

**MESA COUNTY**

**NOXIOUS WEED MANAGEMENT**  
**PLAN**

**Division of Pest Management**

**Judith M. Sirota**  
**Weed and Pest Inspector**

**Adopted November 30, 2009**  
**MCM 2009-204**

# TABLE OF CONTENTS

|   |    |
|---|----|
| Definitions .....   | 4  |
| <b>1.0 Authority: Colorado Weed Management Act (Act): C.R.S. Title 35, Article 5.5</b> .....              | 8  |
| <b>1.1 Purpose of C.R.S. Title 35, Article 5.5</b> .....  | 8  |
| <b>1.2 An Abstract</b> .....  | 8  |
| <b>1.2.1 County Noxious Weed Management Plan and Noxious Weed Advisory Board</b> .....                    | 8  |
| <b>1.2.2 Coordination of Effort and Designation of List A, B and C Noxious Weeds</b> .....                | 8  |
| <b>1.2.3 Procedure for Eradication of List A and List B Species</b> .....                                 | 9  |
| <b>1.2.4 Procedure for Management of Species not Designated for Eradication</b> .....                     | 10 |
| <b>1.2.5 Nuisance Declaration, Interagency Agreements and Funding</b> .....                               | 11 |
| <b>1.3 Noxious Weed Lists</b> .....   | 11 |
| <b>2.0 Goals and Objectives for Noxious Weed Management In Mesa County</b> .....                          | 15 |
| <b>3.0 Operating Procedures for the Division of Pest Management and the Pest and Weed Inspector</b> ..... | 15 |
| <b>3.1 Prioritizing County Weed Management Efforts</b> .....  | 15 |
| <b>3.1.1 High Priority</b> .....  | 16 |
| <b>3.1.2 Medium Priority</b> .....  | 16 |
| <b>3.1.3 Low Priority</b> .....   | 17 |
| <b>3.2 Coordination of weed management activities</b> .....   | 17 |
| <b>3.2.1 Non-county entities</b> .....  | 17 |
| <b>3.2.2 County Departments and Divisions</b> .....   | 18 |
| <b>3.3 Mapping</b> .....  | 18 |
| <b>3.3.1 Roads</b> .....  | 18 |
| <b>3.3.2 Other County Properties</b> .....  | 18 |
| <b>3.3.3 Private property</b> .....   | 18 |
| <b>3.4 Education</b> .....  | 19 |
| <b>3.5 Management of Noxious Weeds on Private Property</b> .....  | 19 |
| <b>3.5.1 Landowner Cooperation</b> .....  | 19 |
| <b>3.5.2 Priorities for Implementing Enforcement Action</b> .....   | 20 |
| <b>3.5.3 Standard Operating Procedures for Enforcement</b> .....  | 20 |
| <b>3.5.3.1 Responsibility</b> .....   | 20 |
| <b>3.5.3.2 Requests For Assistance</b> .....  | 21 |
| <b>3.5.3.3 Complaints</b> .....   | 21 |
| <b>3.5.3.3.1 Inspection</b> .....   | 21 |
| <b>3.5.3.3.2 Notification</b> .....   | 22 |
| <b>3.5.3.3.3 Enforcement Notice</b> .....   | 22 |
| <b>3.5.3.3.4 Enforcement</b> .....  | 23 |
| <b>3.5.3.3.5 Billing</b> .....  | 23 |
| <b>3.5.4 Mesa County Noxious Weed Cost Share Program</b> .....  | 24 |
| <b>3.5.4.1 Application Process</b> .....  | 24 |
| <b>3.5.4.2 Eligibility</b> .....  | 24 |
| <b>3.5.4.3 Reimbursement</b> .....  | 24 |
| <b>3.5.4.4 Reasons For Disqualification or Denial</b> .....   | 25 |
| <b>3.6 Herbicide Application on Private Land</b> .....  | 25 |
| <b>3.7 Funding of Weed Management Projects</b> .....  | 26 |
| <b>APPENDICES</b> .....   | 27 |
| <b>APPENDIX A—A Guide to Integrated Weed Management Planning</b> .....                                    | 28 |
| <b>A1 Identification</b> .....  | 28 |
| <b>A2 Mapping</b> .....   | 28 |
| <b>A3 Evaluation of Control Strategy</b> .....  | 28 |
| <b>A4 Preparing an Integrated Weed Management Plan</b> .....  | 29 |
| <b>A5 Weed Control Principles</b> .....   | 29 |
| <b>APPENDIX B—Best Management Practices for Noxious Weeds in Mesa County</b> .....                        | 31 |
| <b>B1 General Guidelines</b> .....  | 31 |

|  |           |
|--|-----------|
| <b>B2 Control of Annuals &amp; Biennials .....</b>               | <b>32</b> |
| <b>B3 Control of Perennials .....</b>                            | <b>32</b> |
| <b>B4 Integrated Pest Management Practices .....</b>             | <b>33</b> |
| <b>B4.1 Prevention.....</b>                                      | <b>33</b> |
| <b>B4.2 Cultural Practices .....</b>                             | <b>34</b> |
| <b>B4.3 Mechanical Control .....</b>                             | <b>34</b> |
| <b>B4.4 Biological Control .....</b>                             | <b>35</b> |
| <b>B4.5 Chemical Control.....</b>                                | <b>36</b> |
| <b>B5 Noxious Weeds of Mesa County: A Management Guide .....</b> | <b>36</b> |

## List of Tables

|  |           |
|--|-----------|
| <b><i>TABLE 1: COUNTY LISTED NOXIOUS WEEDS .....</i></b>                           | <b>13</b> |
| <b><i>TABLE 2: STATE LISTED NOXIOUS WEEDS TO BE ERADICATED STATEWIDE .....</i></b> | <b>14</b> |

