can be obtained from the Colorado Department of Agriculture.</li> <li>• Limited herbicide applications and/or mowing (&lt;3 acres) will be used on infestations in the Rock Creek drainage.</li> </ul>
Russian Olive	<ul style="list-style-type: none"> <li>• The isolated trees occurring on Site will continue to be cut down and the trunks treated with Roundup to prevent regeneration.</li> <li>• Alternatively, trees may be girdled and Roundup sprayed into the girdled area.</li> <li>• Whenever possible, demolition actions will include removal of any Russian olive trees.</li> </ul>
Field Bindweed	<ul style="list-style-type: none"> <li>• Monitoring will be conducted at the locations where the biocontrol insect, <i>Aceria malherbae</i>, was released in 2001 and 2002, to determine whether the insects established and are having any impacts. As population establishment allows, <i>A. malherbae</i> will be transplanted to new locations as well.</li> </ul>
Bird's-Foot Trefoil, Hoary Cress, Texas Blueweed, and Yellow Toadflax	<ul style="list-style-type: none"> <li>• Spot herbicide applications of Roundup® will be made to eradicate the isolated patches of these species in the Buffer Zone at the Site. Monitoring will be conducted as feasible to evaluate control efforts for these species.</li> </ul>
Jointed Goatgrass	<ul style="list-style-type: none"> <li>• Mowing and grading will be timed to attempt to prevent seed set of this species along the Buffer Zone roads where it occurs.</li> <li>• Herbicide applications and reseeding with native species will be used at some locations along Buffer Zone roads to assist in control of the species.</li> </ul>
Musk Thistle and Common Mullein	<ul style="list-style-type: none"> <li>• Ground herbicide applications will be used to assist in controlling several infestations of these species that are in the target infestations of diffuse knapweed. This will be part of a multi-species control effort.</li> <li>• The musk thistle biocontrol insect, <i>Rhinocyllus conicus</i>, will be evaluated at several infestations to ensure that populations continue to be present at the Site.</li> <li>• Where the biocontrol insect, <i>Trichosirocalus horridus</i>, for musk thistle control was released in 2001, monitoring will be conducted to determine whether the species established and whether any impacts can be observed.</li> </ul>
Common St. John's-wort	<ul style="list-style-type: none"> <li>• Foliage feeding beetles, <i>Chrysolina quadrigemina</i>, that were transferred in 2000 to St. John's-wort infestations east of the Lindsay Ranch, in Rock Creek, from other areas on the Site will be evaluated. Additional insects will be collected and released as needed for the problem on this hillside.</li> <li>• Spot herbicide applications may be used to control some populations of this species.</li> </ul>

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**Table 7. Target Weeds At Rocky Flats and Potential Control Methods**

