

WYMAN GRAVEL PIT
ROUTT COUNTY, COLORADO
Prepared by Routt County Weed Program
August, 2016

Gravel Pit Noxious Weed Management Plan

Introduction

Noxious weeds are invasive plants that are not native to North America and as a consequence have inadequate or absent insect predators or plant pathogens to keep them controlled. They pose a serious threat to native plant populations, agriculture, wildlife, and property values. The State of Colorado and Routt County require noxious weed management on public and private land.

In order to be in compliance with the Colorado Noxious Weed Act, Routt County regulations, and the terms and conditions of the gravel mining permit for this property, the following named plants must be controlled. Any weeds on the County or State Noxious weed lists not named below but detected after this plan is written shall also be controlled. (See appendix B and C.)

The following noxious weeds are subject to management requirements, according to the Routt County Weed Plan or the Colorado noxious weed act of 2003.

Routt County Weed List:

- ☒ white top (*Cardaria draba*)
- ☒ houndstongue (*Cynoglossum officianale*)
- ☐ spotted knapweed (*Centaurea maculosa*)
- ☐ diffuse knapweed (*Centaurea diffusa*)
- ☐ Russian knapweed (*Centaurea repens*)
- ☐ meadow knapweed (*Centaurea pratensis*)
- ☐ leafy spurge (*Euphorbia esula*)
- ☐ Cypress spurge (*Euphorbia cyparrissias*)
- ☐ myrtle spurge (*Euphorbia myrsinites*)
- ☐ yellow toadflax (*Linaria vulgaris*)
- ☒ Dalmatian toadflax (*Linaria genistifolia*)
- ☐ orange hawkweed (*Hieracium aurantiacum*)
- ☐ purple loosestrife (*Lythrum saltcaria*)

from the State Weed List:

- ☐ oxeye daisy (*Chrysanthemum leucanthemum*)
 - ☒ Canada thistle (*Cirsium arvense*)
 - ☒ bull thistle (*Cirsium vulgare*)
 - ☐ Scotch thistle (*Onopordum acanthium*)
 - ☒ musk thistle (*Carduus nutans*)
 - ☐ cheatgrass (*Bromus tectorum*)
 - ☒ Mountain tarweed (*Madia glomerata*)
 - ☒ Common mullein (*Verbascum Thapsus*)
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Management Recommendations

Gravel pits are unique sites with special weed management considerations. They are continually disturbed and material is regularly hauled off-site. This necessitates different weed management goals than on other types of property. **It is essential that weeds, including weed seeds, are not spread from this quarry to other areas**, and that is the primary goal of good weed control at this site. This requires an aggressive weed control program.

There are four main stages to weed control at this quarry: detection, prevention, treatment, and monitoring.

Detection of noxious weed species begins with a survey of the site prior to disturbance. Further detection of new weed species is essential, and the property owner shall continually monitor the property for them. Of particular concern are those weeds on the County and the State noxious weed lists.

Prevention is a key component of this plan. Those areas that are being reclaimed shall be re-seeded as soon as possible (and in accordance with any other permits) with a weed-free mix composed primarily of grasses. (Appendix A provides potentially appropriate seed mixes, and the local County Extension Agent can help develop any mixes in the future.) If any hay is used in the reclamation process **State Certified Weed Free Hay** shall be used. Seeding is best accomplished in the fall or with a hydro-mulcher. Any topsoil sold as a part of the permit shall be weed free to prevent weeds from spreading throughout Routt County.

Treatment of noxious weeds varies by the severity of the infestation, the biology of the plant, location, time, and money. Biological, chemical, mechanical, and cultural controls are all important, and to maximize control it is best if more than one method is employed on each weed infestation. Specific treatments are outlined below.

Monitoring of the property for the existence of any new noxious weeds and to determine the effectiveness of controls already applied is a very important aspect of weed management. Early detection and control of noxious weeds will save money and time in the long run. Throughout the growing season this property shall be carefully monitored for the start of any new noxious weed populations. The overall property shall be scouted at least once a year and examined for the start of any weed problems. It is up to the permit holder to become familiar with the weeds on the County and State noxious weed list. Contact the Routt County Weed Program with questions about weed species and suggested treatments.