## Definitions

1. **Act:** the Colorado Weed Management Act, Title 35, Article 5.5, Colorado Revised Statutes (C.R.S.) as amended.
2. **Alien plant:** an introduced plant species that is not native to the state of Colorado.
3. **Annual weed:** a weed that lives for one year then dies. Seeds are the primary dispersal mechanism for annual plants.
4. **Arbitration panel:** In an enforcement situation involving noxious weeds that are not slated for eradication, a landowner may request an arbitration panel to determine a management plan for the landowner's infested property. The arbitration panel is chosen by the local governing body and "shall be comprised of a weed management specialist or weed scientist, a landowner of similar land in the same county, and a third panel member chosen by agreement of the first two panel members." (CRS 35-5.5-109(4)(b)).
5. **Authorized Agent:** a local or state government employee or designated inspector.
6. **Best Management Practices (BMP):** recommendations for the most reasonable, effective and economical but least harmful methods of weed control; may include prevention, mechanical, cultural, biological and chemical methods .
7. **Biennial weed:** a weed that has a two year life cycle. It germinates and grows leaves one year, then sends up a flower stalk and sets seed the following year. Seeds are the primary dispersal mechanism for biennial plants.
8. **Biological Control:** The deliberate introduction of living agents (natural enemies), such as insects, vertebrate predators, grazing animals, and plant diseases, to reduce the population of a pest.
9. **Biocontrol agent:** a living creature that is used to control undesirable pests. Includes insects, diseases, and vertebrate animals, among others.
10. **Board:** County Noxious Weed Advisory Board (NWAB).
11. **Board of Commissioners (BOCC):** Mesa County Board of Commissioners.
12. **Bolting:** a stage in the life cycle of a plant when it sends up a flower stalk.
13. **CDOT:** Colorado Department of Transportation.
14. **Commissioner:** the Colorado Commissioner of Agriculture.
15. **Containment:** "...maintaining an intensively managed buffer zone that separates infested regions, where suppression activities prevail, from largely uninfested regions, where eradication activities prevail." (CRS 35-5.5-103(11.7)(b)).

- 16. County:** the unincorporated areas of Mesa County.
- 17. Cultural Weed Control:** Cultural control means using sensible land management practices, such as dense seeding with competitive species, crop rotation, careful irrigation practices, proper fertilization, and sensible grazing regimes.
- 18. Division:** the Mesa County Division of Pest Management.
- 19. Elimination:** removing and destroying live plants of List A or List B species designated for eradication and preventing seed production until the seed source is depleted; considered the first step in the eradication process.
- 20. Eradication:** "...reducing the reproductive success of a noxious weed species or specified noxious weed population in largely uninfested regions to zero and permanently eliminating the species or population within a specified period of time. Once all specified weed populations are eliminated or prevented from reproducing, intensive efforts continue until the existing seed bank is exhausted." (CRS 35-5.5-103(11.7)(a)).
- 21. Geographic Information Systems (GIS):** a method used to map weed infestations using satellite technology (**Geographic Positioning System or GPS**) coupled with on-the-ground observations and computer mapping programs to determine the extent of an infestation and to track the long term effect of weed management practices.
- 22. Infestation:** An area of land containing one or more weed species. (North American Invasive Plant Mapping Standards, 2002).
- 23. Inspector:** Mesa County Weed and Pest Inspector.
- 24. Integrated Weed Management (IWM):** the planning and implementation of a coordinated program that uses a variety of effective tools to manage noxious weeds. Elements of an IWM plan include weed identification, education, prevention, cultural practices, mechanical removal, chemical use, and biological control.
- 25. Landowner:** any owner of record of state, federal, county, municipal, or private land, including owners of easements, irrigation canals and ditches, and rights-of-way.
- 26. List A Species:** "...rare noxious weed species that are subject to eradication wherever detected statewide in order to protect neighboring lands and the state as a whole." (CRS 35-5.5-108(2)(a)(I)).
- 27. List B Species:** "...noxious weed species with discrete statewide distributions that are subject to eradication, containment, or suppression in portions of the state designated by the commissioner in order to stop the continued spread of these species." (CRS 3-5.5-108(2)(a)(II)).

- 28. List C Species:** "...widespread and well-established noxious weed species for which control is recommended but not required by the state, although local governing bodies may require management." (CSR 3-5.5-108(2)(a)(III)).
- 29. MCTD:** Mesa County Transportation Department.
- 30. Mechanical Weed Control:** The physical removal of a weed by such methods as pulling, hand grubbing, rogueing, hoeing, burning, grazing, tillage, plowing, solarization and mowing.
- 31. Neighboring:** a property with a boundary immediately adjacent to the boundary of another property.
- 32. Noxious weed:** a non-native plant that has been designated by State rule as being noxious or has been declared a noxious weed by a County Advisory Board, and meets one or more of the following criteria:
- A. aggressive invaders detrimental to agriculture or native plant communities,
  - B. may be poisonous to livestock,
  - C. may be carriers of or hosts to insects, diseases or parasites,
  - D. are detrimental to sound management of native or agricultural ecosystems.
- 33. Noxious Weed Advisory Board (NWAB):** a panel of citizens appointed by the Board of County Commissioners to advise on management of noxious weeds in the County.
- 34. Noxious Weed List:** a list of noxious plant species that are to be managed within the County as recommended by the Noxious Weed Advisory Board and approved by the Board of County Commissioners.
- 35. Perennial weed:** a weed that lives for 3 or more years. These species usually spread by root systems or root pieces, as well as seeds.
- 36. Plan:** Mesa County Noxious Weed Management Plan
- 37. Propagules:** plant parts that have the ability to give rise to new plants, for example, seeds and root pieces
- 38. Rosette:** a circular growth of leaves that forms after germination of some plants.
- 39. ROW:** right-of-way
- 40. Rules:** Rules Pertaining to the Administration and Enforcement of the Colorado Noxious Weed Act (8 CCR 1206-2)

- 41. State Noxious Weed:** any noxious weed identified by rule by the Commissioner of the Colorado Department of Agriculture. The current list of noxious weeds can be found at <http://www.colorado.gov/ag/weeds>.
- 42. Statewide Weed Management Plan:** a plan for management of a weed species compiled by the State Noxious Weed Coordinator from recommendations made by county inspectors and others and approved by the Commissioner of Agriculture and the State Legislature; Statewide Weed Management Plans are a part of the Rules of the Noxious Weed Act.
- 43. Suppression:** “...reducing the vigor of noxious weed populations within an infested region, decreasing the propensity of noxious weed species to spread to surrounding lands, and mitigating the negative effects of noxious weed populations on infested lands.” Suppression efforts may employ a wide variety of integrated management techniques. (CRS 35-5.5-103(11.7)(c))
- 44. Weed and Pest Inspector or Inspector:** the agent or employee appointed by the Board of County Commissioners to fulfill the duties and functions designated under this Plan

## **1.0 Authority: Colorado Weed Management Act (“Act”): C.R.S. Title 35, Article 5.5, as amended**

### **1.1 Purpose of C.R.S. Title 35, Article 5.5**

Certain undesirable plants, primarily aggressive non-native invaders, constitute a threat to the “continued economic and environmental value of the lands of the state and if present in any area of the state must be managed” These species must be managed in an organized and coordinated manner on private and public lands, using integrated management techniques “which are least damaging and which are practical and economically reasonable.” (CRS 35-5.5-102)

### **1.2 An Abstract**

As mandated by the Colorado Noxious Weed Act (C.R.S. 35-5.5-104), all persons shall control noxious weeds on their property if such plants are a threat to neighboring landowners or natural ecosystems. Weed control programs should be integrated in their approach, using all available technologies to achieve effective weed control.