Target Pest Common Name (Scientific Name)	Control Method			
	Mechanical	Biocontrol	Chemical	Chemical Use Application Method
Annual Rye ( <i>Secale cereale</i> )	Mowing/Weed Whack			
Bird's-foot trefoil ( <i>Lotus corniculatus</i> )			Roundup	Backpack/Wick
Blue mustard ( <i>Chorispora tenella</i> )				
Bouncing bet ( <i>Saponaria officinalis</i> )	Weed Whack		Roundup	Backpack/Wick
Bull thistle ( <i>Cirsium vulgare</i> )				
Canada thistle ( <i>Cirsium arvense</i> )	Mowing/Weed Whack	Yes	Roundup	Backpack/Wick
			Transline	Broadcast/Backpack (only if mowed first)
			Tordon 22K	
Chicory ( <i>Cichorium intybus</i> )				
Common burdock ( <i>Arctium minus</i> )				
Common mullein ( <i>Verbascum thapsus</i> )	Mowing		Tordon 22K	Broadcast
Common St. Johnswort ( <i>Hypericum perforatum</i> )	Weed Whack	Yes		
Crown vetch ( <i>Coronilla varia</i> )			Roundup	Backpack/Wick
Dalmatian toadflax ( <i>Linaria dalmatica</i> )		Yes	Tordon 22K	Broadcast (only as part of control for other species)
Dame's rocket ( <i>Hesperis matronalis</i> )	Weed Whack/Hand Pull		Roundup	Backpack/Wick
Diffuse knapweed ( <i>Centaurea diffusa</i> )	Mowing	Yes	Tordon 22K	Broadcast
			Transline	
Downy brome ( <i>Bromus tectorum</i> )				
Field bindweed ( <i>Convolvulus arvensis</i> )		Yes		
Flixweed ( <i>Descurainia sophia</i> )				
Green foxtail ( <i>Setaria viridis</i> )				
Hoary cress ( <i>Cardaria draba</i> )			Telar	Broadcast/Backpack
Houndstongue ( <i>Cynoglossum officinale</i> )				
Jointed goatgrass ( <i>Aegilops cylindrica</i> )	Mowing		Roundup	Broadcast/Backpack
Kochia ( <i>Kochia scoparia</i> )	Mowing			Broadcast
Lens-padded hoary cress ( <i>Cardaria chalapensis</i> )			Roundup	Backpack/Wick
Mayweed chamomile ( <i>Anthemis cotula</i> )				
Moth mullein ( <i>Verbascum blattaria</i> )				
Musk thistle ( <i>Carduus nutans</i> )	Mowing	Yes	Transline	Broadcast
			Tordon 22K	
Oxeye daisy ( <i>Chrysanthemum leucanthemum</i> )				
Perennial Sowthistle ( <i>Sonchus arvensis</i> )				

**Table 7. (cont.)**

Target Pest Common Name (Scientific Name)	Control Method			Chemical Use
	Mechanical	Biocontrol	Chemical	Application Method
Poison hemlock ( <i>Conium maculatum</i> )				
Puncturevine ( <i>Tribulus terrestris</i> )				
Quackgrass ( <i>Elytrigia repens</i> )				
Redstem filaree ( <i>Erodium cicutarium</i> )				
Russian knapweed ( <i>Centaurea repens</i> )	Mowing		Tordon22K Telar Roundup	Broadcast
Russian olive ( <i>Elaeagnus angustifolia</i> )	Cutting/Removal		Roundup	Backpack/Squirt Bottle
Russian thistle ( <i>Salsola iberica</i> )				
Saltcedar ( <i>Tamarix ramosissima</i> )	Cutting/Removal		Roundup	Backpack/Squirt Bottle
Scotch thistle ( <i>Onopordum acanthium</i> )	Weed Whack/Hand Pull		Roundup	Backpack/Wick
Shepardspurse ( <i>Capsella bursa-pastoris</i> )				
Texas blueweed ( <i>Helianthus ciliaris</i> )			Roundup	Backpack/Wick
Wild Oats ( <i>Avena fatua</i> )				
Yellow toadflax ( <i>Linaria vulgaris</i> )			Roundup	Backpack/Wick

Shaded species currently have no specific control methods applied. They may however, be indirectly controlled as part of control activities for other species

**Table 8. Rocky Flats Noxious Weed Watch List\***


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Common teasel ( <i>Dipsacus fullonum</i> )
Dame's rocket ( <i>Hesperis matronalis</i> )
Leafy spurge ( <i>Euphorbia esula</i> )
Mediterranean sage ( <i>Salvia aethiopsis</i> )
Myrtle spurge ( <i>Euphorbia myrsinites</i> )
Orange hawkweed ( <i>Hieracium aurantiacum</i> )
Purple loosestrife ( <i>Lythrum salicaria</i> )
Russian knapweed ( <i>Centaurea repens</i> )
Scotch thistle ( <i>Onopordum acanthium</i> and <i>Onopordum tauricum</i> )
Spotted knapweed ( <i>Centaurea maculosa</i> )
Sulfur cinquefoil ( <i>Potentilla recta</i> )
Yellow starthistle ( <i>Centaurea solstitialis</i> )

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List is in alphabetical order.

Species on the watch list do not yet occur at the Site, but are in the vicinity and will require immediate control efforts if found at the Site.

