

Appendix A
Red Rock Canyon Zone 2 Multi-use Trail System Project Weed
Management Plan

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**US Department of the Interior
Bureau of Land Management**

**Weed Management Plan
Red Rock Canyon Zone 2 Multi-use Trail System Project**

Red Rock Canyon National Conservation Area
Clark County, Nevada



BLM Southern Nevada District
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1.0 Introduction

Weed control practices for the Red Rock Canyon (RRC) Multi-use Trail System Project as described in this Weed Management Plan have been developed using the following sources:

- Information from Nevada Weed Action Committee in Clark County, Nevada
- US Bureau of Land Management (BLM) Las Vegas and Red Rock Canyon Field Offices in Nevada
- Nevada Revised Statutes: Chapter 555—Control of Insects, Pests and Noxious Weeds
- AlpineEco field surveys conducted in 2010 and 2011

Weeds are “...arbitrarily defined by law as being especially undesirable, troublesome, and difficult to control.”

The structure and contents of this plan are based on the Las Vegas Field Office (LVFO) *Noxious Weed Plan* (BLM 2006). The BLM Project Manager and its construction contractors, in coordination with the local BLM Weed Coordinator, will be responsible for carrying out the methods described in this plan.

1.1 Plan Purpose

The purpose of this plan is to prescribe methods to prevent and control the spread of weeds during and following construction of the RRC Zone 2 Multi-use Trail System Project (proposed trail and trail elements). The *Weed Management Plan* contains specific information on how to treat existing or new weed populations (BLM 2011).

This plan is applicable to the site-specific construction and operation of the proposed RRC Zone 2 Trail System, including the trail alignment, trail right-of-way (footprint), trailheads, steep slopes, wash crossings, outcroppings, structures, areas of extra temporary workspaces (ATWS), and any other areas disturbed during construction.

Section 3.2 of this plan identifies preventive measures that will be implemented along the proposed Zone 2 portion of the RRC trail system and associated trail elements to minimize the spread of weeds during construction.

1.2 Goals and Objectives

The goal of weed control is to implement early detection, containment, and control leading to eradication of weeds during project construction, operations, and maintenance of the RRC Zone 2 Multi-use Trail. Weeds are opportunistic plant species that readily flourish in disturbed areas, thereby preventing native plant species from establishing communities. Monitoring and maintenance during the construction and operational phases will include identification of any local infestations on or adjacent to the RRC Zone 2 Trail System footprint. An evaluation of the efficiency of the prescribed control measures will also be implemented during the operational phase.

The BLM and other Federal, state, and local agencies recognize that some species (for example, cheatgrass [*Bromus tectorum*]) are not considered feasible for general control because of their widespread distribution. In addition, the objective of the RRC Zone 2 Trail System is to prevent the spread of weeds where target species are problematic and form a significant portion of the vegetation community in comparison to adjacent undisturbed areas. Repeated control measures on the RRC Zone 2 Trail System footprint are generally not considered feasible where those species are already established and abundant in the adjacent areas.

1.3 Location

The study area is located in Clark County approximately 4 miles west of the Las Vegas, Nevada, metropolitan area (see **Figure 1 in Zone 2 EA**). It encompasses approximately 201 acres of BLM lands along State Route 159 (SR-159), within the RRCNCA. The site can be found on the La Madre Mountain, Nevada US Geological Survey 7.5minute quadrangle.

The Zone 2 portion of the RRCNCA multi-use trail system is located within Township 21S, Range 58E, Sections 12, 13, 14, and 23, and Township 21S, Range 59E, Section 7. It begins approximately 200 feet south of the Red Rock Canyon Visitor Center or 1.8 miles due west of the Red Rock Canyon Campground.

The study area varies between 3,600 and 3,800 feet above mean sea level (AMSL) and is mostly undeveloped, except for SR-159, the entrance/exit of the Visitor's Center, the Scenic Drive and Exit Lot, and the Red Rock Overlook (the Overlook). It is located near the base of the Sandstone Bluffs, which are part of the Spring Mountains in the Creosote Bush-Dominated Basins of the Mojave Basin and Range Level IV Ecoregion (EPA 2011). Characterized by the presence of scattered shrubs, cacti, and grasses, this ecoregion has historically been used for low carrying capacity rangeland, wildlife habitat, urban development, military bases, recreation, and mining. Pocket mice, kangaroo rats, and the desert tortoise (*Gopherus agassizii*) are faunal indicators of this desert environment (EPA 2011). The study area is typical of the ecoregion.