It is unlawful for persons to “intentionally introduce, cultivate, sell, offer for sale, or knowingly allow to grow” any species recognized as a noxious weed by the State (C.R.S. 35-5.5-104.5(1)(a), with a few exceptions (C.R.S. 35-5.5-104.5(1)(a)(I-V).

#### **1.2.1 County Noxious Weed Management Plan and Noxious Weed Advisory Board**

To comply with the Act, the Board of County Commissioners (BOCC) “shall adopt a noxious weed management plan for all of the unincorporated lands” (C.R.S. 35-5.5-105) (“County lands”) within its jurisdiction. The BOCC may adopt regulations, ordinances or resolutions to enforce this Plan and promote noxious weed management in the county. Agents, delegates, or employees may be used to enforce noxious weed control on county lands and to otherwise administer the provisions of the Act. The BOCC may enter into cooperative weed management agreements with other governmental agencies.

The Noxious Weed Advisory Board (NWAB), a committee of resident private landowners, shall develop and submit to the BOCC a County Noxious Weed Management Plan. The Plan shall be reviewed by the NWAB at least once every three years. At least a majority of the members of the NWAB must own forty or more acres of property within the County. The NWAB proposes which species are to be managed within the County (County Noxious Weed List) and recommends management plans for those species. The BOCC can approve, modify or reject management plans recommended by the NWAB. Management plans cannot be rejected for species with State designated eradication plans, unless the County submits a waiver of compliance to the Commissioner of Agriculture (Rules, Part 6). The NWAB can request that specific landowners submit weed management plans when listed noxious weeds are found on their property.

#### **1.2.2 Coordination of Effort and Designation of List A, B and C Noxious Weeds**

The State Department of Agriculture has determined that “an organized and coordinated effort must be made to stop the spread of noxious weeds” (C.R.S. 35-5.5-102). This effort is

facilitated by the State Noxious Weed Coordinator (“Coordinator”) who builds local coalitions and coordinates efforts of state, federal, local, and private landowners in developing Statewide Weed Management Plans. The County Weed and Pest Inspector shall submit to the Coordinator a management plan for a particular species, when requested, proposing what level of control (eradication, suppression, or containment) will be implemented in the County. The Coordinator compiles county recommendations and submits a Statewide Weed Management Plan for each species, as requested, to the State Noxious Weed Advisory Committee. The Committee reviews and recommends the Statewide Noxious Weed Management Plans to the Commissioner of Agriculture who, via the Legislature, incorporates the plans into the Rules (8 CCR 1206-2). A county may implement weed management plans for weeds that do not have a Statewide Plan.

The Rules designate and classify noxious weeds into three categories (C.R.S. 35-5.5-108). List A species are designated as weeds to be eradicated statewide. Eradication of all List A species is required whether or not they appear on a county’s Noxious Weed List. The intent of Statewide Noxious Weed Management Plans adopted by the state for List B weeds is to stop their continued spread. List B species management plans may require eradication countywide or in a localized area of a county or require containment or suppression countywide or in a localized area of a county. The Commissioner prescribes acceptable management techniques for each species on List A and B. All List B species Statewide Weed Management Plans contain a provision that “All populations in this state that are within 15 feet from the edge of any public road and any immediately adjacent area used for parking must be eliminated prior to seed development” in the year specified in the Statewide Plan. List C species are typically widespread within Colorado. The state noxious weed management plans for List C species, when adopted, will be designed “to support the efforts of local governing bodies to facilitate more effective integrated weed management.” “The goal of such plans will not be to stop the continued spread of these species but to provide additional education, research, and biological control resources to jurisdictions that choose to require management of List C species.” (Rules, Section 5.2)

Weeds that are not on a State List or that do not have an adopted Statewide Noxious Weed Management Plan may be designated as a noxious weed by a county.

Local governments or landowners may request a compliance waiver from the Commissioner that releases the local government or landowner from “certain obligations of eradication for a specific population of a List A or List B species.” (CRS 35-5.5-108.5 (2.7))

The Mesa County Noxious Weed List and management goals for List A and B species can be found in Tables 1 and 2 in Section 1.3 of this document.

### **1.2.3 Procedure for Enforcement of Eradication for List A and List B Species**

Local governing bodies shall “initiate and maintain contact with landowners who are affected by List A species and populations of List B species designated for eradication” (CRS 35-5.5-108.5(3)). The County shall “provide affected landowners with technical assistance” (CRS 35-5.5-108.5(3)(b)(I)) and “carry out sufficient measures, including project oversight and enforcement” (CRS 35-5.5-108.5(3)(b)(II)) to ensure that eradication of so designated species is accomplished. The County shall assist with distributing financial resources from the State to affected landowners and determine the portion of the cost of eradication to be paid by the landowner. The County shall submit mapping data as requested by the Commissioner. The

Commissioner may implement eradication programs directly if the County fails to perform its duties in regards to eradication.

A landowner affected by any List A species or a List B species designated for eradication shall allow the Inspector access to the affected property for the purpose of inspection and eradication when at least one of the following conditions occur:

“(a) The affected landowner or occupant has requested the inspection; or

(b) A neighboring landowner or occupant has reported a suspected noxious weed infestation and requested an inspection; or

(c) An authorized agent of the local government or commissioner has made a visual observation from a public right of way or area and has reason to believe that a noxious weed infestation exists.” (C.R.S. 35-5.5-108.5 (4))

If a noxious weed infestation is suspected, a letter must be sent via certified mail defining the problem and requesting an inspection. If entry is refused or there is no response from the landowner after 10 days from the mailing date of the certified letter, an inspection warrant must be obtained by the Inspector from a county or district court before an inspection is conducted (CSR 35-5.5-108.5(5)(b)(I)). A landowner cannot deny entry to inspect if a warrant is secured.

After inspection, a notice outlining the problem, stating steps to be taken for eradication and advising the landowner to commence eradication within a specified time frame shall be sent by certified mail. Within five (5) days of mailing the certified letter, the landowner shall comply with the recommendations or submit an acceptable noxious weed eradication plan. The County shall take action in the case of failure of the landowner to comply with the Act, by implementing the eradication plan, and assessing the entire cost of the eradication action to the landowner. The assessment becomes a lien on the property until paid. Funds collected shall be used in the furtherance of the County’s weed management efforts.

Once an eradication effort is made, the County has the right to enter the property to ensure compliance with the requirements of the eradication plan. The landowner may apply to the Commissioner of Agriculture for a waiver of compliance for species with an eradication designation (C.R.S. 108.5(14)).