Specific Treatments

All herbicide recommendations contained herein are for general management purposes only, and are in no way meant to replace or supersede any information contained on the herbicide label. Herbicide labels and recommended rates change, and an applicator must read the label to see if the following recommendations are still within labeled parameters. **The herbicide label is the law** and any deviation from the instructions on the label constitutes a violation of the law.

White top (*Cardaria draba*) is also known as hoary cress. It is a perennial, producing by seeds and rhizomes. It does not respond well to mechanical means of control such as cutting, digging pulling or mowing. Like other aggressive, rhizomatous perennials herbicides offer the only long term control. The premier herbicides for control of whitetop are in the sulfonyleurea group of herbicides and include Escort at 1.5 oz/acre or Telar at 1 oz/acre. The application needs to be made early in the season, preferably prior to full flowering, but absolutely before any fading of color is detected in the blossoms. In the spring, when plants are actively growing, it responds well to 3/4 oz. Escort + 16 oz. 2,4-D amine per acre. Sixteen oz. of Banvel + 16 oz. 2,4-D amine per acre is less effective but still acceptable. Be sure and use a good quality surfactant with these mixes. The best treatment we have found is 1 oz. of Telar mixed with 32 oz. of MCPA, applied in 15-30 gal of water / acre in the spring just as blossoms form.

Dalmatian and yellow toadflax (*Linaria genistifolia* and *dalmatica* L.) and (*Linaria vulgaris*) are perennials, spreading both by root shoots and seed production. They are very aggressive, forming thick mono-cultures where allowed to grow unimpeded. They are difficult to control due to their extensive root and rhizome system, and in the case of Dalmatian toadflax, a waxy cuticle. Repeated treatments will most likely be necessary before they show any significant improvement. Spray with 1 quart per acre of Tordon or 1 quart of Banvel with a quart of 2,4-D amine per acre. Telar and Perspective also provide good control. Round-up is also effective in those areas where grass loss can be tolerated. Surfactant must be used whenever spraying either toadflax.

Spotted knapweed (*Centaurea maculosa*) and diffuse knapweed (*Centaurea diffusa*) are biennial or short-lived perennial plants. They spread solely by seed production, but can quickly dominate an area. Neither plant is very widespread in Routt County, and when found shall be treated aggressively to prevent their establishment. Milestone is the most effective herbicide available for controlling the knapweeds. Tordon at 24 oz. per acre provides the very good control, but Curtail at 32 oz. per acre or Banvel at 24 oz per acre also work well. Remember, Tordon is a **Restricted Use** herbicide, requiring a pesticide applicators license from the Colorado Department of Agriculture and tordon persists in the environment for a very long time.

Russian knapweed (*Centaurea repens*) is a perennial producing by seeds and roots. Best control is achieved by spraying in the spring or fall with 5-7 oz/acre of Milestone. Use a non-ionic surfactant. Another herbicide control is to spray in the spring or fall with 16 oz Tordon + 32 oz. 2,4-D amine per acre with a good quality surfactant. Curtail also provides good control at 1 quart per acre.

Leafy spurge (*Euphorbia esula*) is a deep rooted perennial, reproducing by seeds, rhizomes and roots. It is one of the most economically and environmentally damaging plants in the West. **It is very difficult to control.** In the spring spray it with 1 quart of Tordon + 1 quart of 2,4-D amine per acre, or 1 quart of Banvel with 1 quart of 2,4-D amine per acre. Twelve oz of Plateau + methylated seed oil shows good control, but must be sprayed in the fall. As it is essential that no seeds be removed from any site where leafy spurge occurs, this would not provide acceptable control unless the spurge was mowed or grazed to prevent it from going to seed in the summer. Very specific site considerations must be evaluated before treating leafy spurge on riparian sites and it is wise to contact the Routt County Weed Program with any questions regarding herbicide use close to water or in areas with a high water table.

Oxeye daisy (*Chrysanthemum leucanthemum*) is an escaped ornamental, perennial, with shallow roots. It spreads by seed and roots. Due to its shallow root system it is readily controlled with cultivation or ripping. It is shade intolerant, and good grass cover helps prevent its establishment. Milestone at 5 oz/acre is a very effective control. Treating a field with 24 oz Tordon or 3/4 oz. Escort (plus surfactant) per acre provides excellent control as well.