1.4 Project Description

The BLM is proposing the construction of a multi-use trail system within the RRCNCA. The trail will provide recreational opportunities for a broad range of non-motorized users, such as recreational bicyclists, hikers, runners, and people pushing strollers or walking dogs. The Zone 2 portion of the trail system is about 3 miles in length and expands two trailheads; one for the Scenic Drive Exit Lot (Exit Lot); and the other for the Overlook. Portions of the Project are located in the Nevada Department of Transportation (NDOT) right-of-way along SR-159, including the acceleration and deceleration lanes at the trailheads and a small portion of the Vista Overlook parking lot and trail connection. The remainder of the Project area is located entirely on BLM lands.

The proposed trail would be 10-foot-wide and concrete, with 2-foot-wide unpaved shoulders on both sides. Much of the alignment would be more than 750 feet away from SR-159 and would use existing trails, dirt roads, or utility disturbances wherever possible. This would provide trail users a unique desert experience away from the hazards and nuisances associated with a highway, without extensive additional impacts on the resource associated with new disturbance. At this distance, maintenance and trail monitoring would be manageable because most of the trail could be viewed from the road and would be easily accessible by maintenance vehicles.

This trail system would also include a separate unpaved equestrian trail in areas near SR-159 where equestrians are currently allowed and an identifiable trail is needed. The trail surface will be concrete throughout. Trail alignment engineering and design is focused on resource avoidance.

The trail alignment and associated trail elements include up to 8.25 acres of new permanent disturbance; 28 acres of temporary, construction-related disturbance that would be restored; and the use of nearly 12 acres of previously disturbed land. See **Section 2.1** of the Zone 2 EA for more details.

2.0 Weed Inventory

Discussions with BLM specialists provided a list of weeds known to occur in RRCNCA (BLM 2011). At the present time, no weed list specific to the RRCNCA has been prepared. The RRC Zone 2 Trail System will use the Nevada-listed noxious weeds. Emphasis will be placed on addressing all problem non-native species, not just those listed as “noxious.”

Although none of the Nevada-listed noxious weeds were observed in the study area, three non-native and invasive species were found and should be treated as weeds (BLM 2011). These include compact brome (*Bromus madritensis*), cheatgrass, and prickly Russian thistle (*Salsola tragus*) (AlpineEco 2011). All three of these species are widespread and abundant throughout most of the study area, especially in areas recently burned and/or otherwise disturbed.

2.1 Nevada-listed Noxious Weeds

The State of Nevada maintains an official list of weed species that are designated as noxious species. The local BLM Weed Coordinator will designate additional weed species targeted for control. The Nevada Control of Insects, Pests and Noxious Weeds Act (Nevada Revised Statutes: Chapter 555) grants the Director of the Nevada Department of Agriculture (NDA) the authority to investigate and control noxious weeds, which are defined as plant species that are considered pests by law or regulation (NDA 2011). According to NDA, there are 47 noxious weeds listed for Nevada, as presented in **Table 1**. They are organized into three categories: A, B, and C. Category “A” includes 30 species that are not found or are found in limited distribution in the state and require control in all areas. Category “B” includes nine species that are established in certain areas and only require control in areas where populations are not well established or are previously unknown. Category “C” includes eight species that are generally widespread and control is at the discretion of the state quarantine officer.