The County cannot compel a private owner to control weeds without first applying the same control measures on any county-owned land or rights-of-way adjacent to the private property in question. If the County fails to take the actions outlined above for List A and List B species designated for eradication, the Commissioner is authorized to perform the eradication effort.

State agencies have the same responsibility as private landowners for List A and List B species designated for eradication (C.R.S. 35-5.5-110). Notification by the county is the same as for private landowners. The County has the power to enter infested public lands and undertake the eradication effort if the state agency does not comply with the eradication plan. The state agency having jurisdiction over the treated land shall pay for the expenses associated with the eradication effort. The County may enter into a written reimbursement agreement with the state agency.

#### **1.2.4 Procedure for Enforcement of Management for Species Not Designated for Eradication**

A landowner affected by List B or List C species not designated for eradication shall allow the local weed control official (Inspector) to inspect the affected property when at least one of the following conditions occur:

- “(a) The affected landowner or occupant has requested the inspection; or
- (b) A neighboring landowner or occupant has reported a suspected noxious weed infestation and requested an inspection; or
- (c) An authorized agent of the local government or commissioner has made a visual observation from a public right of way or area and has reason to believe that a noxious weed infestation exists.” (C.R.S. 35-5.5-109)

Before entering private property, the landowner or occupant must be notified of the pending inspection by certified mail. If entry is refused, an inspection warrant must be obtained by the Inspector before the property can be inspected (C.R.S. 35-5.5-109(2)(b)). A landowner cannot deny entry to inspect if a warrant is secured. When noxious weeds are identified on a property, the Inspector shall notify the landowner by certified mail which noxious weeds were found, how to control those weeds, and advise them to begin management within a specified time frame. Within 10 days of receipt of notification, the landowner or occupant must comply with the recommendations, submit an acceptable weed management plan, or request an arbitration panel hearing (C.R.S. 35-5.5-109(4)(a)). The county has the authority to control the weeds in the case of failure by the landowner to comply with the notification and assess the cost of control plus overhead expenses, up to 20% (C.R.S. 35-5.5-109(5)(a)(II)). The County has the right to enter the property to ensure compliance with the requirements of the management plan. The County cannot force a private owner to control weeds without first having equal or greater control measures on any county-owned lands adjacent to the private property in question.

### **1.2.5 Nuisance Declaration, Interagency Agreements and Funding**

Noxious weeds may be declared a public nuisance, subject to all applicable laws and remedies for abatement (C.R.S. 16-13, Part 3), including removal or destruction of the weeds (C.R.S. 35-5.5-113).

The county may enter into cooperative agreements for weed management with state and federal agencies (C.R.S. 35-5.5-111). Public lands under the jurisdiction of the County, including roads, highways, rights-of-way (ROWs), and easements, must be in compliance with the Act (C.R.S. 35-5.5-112).

A State Noxious Weed Management Fund was established to fund grants or contracts for weed management projects and education including procedures for allocation of funds to appropriate entities (C.R.S. 35-5.5-116). Counties may levy a tax of not more than 5 mils, upon voter approval, to fund noxious weed management programs (C.R.S. 35-5.5-119).

### **1.3 County Noxious Weed Lists**

Each county adopts a Noxious Weed List for weeds of importance to their county. In Mesa County, 19 weeds are officially listed (Table 1) as of 2009. The Noxious Weed List shall be published in a local newspaper in the spring of each year. Both common and scientific names shall be listed.

Any person or organization can submit proposals to the NWAB to add species to the County list. The NWAB also can propose additions. Proposals shall include a justification for addition to the List and a suggested countywide management plan that outlines areas of eradication, suppression and/or containment. Total eradication may be a goal if the weed is not widespread or not yet present in the county.

The NWAB will discuss additions at the next regular meeting following receipt of a proposal. Before the NWAB meets to discuss a new addition, a Public Notice will be published in a local newspaper so that interested parties can attend the meeting, voice their opinion or send in written comments. After discussing, reviewing and considering public comments, the NWAB will vote on submitting the proposal to the BOCC for consideration.

If a proposal to add a weed to the List is submitted to the BOCC, a 30 day public comment period and a public hearing will be held. Public comments will be solicited via a Public Notice printed in a local newspaper and other forms of public notification. The Public Notice will include the common and scientific names of the weed, a brief description of the management plan, an address where comments can be sent and the date and location of the public hearing. Weeds will be added to the list by approval of the BOCC at the public hearing after consideration of public comments.

Table 1 lists the weeds currently on the Mesa County Noxious Weed List. County Management Goals are determined by the Inspector in conjunction with the NWAB and state and federal land management agencies in the county. Species denoted with a \* are species for which eradication is the goal of the Statewide Weed Management Plan as of 2009.

Table 2 contains List A and List B species for which a State Weed Management Plan has been designated by Rule. The County must work to eradicate all of these species. They do not have to be listed on the County Noxious Weed List. Any additions or changes to the State Weed Management Plans automatically become part of the County Plan.

Table 3 lists species that occur in Mesa County and are known to be invasive in other parts of Colorado or in other states. These species are likely to be invasive in Mesa County. The Inspector in consultation with the State Noxious Weed Coordinator will decide whether eradication is warranted after identifying and mapping the infestations.