Houndstongue (*Cynoglossum officinale*) is a biennial and very toxic to livestock, especially horses. It causes irreversible liver damage and is an accumulative poison. Early signs of poisoning in horses may include photosensitivity and blistering and peeling of skin on the nose and lips. It forms a low growing rosette the first year and the second year bolts up to 1-2 feet tall, forming rosy-purple flowers followed by a large, flat seed that sticks to almost anything with Velcro-like hooks. It can be controlled with herbicides or by cutting the roots at least 4 inches below the surface with a shovel once it has bolted. Escort at 1.5 oz/acre or Telar at 1 oz/acre, especially if mixed with 1 qt 2,4-D/acre results in very good control. Use a non-ionic surfactant. Tordon or Banvel at 24 oz. per acre, or 2, 4-D amine at 1 quart per acre and a good quality surfactant all provide good control. Spring or fall treatments are best.

Canada thistle (*Cirsium arvense*) is a deep rooted perennial that reproduces both vegetatively and by seed. It forms dense stands, usually reaching a height of 2 to 4 feet with small bluish-purple flowers. It readily appears throughout the County whenever the ground is disturbed. Milestone at 5 oz/acre for young plants or 7 oz/acre for well established infestations is the best treatment available. Spring and fall applications are both effective. Spray it in the spring with 1 quart of Tordon, Banvel or Curtail per acre. It is especially helpful with Canada thistle to re-seed any areas that are disturbed with a good grass mix. Fall applications work well, especially if the plants are mowed in the summer.

Musk thistle (*Carduus nutans*) is a biennial, which reproduces from seed. The first year's growth is a large, compact rosette. Individual plants are effectively controlled with a shovel. The second year the plant bolts, growing to a height of two to six feet, with large spiny leaves with a deep green color. Flowers are large, nodding and purple. A biennial, musk thistle responds well to mechanical control and can be either disked or mowed. Musk thistle also responds well to herbicide control: Milestone at 5-7oz/acre is very effective on musk thistle. Escort at 3/4 oz per acre; 2,4-D amine at 1 quart per acre; Banvel or Tordon at 1.5 pints per acre; Curtail at 1 quart per acre.

Bull thistle (*Cirsium vulgare*) and Scotch thistle (*Onopordum acanthium*) are biennials, and can be treated the same as musk thistle. These weeds are also best controlled with Milestone at 5-7oz/acre, applied in late summer-early fall on first year rosettes or early in the season of the second year before rosettes bolt.

Cheatgrass (*Bromus tectorum*) and Downy brome (*Bromus secalinus*) are highly invasive annual or winter annual grasses, and are the subject of considerable research on effective controls due to their impact on Great Basin rangelands. Aminocyclopyrachlor as Matrix has been found to be effective when applied according to specific label directions. Roundup (glyphosate), Journey, Plateau, and Landmarke may also be effective when used according to label directions. Glyphosate at 10 oz. / acre will control cheatgrass without doing lasting damage to cool season perennial grasses more economically than other treatments.

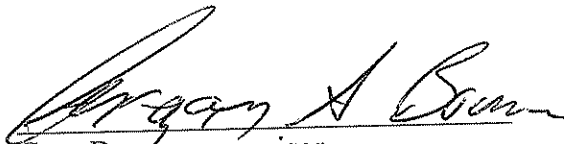
Tarweed (*Madia glomerata*) is a broadleaf annual. It can be controlled by either using Round-up, where grass loss can be tolerated, or disked before flowering. Because tarweed is an annual and prevention of seed production is the primary goal, an application of 2 qts/acre of 2,4-D 4 lb amine can effectively dessicate the weed and prevent seed maturity. Tarweed can be controlled with Escort at 3/4 oz per acre with a good surfactant. This weed will typically disappear once good grass cover is established.