**Table 9. Biological Control Agents Released at the Site**


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Target Species	Beneficial Organism	Effect
Diffuse knapweed ( <i>Centaurea diffusa</i> )	<i>Urophora quadrifasciata</i>	Attacks knapweed flowers, producing galls that reduce seed production.
	<i>Urophora affinis</i>	Attacks knapweed flowers, producing galls that reduce seed production.
	<i>Sphenoptera jugoslavica</i>	Beetle larvae bore into root crown and upper roots of knapweed, retarding plant development and stunting growth.
	<i>Larinus minutus</i>	A seedhead weevil.
	<i>Cyphocleonus achates</i>	A root boring weevil.
Musk thistle ( <i>Carduus nutans</i> )	<i>Rhinocyllus conicus</i>	A weevil that eats the seeds in the musk flower heads.
	<i>Trichosiromus horridus</i>	Weevil that attacks the crown of musk thistle, thus killing the apical meristem and reducing the potential of the plant to flower.
Canada thistle ( <i>Cirsium arvense</i> )	<i>Urophora carduii</i>	A gall fly.
	<i>Cassida rubiginosa</i>	A defoliating beetle.
St. Johns-wort ( <i>Hypericum perforatum</i> )	<i>Chrysolina quadrigemina</i>	A foliage-feeding beetle.
Dalmatian toadflax ( <i>Linaria dalmatica</i> )	<i>Calophasia lunula</i>	Larvae of this moth feed on the leaves and flowers of the plant.
	<i>Mecinus janthinus</i>	A stem mining beetle.
Field Bindweed ( <i>Convolvulus arvensis</i> )	<i>Aceria malherbae</i>	A gall mite.

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**Table 10. Approved Herbicides for Use at Rocky Flats (Last updated 10/18/01)**

<u>Herbicide Name</u>	<u>Active Ingredient</u>
Arsenal	Imazapyr
Banvel	Dicamba
Buctril	Bromoxynil
Escort	Metsulfuron
Gallery	Isoxaben
Karmex	Diuron
Oust	Sulfometuron
Plateau	Imidazolinone
Rodeo	Glyphosphate
Roundup	Glyphosphate
Sahara	Diuron; Imazapyr
Surflan	Oryzalin
Telar	Chlorsulfuron
Transline	Clopyralid
Tordon 22K	Picloram

**Table 11. Preventative Actions for Weed Control**

Weed-free Materials	<ul style="list-style-type: none"> <li>All revegetation projects at the Site will use weed-free seed and mulch sources. Native hay mulch will be used when hydromulch is not appropriate. Seed mixes will be composed of appropriate native species for the locations.</li> </ul>
Approved Seed Mixtures Only	<ul style="list-style-type: none"> <li>All seed mixtures for Site reclamation and revegetation projects must be approved by the K-H Ecology Group. All seed mixtures to be used on Site will be inspected, prior to planting (as feasible), by a qualified ecologist to ensure that the proper seed mixture was obtained. Use of native species will be required in all cases, except when specific written prior approval has been obtained from the K-H Ecology Group.</li> </ul>
Sterile Mulch	<ul style="list-style-type: none"> <li>All native hay used for mulch on the Site will be weed-free and free of crop seed heads (i.e., threshed straw).</li> </ul>
Revegetation Area Management	<ul style="list-style-type: none"> <li>Revegetation management will follow the guidelines found in the <u>IA Revegetation Plan for RFETS</u> (K-H 2003). Budgets for all projects requiring revegetation should include funding for these efforts. The K-H Ecology Group will be the point of contact for information concerning these issues.</li> </ul>
Immediate Eradication of New Species	<ul style="list-style-type: none"> <li>Any new noxious weed species found on the Site will be controlled immediately to reduce their population and prevent their future increase.</li> </ul>
Prohibition of Undesirable Species	<ul style="list-style-type: none"> <li>A list of species prohibited for use in revegetation seed mixtures is maintained by the K-H Ecology Group, and updated annually or as required. See list below.</li> </ul>