Table 1. Designated Noxious Weeds of the State of Nevada

Common Name	Scientific Name
Category A Weeds:	
African rue	<i>Peganum harmala</i>
Austrian fieldcress	<i>Rorippa austriaca</i>
Austrian peaweed	<i>Sphaerophysa salsula</i> / <i>Swainsona salsula</i>
Black henbane	<i>Hyoscyamus niger</i>
Camelthorn	<i>Alhagi camelorum</i>
Common crupina	<i>Crupina vulgaris</i>
Dalmation toadflax	<i>Linaria dalmatica</i>
Dyer’s woad	<i>Isatis tinctoria</i>
Eurasian water-milfoil	<i>Myriophyllum spicatum</i>
Giant reed	<i>Arundo donax</i>
Giant salvinia	<i>Salvinia molesta</i>
Goats rue	<i>Galega officinalis</i>
Green Fountain grass	<i>Pennisetum setaceum</i>
Houndstongue	<i>Cynoglossum officinale</i>
Hydrilla	<i>Hydrilla verticillata</i>
Iberian starthistle	<i>Centaurea iberica</i>

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Common Name	Scientific Name
Klamath weed	<i>Hypericum perforatum</i>
Malta star thistle	<i>Centaurea melitensis</i>
Mayweed chamomile	<i>Anthemis cotula</i>
Mediterranean sage	<i>Salvia aethiopis</i>
Purple loosestrife	<i>Lythrum salicaria, L.virgatum and their cultivars</i>
Purple star thistle	<i>Centaurea calcitrapa</i>
Rush skeletonweed	<i>Chondrilla juncea</i>
Sow thistle	<i>Sonchus arvensis</i>
Spotted knapweed	<i>Centaurea masculosa</i>
Squarrose knapweed	<i>Centaurea virgata</i>
Sulfur cinquefoil	<i>Potentilla recta</i>
Syrian bean caper	<i>Zygophyllum fabago</i>
Yellow Star thistle	<i>Centaurea solstitialis</i>
Yellow toadflax	<i>Linaria vulgaris</i>
Category B Weeds:	
Carolina Horse-nettle	<i>Solanum carolinense</i>
Diffuse knapweed	<i>Centaurea diffusa</i>
Leafy spurge	<i>Euphorbia esula</i>
Medusahead	<i>Taeniatherum caput-medusae</i>
Musk thistle	<i>Carduus nutans</i>
Russian knapweed	<i>Acroptilon repens</i>
Sahara mustard	<i>Brassica tournefortii</i>
Scotch thistle	<i>Onopordum acanthium</i>
White Horse-nettle	<i>Solanum elaeagnifolium</i>
Category C Weeds:	
Canada thistle	<i>Cirsium arvense</i>
Hoary cress	<i>Cardaria draba</i>
Johnson grass	<i>Sorghum halepense</i>
Perennial pepperweed	<i>Lepidium latifolium</i>
Poison hemlock	<i>Conium maculatum</i>
Puncture vine	<i>Tribulus terrestris</i>
Salt cedar (tamarisk)	<i>Tamarix spp</i>
Water hemlock	<i>Cicuta maculata</i>

[Dep't of Agriculture, No. 55.11, eff.5-25-62; A 5-1-68]--(NAC A by St. Quarantine Officer, 8-9-94; R191-99, 8-7-2000; R097-01m 5-1-2002; R003-03, 9-24-2003)

2.2 Weed Assessment

The presence of invasive weeds was noted during field observations. Compact brome is common in about 90 percent of the study area and is especially dense in recently burned or otherwise disturbed areas (including washes). Cheatgrass is common in about 60 percent of the study area and occurs mostly in recently burned areas. Prickly Russian thistle is common in about 30 percent of the study area and occurs mostly in recently burned areas.

The Weed Plan is in compliance with BLM Manual 9015 – Integrated Weed Management.

3.0 Weed Management

The LVFO *Noxious Weed Plan* (BLM 2006) serves as the basis for this *Weed Management Plan*. The strategies and practices set forth in LVFO *Noxious Weed Plan* provide the general requirements (framework) for weed management and control along the proposed Zone 2 portion of the RRC trail system footprint and associated trail elements. Implementation of preventive measures to control the spread of weeds is the most cost-effective management approach.

3.1 Identification of Problem Areas

Prior to construction of the RRC Zone 2 Trail System, contractors will be provided information and training regarding weed management that includes weed identification and resource impacts. The importance of preventing the spread of weeds in areas not infested and controlling the proliferation of weeds already present will be explained. During construction, the RRC Zone 2 Trail System project staff (BLM Project Manager and its construction contractors) will identify and flag areas of concern in the field. The flagging will alert construction personnel and prevent access into areas until weed management control measures have been implemented.