Common mullein (*Verbascum Thapsus*) is biennial C List noxious weed in Colorado most typically occurring on disturbed sites. If the plants are few in number a shovel is a great tool for control and loppers or pruners can be used to remove flower spikes before seed is mature. Herbicide control is more difficult because of the extremely hairy surface. Good control can be achieved with Perspective at 5 oz. / acre applied in adequate water to thoroughly wet the leaf surface (30 gal. / acre). A crop oil surfactant works better than non-ionic surfactants to help penetrate the wooly leaf surface. Spraying should be done in the fall on first year rosettes or in spring just as the rosettes begin to bolt.

Other Noxious Weeds not listed here: Glyphosate (Roundup) is often, but not always effective when treating individual plants or when loss of grass is not a problem. The Routt County Weed Supervisor will work with the permit holder to develop specific control measures needed to control any noxious weeds found in the future on this property but not described here.

Conclusion

Noxious weed management is essential at gravel pits within Routt County and required under the law. If done regularly proper management techniques should keep a continually disturbed site like a quarry from being a source of weeds to other areas, and not be overly costly. Failure to control the weeds at this site could result in loss of the Special Use Permit for the gravel operation or enforcement of the State Noxious Weed Act on the property owner. The County shall retain the right to inspect for noxious weeds at this site to insure adequate weed control is occurring.


Greg Brown, supervisor
Routt County Weed Program

Aug. 29, 2016
Date

Permitee
President

Date

Appendix A

Economy Dryland Pasture Mix

Good for dry sites on marginal soils. Seed at 10 to 15 lb./acre. Seed at 10 to 15 lb./acre.

15% Orchardgrass, Paiute	15% Dahurian Wildrye
15% Smooth Brome, Lincoln	15% Perennial Rygrass (tetraploid)
15% Crested Wheatgrass, Nordan	10% Crested Wheatgrass, Hycrest
15% Intermediate Wheatgrass	

Mountain Meadow Mix

A mix for pasture and hay on moist sites at higher altitudes: Seed at 25 to 40 lb./acre

30% oats, VNS	10% Annual Ryegrass
25% Orchardgrass	5% Alsike Clover
25% Smooth Brome	5% Timothy

Low Grow High Altitude Mix: Seed at 5 to 10 lbs per 1000 sq. ft.

A mix more like traditional lawns, useful to provide quick, low maintenance cover.
Works well at higher elevations near homes.

30% Crested Wheatgrass, Ephraim	20% Sheep Fescue
25% Perennial Ryegrass, lowgro	15% Canada blue bluegrass
10% Chewings Fescue	

Appendix B

County Noxious Weeds

Routt County's "designated noxious weeds". Their control is mandatory on public and private lands in the county.

- ☐ white top (*Cardaria draba*)
- ☐ houndstongue (*Cynoglossum officinale*)
- ☐ spotted knapweed (*Centaurea maculosa*)
- ☐ diffuse knapweed (*Centaurea diffusa*)
- ☐ Russian knapweed (*Centaurea repens*)
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- ☐ leafy spurge (*Euphorbia esula*)
- ☐ Cypress spurge (*Euphorbia cyparissias*)
- ☐ myrtle spurge (*Euphorbia myrsinites*)
- ☐ yellow toadflax (*Linaria vulgaris*)
- ☐ Dalmatian toadflax (*Linaria genistifolia*)
- ☐ orange hawkweed (*Hieracium aurantiacum*)
- ☐ purple loosestrife (*Lythrum salicaria*)

Appendix C

State Noxious Weeds

Routt County's "weeds of concern". Their control is strongly encouraged by all landowners in the county. Those in **bold** are known to be problems in the county.