**TABLE 1: COUNTY LISTED NOXIOUS WEEDS**

| <b>Weed</b>  | <b>County Management Goal</b>   | <b>Geographical Areas</b>   | <b>State List</b> | <b>Seed Viability (years)</b> |
|--|---|---|-------------------|-------------------------------|
| Bull thistle ( <i>Cirsium vulgare</i> )                        | 1) CONTAINMENT/SUPPRESSION<br>2) ERADICATION                                      | 1) Above 7,000 feet<br>2) Below 7,000 feet                        | B                 | 5                             |
| Canada thistle ( <i>Cirsium arvense</i> )                      | CONTAINMENT/SUPPRESSION   | All of Mesa County  | B                 | Up to 30                      |
| Dalmatian toadflax – broad leaf ( <i>Linaria dalmatica</i> )   | 1) CONTAINMENT/SUPPRESSION*<br>2) ERADICATION*                                    | 1) Mormon Mesa, Big Creek<br>2) Elsewhere in Mesa County          | B                 | 10                            |
| Diffuse knapweed ( <i>Centaurea diffusa</i> )                  | ERADICATION*  | All of Mesa County  | B                 | Unknown                       |
| Dyer’s woad ( <i>Isatis tinctoria</i> )                        | ERADICATION *   | All of Mesa County  | A                 | 8                             |
| Goatshead/Puncturevine ( <i>Tribulus terrestris</i> )          | 1) CONTAINMENT/SUPPRESSION<br>2) ERADICATION                                      | 1) Below 7,000 feet<br>2) Above 7,000 feet                        | C                 | 5                             |
| Hoary cress/Whitetop ( <i>Cardaria draba</i> )                 | CONTAINMENT/SUPPRESSION*  | All of Mesa County  | B                 | 3                             |
| Houndstongue ( <i>Cynoglossum officinale</i> )                 | 1) CONTAINMENT/SUPPRESSION*<br>2) ERADICATION*                                    | 1) Above 7,000 feet<br>2) Below 7,000 feet                        | B                 | Unknown                       |
| Leafy spurge ( <i>Euphorbia esula</i> )                        | ERADICATION*  | All of Mesa County  | B                 | At least 8                    |
| Musk thistle ( <i>Carduus nutans</i> )                         | 1) CONTAINMENT/SUPPRESSION<br>2) ERADICATION                                      | 1) Above 7,000 feet<br>2) Below 7,000 feet                        | B                 | At least 15                   |
| Oxeye daisy ( <i>Chrysanthemum leucanthemum</i> )              | 1) CONTAINMENT/SUPPRESSION*<br>2) ERADICATION*                                    | 1) Above 7,000 feet in Eastern Mesa County<br>2) Below 7,000 feet | B                 | Up to 40                      |
| Plumeless thistle ( <i>Carduus acanthoides</i> )               | ERADICATION *   | All of Mesa County  | B                 | Unknown                       |
| Purple loosestrife ( <i>Lythrum salicaria</i> )                | ERADICATION *   | All of Mesa County  | A                 | At least 10                   |
| Russian knapweed ( <i>Acroptilon repens</i> ) (L)              | CONTAINMENT/SUPPRESSION*  | All of Mesa County  | B                 | 3-5                           |
| Scotch thistle ( <i>Onopordum acanthium</i> )                  | 1) CONTAINMENT/SUPPRESSION<br>2) ERADICATION                                      | 1) Above 6,000 feet<br>2) Below 6,000 feet                        | B                 | Unknown                       |
| Spotted knapweed ( <i>Centaurea maculosa</i> )                 | ERADICATION *   | All of Mesa County  | B                 | At least 15                   |
| Tamarisk ( <i>Tamarix parviflora</i> , <i>T. ramosissima</i> ) | USE BIOCONTROL TO SUPPRESS POPULATIONS (not mandatory for control in Mesa County) | All of Mesa County  | B                 | Less than 1                   |
| Yellow starthistle ( <i>Centaurea solstitialis</i> )           | ERADICATION *   | All of Mesa County  | A                 | At least 10                   |
| Yellow toadflax ( <i>Linaria vulgaris</i> )                    | ERADICATION*  | All of Mesa County  | B                 | 10                            |

**TABLE 2: STATE LISTED NOXIOUS WEEDS TO BE ERADICATED STATEWIDE**

| <b>Weed</b>   | <b>State List</b> | <b>Seed Viability (years)</b> | <b>Status in Mesa County</b>   |
|---|-------------------|-------------------------------|--|
| African rue ( <i>Peganum harmala</i> )                | A                 | Unknown                       | Not known to be present  |
| Absinth wormwood ( <i>Artemisia absinthium</i> )      | B                 | Unknown                       | Present in low numbers   |
| Black Henbane ( <i>Hysocyamus niger</i> )             | B                 | 4                             | Unknown  |
| Camelthorn ( <i>Alhagi pseudalhagi</i> )              | A                 | Several years                 | Not known to be present  |
| Chinese clematis ( <i>Clematis orientalis</i> )       | B                 | Unknown                       | Present in low numbers along Colorado River near Palisade                              |
| Common crupina ( <i>Crupina vulgaris</i> )            | A                 | 3                             | Not known to be present  |
| Cypress spurge ( <i>Euphorbia cyparissias</i> )       | A                 | 8                             | Relatively common in ornamental landscapes   |
| Giant salvinia ( <i>Salvinia molesta</i> )<br>AQUATIC | A                 | Negligible                    | Not known to be present  |
| Hydrilla ( <i>Hydrilla verticillata</i> ) AQUATIC     | A                 | Unknown                       | Not known to be present  |
| Meadow knapweed ( <i>Centaurea pratensis</i> )        | A                 | 7                             | Not known to be present  |
| Mediterranean sage ( <i>Salvia aethiopsis</i> )       | A                 | Unknown                       | Not known to be present  |
| Medusahead rye ( <i>Taeniatherum caput-medusae</i> )  | A                 | 2                             | Not known to be present  |
| Myrtle spurge ( <i>Euphorbia myrsinites</i> )         | A                 | 8                             | Relatively common in ornamental landscapes   |
| Orange hawkweed ( <i>Hieracium aurantiacum</i> )      | A                 | 8                             | Not known to be present  |
| Perennial pepperweed ( <i>Lepidium latifolium</i> )   | B                 | 10+                           | Along Colorado River from Fruita to Loma; scattered patches isolated patches elsewhere |
| Rush skeletonweed ( <i>Chondrilla juncea</i> )        | A                 | 3                             | Not known to be present  |
| Sericea lespedeza ( <i>Lespedeza cuneata</i> )        | A                 | 20                            | Not known to be present  |
| Spurred anoda ( <i>Anoda cristata</i> )               | B                 | Unknown                       | Not known to be present  |
| Squarrose knapweed ( <i>Centaurea virgata</i> )       | A                 | 3                             | Not known to be present  |
| Sulfur cinquefoil ( <i>Potentilla recta</i> )         | A                 | 3+                            | Present north and south of Collbran; unknown if present elsewhere in county            |
| Tansy ragwort ( <i>Senecio jacobaea</i> )             | A                 | 16                            | Not known to be present  |

**TABLE 3. INVASIVE SPECIES OF CONCERN NOT LISTED BY THE STATE OR MESA COUNTY**

| <b>Weed</b>  | <b>Habitat</b>                       | <b>Status in Mesa County</b>  |
|--|--------------------------------------|-------------------------------|
| Japanese, Giant and Bohemian knotweed ( <i>Polygonum cuspidatum</i> , <i>P. polystachyum</i> , <i>P. bohemicum</i> ) | Riparian areas, ornamental plantings | Found on the Redlands in 2008 |
| Syrian bean caper ( <i>Zygophyllum fabago</i> )  | Disturbed sites, roadsides           | I-70 near Fruita exit         |

## **2.0 Goals and Objectives for Noxious Weed Management In Mesa County**

*Prevention, early detection and early treatment are the most cost effective means for weed control, and are the ideal for preserving our agricultural production, recreational open space, natural environment, and aesthetics and attractiveness of urban and rural landscapes and the natural environment.*