3.2 Preventive Measures

Prior to construction of the Zone 2 Trail System, a weed survey will be performed following the established protocol as described in Appendix 3 of the BLM LVFO *Noxious Weed Plan* (BLM 2006). Ground disturbance will be limited to the minimum area needed for construction in the project site. Requirements related to weeds will be incorporated into construction specifications (for example, cleaning vehicles). In coordination with the local BLM Weed Coordinator, the BLM Project Manager and its construction contractors will implement the following preventive measures to prevent the spread of weeds:

- All contractor vehicles and equipment will be cleaned prior to arrival at the work site using power or high-pressure equipment. The wash down will concentrate on tracks, feet, or tires and on the undercarriage, with special emphasis on axles, frame, cross members, motor mounts, and on underneath steps, running boards, and front bumper/brush guard assemblies. Vehicle cabs will be swept out and refuse will be disposed of in waste receptacles.
- The contractor, with Environmental Inspector (EI) oversight, will ensure that vehicles and equipment are free of soil and debris capable of transporting weed seeds, roots, or rhizomes before the vehicles and equipment are allowed use of temporary construction access roads, trails, trailheads, wash crossings, and ATWS.
- The contractor will clearly mark and flag an area encompassing the Zone 2 portion of the RRC trail system prior to the commencement of any ground disturbance activities. Contractor personnel will limit construction activities to the project site footprint and specific areas required for access. To alleviate the potential conflict of tortoises coming in contact with herbicides, the contractor will erect temporary fencing when applying herbicides or pre-treating areas. The contractor may also consider using flame equipment to burn weeds as an alternative to applying herbicides. This technique is similar to spot spraying that requires no fencing to address chemical issues and is normally successful in treating Sahara mustard and other small weed populations.

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- Contractor personnel will be instructed on how to look for and properly dispose of weed seeds, roots, or rhizomes that are found on clothing and personal equipment (for example, spades, trowels, and so on).
- In areas where infestations are identified or noted in the field, the contractor will stockpile cleared vegetation and salvaged topsoil adjacent to the area from which they are stripped to eliminate the transport of soil-borne weed seeds, roots, or rhizomes.
- During reclamation, the contractor will return topsoil and vegetative material from infestation sites to the areas from which they were stripped. The contractor will use compressed air to remove seeds, roots, and rhizomes from the equipment before transport off site. Cleaning sites will be recorded using GPS equipment and this information will be reported to the local contact person or agency.
- The contractor will ensure that straw or hay bales used for sediment barrier installations or mulch distribution are obtained from state-cleared sources that are free of primary weeds.
- The contractor will implement the reclamation of disturbed lands immediately following construction as outlined in the *Plant Salvage and Restoration Plan* for the RRC Zone 2 Multi-use Trail System Project (provided under separate cover). Continuing revegetation efforts will ensure adequate vegetative cover to prevent the invasion of weeds.
- The contractor will apply fertilizer to reclaimed areas only according to the *RRC Zone 2 Multi-use Trail System Plant Salvage and Restoration Plan* and as directed by the BLM.

3.3 Treatment Methods

The RRC Zone 2 Study Corridor will implement weed control measures that will be in accordance with existing regulations and BLM requirements. Before construction, only herbicides that are approved by the local BLM Weed Coordinator will be applied to the identified weed infestations on BLM lands to reduce the spread or proliferation of weeds. Post-construction control measures may include one or more of the following methods:

- Treatment methods will be based on species-specific and area-specific conditions (for example, proximity to water or riparian areas, or agricultural areas, and time of year) and will be coordinated with the BLM Project Manager. If areas are not seeded until the following spring because of weather or scheduling constraints, all annuals and undesirable vegetation that have become established will be eradicated before seeding. There is also the potential to use a pre-emergent herbicide prior to construction.
- Mechanical methods that rely on equipment to mow or disc weed populations should be avoided in favor of hand spreader methods for reseeding in the project area due to the existing ecoregion and desert landscape. Whichever method is used, subsequent seeding will be conducted to re-establish a desirable vegetative cover that will stabilize the soils and slow the potential re-invasion of weeds.
- Disking or other mechanical treatments that would disturb the soil surface within native habitats will be avoided; instead, an herbicide application will be used as an effective means of reducing the size of weed populations. Another alternative is to use flame equipment to burn weeds. Weeds can be pulled out or removed by hand in small areas.
- Seed selection will be based on site-specific conditions and the appropriate seed mix identified for those conditions. Prior BLM approval is required for any seed mix used in the project area. Details are provided in the *RRC Zone 2 Multi-use Trail System Plant Salvage and Restoration Plan*.