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| 1. Absinth wormwood | <i>Artemisia absinthium</i> |
| 2. African rue | <i>Peganum harmala</i> |
| 3. Black henbane | <i>Hyoscyamus niger</i> |
| 4. Black nighshade | <i>Solanum nigrum</i> |
| 5. Blue mustard | <i>Chorisporea tenella</i> |
| 6. Bouncingbet | <i>Saponaria officinalis</i> |
| 7. Bull thistle | <i>Cirsium vulgare</i> |
| 8. Camelthorn | <i>Alhagi pseudalhagi</i> |
| 9. Canada thistle | <i>Cirsium arvense</i> |
| 10. Chicory | <i>Cichorium intybus</i> |
| 11. Chinese clematis | <i>Clematis orientalis</i> |
| 12. Tarweed, mountain or coastal | <i>Madia glomerata or sativa</i> |
| 13. Common burdock | <i>Arctium minus</i> |
| 14. Common crupina | <i>Crupina vulgaris</i> |
| 15. Common groundsel | <i>Senecio vulgaris</i> |
| 16. Common mullein | <i>Verbascum thapsus</i> |
| 17. Common St. Johnswort | <i>Hypericum perforatum</i> |
| 18. Common tansy | <i>Tanacetum vulgare</i> |
| 19. Common teasel | <i>Dipsacus fullonum</i> |
| 20. Cypress spurge | <i>Euphorbia cyparissias</i> |
| 21. Dame's rocket | <i>Hesperis matronalis</i> |
| 22. Downy brome | <i>Bromus tectorum</i> |
| 23. Dyer's woad | <i>Isatis tinctoria</i> |
| 24. Eurasian watermilfoil | <i>Myriophyllum spicatum</i> |
| 25. Field bindweed | <i>Convolvulus arvensis</i> |
| 26. Flixweed | <i>Descurainia sophia</i> |
| 27. Giant salvinia | <i>Salvinia molesta</i> |
| 28. Green foxtail | <i>Setaria viridis</i> |
| 29. Hairy nightshade | <i>Solanum sarrachoides</i> |
| 30. Halogeton | <i>Halogeton glomeratus</i> |
| 31. Houndstongue | <i>Cynoglossum officinale</i> |
| 32. Hydrilla | <i>Hydrilla hydrilla</i> |
| 33. Johnson grass | <i>Sorghum halepense</i> |
| 34. Jointed goatgrass | <i>Aegilops cylindrical</i> |
| 35. Kochia | <i>Kochia scoparia</i> |
| 36. Mayweed chamomile | <i>Anthemis cotula</i> |
| 37. Mediterranean sage | <i>Salvia aethiopis</i> |
| 38. Medusahead rye | <i>Taeniatherum caput-medusae</i> |
| 39. Moth mullein | <i>Verbascum blattaria</i> |
| 40. Musk thistle | <i>Carduus nutans</i> |
| 41. Myrtle spurge | <i>Euphorbia myrsinites</i> |

Appendix C Continued

- 42. Orange hawkweed
- 43. Oxeye daisy**
- 44. Perennial pepperweed
- 45. Perennial sowthistle
- 46. Plumeless thistle
- 47. Poison hemlock**
- 48. Puncturevine
- 49. Purple loosestrife
- 50. Quackgrass
- 51. Redstem filaree
- 52. Rush skeletonweed
- 53. Russian olive
- 54. Russian thistle
- 55. Saltcedar
- 56. Scentless chamomile
- 57. Scotch thistle
- 58. Sericea lespedeza
- 59. Shepherdspurse
- 60. Spurred anoda
- 61. Squarrose knapweed
- 62. Sulfur cinquefoil
- 63. Swainsonpea
- 64. Tansy ragwort
- 65. Velvetleaf
- 66. Venice mallow
- 67. Wild caraway**
- 68. Wild mustard
- 69. Wild oats**
- 70. Wild proso millet
- 71. Yellow foxtail
- 72. Yellow nutsedge
- 73. Yellow starthistle

Hieracium aurantiacum
Chrysanthemum leucanthemum
Lepidium latifolium
Sonchus arvensis
Carduus acanthoides
Conium maculatum
Tribulus terrestris
Lythrum salicaria
Elytrigia repens
Erodium cicutarium
Chondrilla juncea
Elaeagnus angustifolia
Salsola collina & iberica
Tamarix parviflora & ramosissima
Anthemis arvensis
Onopordum acanthium & tauricum
Lespedeza cuneata
Capsella bursa-pastoris
Anoda cristata
Cenaurea virgata
Potentilla recta
Sphaerophysa salsula
Senecio jacobaea
Abutilon theophrasti
Hibiscus trionum
Carum carvi
Brassica kaber
Avena fatua
Panicum miliaceum
Setaria glauca
Cyperus esculentus
Centaurea solstitialis