- Prioritize weed management activities in the Division of Pest Management so as to maximize impact of control measures and maximize use of budgeted funds. (Section 3.1)
- Strive to contain, suppress or eradicate current weed infestations and reduce or eliminate weed seed production in certain species according to State Law and Rules and current County policy. (Sections 1, 3.1.1-2, 3.5.2-3, 3.6)
- Identify, monitor and promptly treat new infestations and new invasive species so as to prevent their spread on unincorporated lands in the County. (Sections 3.1.1-2, 3.6)
- Develop and implement Integrated Weed Management Plans for noxious weeds on County owned property, easements, and rights-of-way. (Sections 3.2.2, 3.3.1-2)
- Protect agricultural production, native plant ecosystems, watersheds, and recreational lands from degradation by noxious weeds by enforcing the Noxious Weed Act and working through cooperative agreements with municipal, state and federal agencies and adjacent counties and states. (Sections 3.2)
- Preserve the quality of life in urban areas of unincorporated Mesa County through desirable plant stewardship and noxious weed management to enhance human health aspects, land values and aesthetics. (Appendices A, B)
- Provide technical support and recommendations for noxious weed management and work to develop Integrated Weed Management Plans with all landowners and land users, including state and federal agencies. (Sections 3.4, 3.5.4, 3.6. Appendices A, B)
- Educate Mesa County citizens on the impact of noxious weeds on the economy and the environment and provide information on Best Management Practices for noxious weeds. (Section 3.4, Appendices A, B)

## **3.0 Operating Procedures for the Division of Pest Management and the Weed and Pest Inspector**

### **3.1 Prioritizing County Weed Management Efforts**

The Inspector must prioritize infestations in order to allocate time to the most critical weed problems. Infestations of some noxious weeds and infestations in certain areas are deemed

to be more significant than others and are ranked accordingly. The County must comply with State Weed Management Plans for eradication, containment or suppression of several species of noxious weeds (see Table 1 and 2).

**3.1.1 High Priority:** High priority species are those that either do not yet occur in Mesa County or do not yet occur in high numbers. Eradication or prevention of weeds listed as high priority is highly probable and extremely desirable. The management goals for High Priority noxious weed infestations are to prevent the introduction of weeds that are not yet present, to eradicate weeds that are not yet abundant in the County, and to stop the spread of noxious weeds to relatively uninfested parts of the County. Early detection and rapid response are critical management tools for High Priority species. All State List A species and populations of State List B species designated for eradication are High Priority species.

High Priority species elicit a high level of response from the Division. All possible methods are used to get landowners to comply with eradication requirements. The Inspector may choose to do the control work for the landowner, if the infestation complies with the private land spraying policy explained in Section 3.6 of this Plan. The situations listed below are typically small infestations of noxious weeds that are rare in the county, isolated patches of weeds that may be abundant elsewhere in the County, and weed patches that exist in areas where transportation of plant propagules is highly likely.

- Any infestation of dyer's woad, leafy spurge, plumeless thistle, purple loosestrife, yellow starthistle, yellow toadflax, and diffuse and spotted knapweed and all State List A species and populations of State List B species designated for eradication (see Table 1 and 2).
- Infestations of all weeds on the Mesa County Noxious Weed List on County, State and Federal roadsides, and high traffic areas.
- Isolated infestations of all County listed weeds and State List B species where such are not yet abundant and eradication is feasible.
- New infestations of non-native species that are not County or State Listed species, but are determined to be invasive by the Colorado Department of Agriculture or CSU Extension, or that are invasive in adjacent counties. A survey of the area surrounding the infestation will be done to determine the full extent of infestation before eradication or other high priority treatment is deemed the management plan for that species.

**3.1.2 Medium Priority:** Species listed as medium priority weeds are known to occur in the County, sometimes in large but relatively isolated infestations. These species are candidates for suppression and containment, but not necessarily eradication, except when they occur in very localized areas. The Inspector provides information to landowners, works with them on a noxious weed plan and offers a Cost Share Program Application. Some of the weeds mentioned here are widespread in certain parts of the county and it is the situation in which they occur that is important. Uncooperative landowners will be reminded several times of their responsibility to control their weeds. If time allows or timing and circumstances dictate, further enforcement will be done.

- Infestations of Canada , Scotch, musk and bull thistle and oxeye daisy below approximately 7,000 feet in elevation.

- Dalmatian toadflax on Mormon Mesa near Molina and Parker Basin and Big Creek Drainage near Collbran.
- Russian knapweed, hoary cress (whitetop) and houndstongue in areas where livestock or horses that are susceptible to poisoning are grazing and where the weeds appear to be the primary food source for the animals.
- Goatshead/Puncturevine above 7500 feet elevation.

**3.1.3 Low Priority:** Low priority weeds occur in large, widespread infestations or are widespread in localized parts of the County. At best these weeds can be prevented from spreading to uninfested areas and are best managed on a parcel-by-parcel basis. Enforcement in the following situations is unlikely to result in adequate control because infestations are very extensive and reinfestation is likely. Upon receiving a complaint, landowners are notified of the problem and given recommendations for control. The Inspector works with landowners on a parcel by parcel basis. If time allows and efforts will be cost effective, further enforcement may be done.

- Infestations of Scotch, Canada and musk thistle, oxeye daisy, and houndstongue above approximately 7,000 feet elevation in eastern Mesa County.
- Hoary cress (whitetop), puncturevine, tamarisk and Russian knapweed throughout Mesa County, primarily in the Lower Valley and along the Colorado and Gunnison Rivers.

## **3.2 Coordination of weed management activities**

The Inspector and the Division will coordinate whenever possible with other agencies, counties and organizations to attain successful, countywide weed management activities in the County.

### **3.2.1 Non-county entities**

The Act authorizes the County to enter into cooperative agreements with federal and state agencies for better integration of weed control on public land within the County. Mesa County has Memoranda of Understanding with the Bureau of Land Management, the U.S. Fish and Wildlife Service and the U.S. Forest Service. Such agreements allow the sharing of resources and personnel to attain common weed management goals on public and private land. Other agencies with which the County may cooperate with on interagency projects include, but are not limited to, U.S. Bureau of Reclamation, Colorado National Monument, Natural Resources Conservation Service, Conservation Districts, Colorado Department of Transportation, City of Grand Junction, Town of Collbran, Town of Debeque, Town of Fruita, Town of Palisade, Colorado Division of Wildlife, CSU Cooperative Extension, Western Colorado Research Centers, Biological Pest Control Section of the Colorado Department of Agriculture (Palisade Insectary), Irrigation and Drainage Districts, Cooperative Weed Management Areas, adjacent counties and Colorado State Parks. In a situation where noxious weeds exist on private property adjacent to infested public lands, the Division will work to remedy the situation with the agency that owns the adjacent public property before pursuing enforcement on private land.