- Herbicide application will be controlled, as described in **Section 5.1**, to minimize the impacts on the surrounding vegetation. In areas of dense infestation, a broader application will be used and a follow-up seeding program implemented.
- Supplemental seeding will be based on the criteria set forth in the *RRC Zone 2 Multi-use Trail System Plant Salvage and Restoration Plan* in coordination with the BLM.
- The timing of subsequent re-vegetation efforts will be based on the shelf life of the selected herbicide.
- The schedule for the RRC Zone 2 Multi-use Trail System includes restoration and re-vegetation within five to seven years.

3.4 Agency-Specific Requirements

NRS Chapter 555 grants the Director of the Nevada Department of Agriculture (NDA) the authority to regulate and control noxious weeds (NDA 2011). Implementation of the *Weed Management Plan* for the RRC Zone 2 Multi-use Trail System Project, in coordination with the local BLM Weed Coordinator, the BLM Project Manager, and its construction contractors, will ensure compliance with NRS Chapter 555.

3.4.1 Bureau of Land Management Lands

The *Final Programmatic Environmental Impact Statement on Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States Record of Decision* (USDI 2007a and USDI 2007b) lists 18 herbicides acceptable for use on BLM lands. **Table 2** lists the approved herbicides for Nevada.

Table 2. Herbicide Active Ingredients Approved for Use on Public Lands in Nevada

Chemical	
2,4-D	Glyphosate
Bromacil	Hexazinone
Chlorsulfuron	Imazapic
Clopyralid	Imazapyr
Dicamba	Metsulfuron methyl
Diflufenzopyr + dicamba	Picloram
Diquat	Sulfometuron methyl
Diuron	Tebuthiuron
Fluridone	Triclopyr

Note: Based on the current EISs, these herbicide active ingredients have been analyzed and approved for application on BLM-administered lands.

Prior to construction, the BLM will provide a specific list of herbicides for use on the RRC Zone 2 Multi-use Trail System Project based on **Table 2**. Guidelines for the use of chemical control of vegetation on BLM lands are presented in the *BLM Handbook H-9011-1 – Chemical Pest Control*. These guidelines require the submittal of Pesticide Use Proposals (PUPs) and Pesticide Application Records (PARs) for the use of herbicides on BLM lands as described in Appendix 12 of the *BLM LVFO Noxious Weed Plan* (BLM 2006).

The occurrence of weeds within the Zone 2 portion of the RRC trail system footprint and associated trail elements will be reported to the BLM district office where the weeds occur. The appropriate weed control procedures, including target species, timing of control, and method of control, will be determined in consultation with BLM personnel.

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The Weed Plan is in compliance with *BLM Manual 9014 – Use of Biological Control Agents of Pests on Public Lands*.

3.5 Qualifications of Weed Management Plan Administrator

The local BLM Weed Coordinator has the authority to review and approve the qualifications of the personnel/contractor who will be responsible for implementing the weed control procedures described in the *Weed Management Plan*. The BLM has the right to expect and ask for competent personnel. If work proceeds poorly, the BLM can demand personnel change.

4.0 Monitoring

Weed monitoring will occur quarterly to encompass the various growing seasons and help detect both infestations and treatment effectiveness. Monitoring will continue for one year following completion of trail construction. Weed monitoring of the trail and trail elements will be conducted on an ongoing basis in addition to a “schedule” of quarterly or biannual weed surveys. The BLM will also conduct annual site visits to monitor known infestation areas in the project area. These areas will be evaluated and controlled. The local BLM Weed Coordinator will continue to visit these infestation areas on an ongoing basis or until weeds in the area are controlled.

5.0 Herbicide Application, Handling, Spills, and Cleanup

The LVFO *Noxious Weed Plan* (BLM 2006) provides guidance in this *Weed Management Plan* for herbicide application and handling; herbicide spills and cleanup; and worker safety and spill reporting.

5.1 Herbicide Application and Handling

Herbicide application for the RRC Zone 2 Multi-use Trail System Project will be based on information gathered from the BLM. Before application, the Nevada-licensed contractor will obtain any required permits and approvals from the local authorities (the BLM Weed Coordinator). Permits may contain additional terms and conditions that go beyond the scope of this management plan.

Furthermore, there are restrictions associated with spraying herbicides in desert tortoise habitat. If weed populations require spraying, the Zone 2 EA study area will have to be fenced off to keep the tortoises out. **Fencing will be permanent and located x?? amount of feet from the trail footprint.**

A Nevada-licensed contractor will perform the application in accordance with applicable laws and regulations and permit stipulations. All herbicide applications must follow US Environmental Protection Agency label instructions. Application of herbicides will be suspended when any of the following conditions exists:

- Wind velocity exceeds 6 miles per hour (mph) during application of liquids
- Wind velocity exceeds 15 mph during application of granular herbicides
- Snow or ice covers the foliage of weeds
- Precipitation is occurring or is imminent

Vehicle-mounted sprayers (for example, handgun, boom, and injector) will be used mainly in open areas that are readily accessible by vehicle. Hand application methods (for example, backpack spraying) that target individual plants will be used to treat small or scattered weed populations in rough terrain. Calibration checks of equipment will be conducted at the beginning of spraying and periodically to ensure

that proper application rates are achieved. Herbicides will be transported to the project site daily with the following provisions:

- Only the quantity needed for that day's work will be transported.
- Concentrate will be transported in approved containers only and in a manner that will prevent tipping or spilling, and in a location that is isolated from the vehicle's driving compartment, food, clothing, and safety equipment.
- Mixing will be done offsite, over a drip catching device, and at a distance greater than 200 feet from open or flowing water, wetlands, or other sensitive resources. No herbicides will be applied at these areas unless authorized by appropriate regulatory agencies.
- All herbicide equipment and containers will be inspected for leaks daily.
- Disposal of spent containers will be in accordance with herbicide labels.

5.2 Herbicide Spills and Cleanup

All reasonable precautions will be taken to avoid herbicide spills. In the event of a spill, cleanup will be immediate and contractors will follow cleanup instructions in accordance with herbicide labels.

Contractors will keep spill kits in their vehicles and in herbicide storage areas to allow for quick and effective response to spills. The following items are included in the spill kit:

- Protective clothing and gloves (PPE)
- Absorbent clay, "kitty litter," or other commercial adsorbents
- Plastic bags and a bucket
- Shovel
- Fiber brush and screw-in handle
- Dust pan
- Caution tape
- Highway flares (use on established roads only)
- Detergent

The response to an herbicide spill will vary with the size and location of the spill, but general procedures include:

- Notifying the BLM
- Setting up traffic control
- Dressing the clean-up team in protective clothing
- Stopping the leaks
- Containing the spilled material
- Cleaning up and removing the spilled herbicide and contaminated adsorbent material and soil
- Transporting the spilled pesticide and contaminated material to an authorized disposal site

5.3 Worker Safety and Spill Reporting

All herbicide contractors will be state certified to apply pesticides and obtain and have readily available copies of the appropriate material safety data sheets for the herbicides used. All herbicide spills will be reported in accordance with applicable laws and requirements.

6.0 Best Management Practices (BMPs)/Mitigation Measures

Discussions with BLM specialists (BLM 2011) provided a list of BMPs or standard mitigation protocols that will be employed during the lifetime of this project as described in Appendices 7 and 8 of the BLM LVFO *Noxious Weed Plan* (BLM 2006).

7.0 Literature Cited

7.1 Regulations, Orders, Laws

BLM Handbook H-9011-1 – Chemical Pest Control

BLM Manual 9014 – Use of Biological Control Agents of Pests on Public Lands

BLM Manual 9015 – Integrated Weed Management

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