### **3.2.2 County Departments and Divisions**

The Division cooperates with all County Departments on weed control issues, offering weed identification services and recommendations for control. Weed control in Mesa County Parks and Facilities are the responsibility of the Facilities and Maintenance Department.

Responsibility of the counties for control of undesirable plants in public roads and rights-of-way (ROW) are stated in the Act. Because ROW are the principle routes of introduction of weed seed or propagative parts via movement of vehicles, hay, animals, etc., the Inspector works closely with the Mesa County Transportation Department (MCTD) and Colorado Department of Transportation (CDOT) to effectively control weeds on County, State and Federal ROW. Species identification and control recommendations are provided by the Inspector. The County may contract with a private applicator for ROW noxious weed control on County, State and Federal roads. Weed control on MCTD-owned properties (e.g. maintenance shops) is performed by MCTD personnel under the indirect supervision of the Inspector.

The Division of Pest Management reviews community plans developed by the Planning Department. The Inspector identifies weed issues, recommends solutions and provides wording for planning policies and documents.

### **3.3 Mapping**

At the County level, mapping can provide valuable information on the mode of spread of weeds and the extent of each species present in the County, and provides a method to estimate the costs of controlling noxious weeds on County and other property. Mapping aids the State Department of Agriculture in the development of noxious weed management plans for eradication, containment and suppression activities in Mesa County. Noxious weeds are mapped wherever possible using GPS equipment and GIS technology. Information is shared with County, State and Federal agencies. Data collected conforms to the standards established by the North American Weed Management Association. The Inspector provides this data to the Colorado Department of Agriculture for the state weed mapping program as requested.

#### **3.3.1 Roads**

Rights-of-way on all County maintained roads are inspected and weed infestations are mapped using GIS on a three year schedule as time and personnel allows. In areas where activities have disturbed the ROW, mapping may occur more frequently.

#### **3.3.2 Other County Properties**

Undeveloped County owned properties are inspected and noxious weeds are mapped using GIS by the Division as time allows. The Inspector then works with the appropriate County Department to develop an Integrated Weed Management Plan.

#### **3.3.3 Private property**

GIS mapping is not used to map weeds on private property, except List A species or a List B species designated for eradication, unless deemed necessary by the Inspector. Noxious weeds that are reported or noticed by a property owner, the Inspector, a government employee,

or a concerned citizen are located on a paper map of the property. The map may be used for education of the landowner and in enforcement actions.

### **3.4 Education**

For a weed management program to be successful, the general public needs to be well informed. The Citizens should be encouraged to take ownership of their weed problems and make the necessary effort to control weeds on their property.

Educational activities of the Division include publishing articles and ads in local newspapers; holding interviews with local TV and radio stations; placing posters and displays in public places; assisting with weed projects in schools; holding public lectures and workshops; making presentations and showing videos to the public, and to private and community organizations; building local Cooperative Weed Management Areas (CWMAs); and providing training opportunities for government agencies, community organizations, and private enterprises.

Educational efforts should:

- Assist the public with weed identification and control methods.
- Provide information on the Best Management Practices for control of species on the Mesa County Noxious Weed List and State Lists A, B and C.
- Explain the environmental impact of weeds on our quality of life, on agricultural production, and on native plants and wildlife.
- Stress the economic impact of weeds on agricultural production and the cost of food, native plants and community ecology, wildlife habitat, real estate values, wildfire management, and recreational opportunities, among others.

### **3.5 Management of Noxious Weeds on Private Property**

The following procedures will be implemented when the Inspector receives a report of a noxious weed infestation on private property. An initial screening of the property from public rights-of-way or a neighboring property will be made to determine if the complaint is valid. After determining the validity of the report, every effort will be made by the Inspector to contact and/or meet with the landowner, get permission to enter the property to identify the weeds, develop a Weed Management Plan with the landowner, and follow up on control efforts before enforcement is imposed. The Inspector will inform the landowner of County or other Cost Share Programs available to assist with the cost of controlling the weeds. If the landowners is not compliant or not cooperative, the enforcement action will proceed.

#### **3.5.1 Landowner Cooperation**

Cooperation between the landowner and the Inspector is essential to the management of noxious weeds. Cooperation by the landowner is defined as allowing the Inspector or assignee entry to the property in question for inspection and post-treatment follow-up, assisting with development of a Weed Management Plan, and complying with the Management Plan. The

Inspector shall strive to work with the landowner to develop a Weed Management Plan that considers the landowner's resources, reflects Best Management Practices, and incorporates scientifically proven methods of weed management. Suppression, containment, or eradication of the weeds, depending on State or County weed management plans and the specific situation, will be defined as the outcome of the Management Plan. If the landowner and the Inspector cannot agree on a Management Plan, the landowner can request an arbitration panel to determine the final Management Plan. The composition and selection of the arbitration panel is defined by State Law (C.R.S. 35-5.5-109 (4)(a)(III)). Failure to manage the weeds according to the Management Plan will be deemed as non-cooperation.

A warrant must be obtained to enter and inspect the property when a landowner refuses to allow entry (see Section 3.5.3.3.1 (iv)). The cost of treating the weeds may be billed to the landowner. Unpaid bills may be placed as a lien on the property. Cost Share funds through Mesa County are not available to uncooperative landowners.

When cooperation is not forthcoming from the landowner and a noxious weed infestation is present and not being managed in accordance with State weed management plans or acceptable Best Management Practices for noxious weeds in Mesa County, the Inspector will bring the case to the NWAB. The NWAB will decide whether or not the case should be pursued. Upon recommendation of the NWAB, the case will be brought to the Board of County Commissioners. The Commissioners will decide whether the Inspector should proceed with enforcement of the State Law and County Procedures, and will allocate funds to pay for treatment pending reimbursement by the landowner directly or through a lien on the property.

### **3.5.2 Priorities for Implementing Enforcement Action**

The following situations are recognized as priorities for executing noxious weed management on private property:

1. infestations of high and medium priority noxious weeds as defined in Section 3.1.1 and 3.1.2 on any type of private property;
2. infestations noted by the Inspector or other County employees that are encroaching on county road rights-of-way, making it difficult to control or eradicate such noxious weeds on county roads.
3. properties infested with noxious weeds that threaten productive agriculture where the landowner requests assistance or where a complaint has been filed with the Inspector;
4. a complaint from an adjacent neighbor or a request for assistance from the landowner that noxious weeds are infesting or have the potential to infest their non-agricultural property;

### **3.5.3 Standard Operating Procedures for Enforcement**

#### **3.5.3.1 Responsibility**

It is the responsibility of the Mesa County Weed and Pest Inspector and her/his assignee to follow all procedures established in CRS 35-5.5 before any management or control of noxious weeds is carried out on privately owned land. The Inspector and her/his assignee will keep complete records of all interactions (conversations, phone calls, letters, actions taken, etc.) with landowners. Bills for the cost of control measures will be prepared by the Inspector and submitted to the County Finance Department for processing.

Revised November 2009

### 3.5.3.2 Requests For Assistance

When a request for assistance is received from a landowner, a field visit will be arranged to identify the weeds present. If no noxious weeds are found, recommendations for management of non-noxious weeds will be given, if necessary. If noxious weeds are found, the infestations will be mapped on a paper map or using GIS/GPS and a copy of the map will be given to the landowner. A Weed Management Plan will be developed in conjunction with the landowner and an application for the Cost Share Program will be offered to the landowner.

### 3.5.3.3 Complaints

When a complaint of a noxious weed infestation is received the following procedures must be followed before noxious weed management or control can be carried out by the County on privately owned land:

#### 3.5.3.3.1 Inspection

The Inspector shall verify the infestation before taking further action. The landowner shall then be notified of impending inspection of their property in the following ways:

i) If the presence of noxious weeds must be confirmed by an on-site inspection (i.e. cannot be confirmed from the right-of-way or neighboring property), the Inspector or her/his assignee will contact the landowner by **phone**, if possible, to get permission to enter the property. All phone calls will be documented as to date and information given. If the landowner cannot be contacted by phone, a **certified return receipt mail letter** shall be sent to the landowner, stating a specific date and time for the inspection. If the landowner wishes to be present during the inspection, the date and time of the inspection shall be adjusted to accommodate them.

ii) If noxious weeds can be confirmed from the right-of-way or neighboring property, the landowner can be contacted either by **phone or certified return receipt mail letter** to request an on-site inspection. A specific date and time for the inspection shall be given to the landowner. The landowner can request another appointment time to fit their schedule. The letter shall ask the landowner to contact the Division of Pest Management to acknowledge receipt of the letter at least one (1) business day before the pending inspection.

iii) The following information will be included in the Inspection letter:

- time and date of inspection;
- suspected noxious weed(s) present;
- landowner's responsibility to manage noxious weeds in Mesa County;
- availability of Cost Share Program funding; and
- consequences of non-cooperation. The landowner shall be given a full explanation of the importance of cooperating with the County to manage weeds on private property.

iv) If no response is forthcoming from the landowner or if access to the property is denied by the landowner, an **inspection warrant** will be sought and all associated court costs will be assessed against the landowner, unless good cause can be demonstrated by the landowner as to why the response was not given in a timely manner,

v) All possible methods shall be engaged to determine that the actual owner of the property has been contacted. If the property has been transferred, the new owner must be informed of the weed problem before any further action can be taken.

### 3.5.3.3.2 Notification

Once the Inspector or her/his assignee has inspected the property and confirmed a noxious weed infestation on the property, the landowner shall be contacted **in person, by phone or by certified return receipt mail letter** to notify them of the presence of noxious weeds. If contacted by **phone or in person**, a follow-up letter will be sent **via certified return receipt mail** within three (3) business days of the conversation. The landowner shall be given the following information:

- Location of noxious weed infestations;
- Common and scientific names of noxious weeds found;
- Acceptable, effective control measures for the weeds;
- The stage or time of year control measures must be performed for greatest control;
- Any other information on Best Management Practices for the weeds of concern;
- Information on available Cost Share Programs;
- The date by which the landowner must contact the Inspector to begin developing a Weed Management Plan for the property;
- Notification that within ten (10) days (five (5) days for State List A species and populations of State List B species designated for eradication) from receipt of the notification letter the landowner shall indicate whether she/he will:
  - i) comply with the terms of the notification;
  - ii) acknowledge the terms of the notification and submit an acceptable alternative weed management plan and schedule for completion of the plan for compliance; or
  - iii) request an arbitration panel as described in C.R.S. 35-5.5-109 (4)(a)(III) to determine the final weed management plan (except for State List A species and populations of State List B species designated for eradication where an arbitration panel is not an option); and
- Notification that failure to contact the Inspector by the specified date indicates non-compliance by the landowner and noxious weed management procedures will be initiated by the County.

### 3.5.3.3.3 Enforcement Notice

An Enforcement Notice will be sent in the following situations:

- When the landowner refuses to contact the Inspector, refuses to grant entry to the property, refuses to develop a Weed Management Plan, or otherwise refuses to

- control the noxious weeds;
- Weed control efforts have not been implemented within the time period specified in the Weed Management Plan developed by the Inspector and the landowner; or
- When immediate action is necessary and the landowner has not been cooperative, i.e., when the weed is in the prime stage to be controlled and any delay will either cause it to go to seed or postpone control until the following season.

The Enforcement Notice will be sent by **certified return receipt mail** and shall include:

- Location of noxious weed infestations;
- Common and scientific names of noxious weeds found;
- Acceptable, effective control measures for the weeds;
- The stage, time of year or specific date when control measures must be performed for greatest control;
- Any other information on Best Management Practices for the weeds concerned;
- Notification that the landowner has ten (10) days (five (5) days for State List A species and populations of State List B species designated for eradication) from receipt of the enforcement notice to either comply with control procedures or submit in writing that she/he will cooperate with the Inspector to develop a Weed Management Plan; and
- Documentation of previous attempts to contact the landowner.

#### **3.5.3.3.4 Enforcement**

If a landowner receives an Enforcement Notice and does not contact the Inspector within ten (10) days (five [5] days for State List A species and populations of State List B species designated for eradication) of receiving the notice:

- i) The Inspector will review all information pertinent to the case.
- ii) The Inspector will bring the case to the attention of the NWAB. The NWAB will recommend the case to the Board of County Commissioners for further action if warranted.
- iii) The Inspector shall request a right-of-entry to control the weeds from the County Commissioners at a public hearing.
- iv) If right-of-entry is given, the Inspector or her/his assignee will contact the designated private contractor to schedule the control work.
- v) After control work is carried out on private property, the Inspector or her/his assignee shall check the contractor's work for completeness. The timing of the inspector's visit shall depend on the weed species and control method or methods used.

#### **3.5.3.3.5 Billing**

After noxious weed control measures are carried out:

- a) A bill will be prepared for the cost of control plus a 20% administrative fee as permitted under CRS 35-5.5-109.
- b) The bill will be sent by **certified return receipt mail**.
- c) If the bill is not paid after 30 days, an assessment may be placed against each lot or

tract of land, until paid, and shall have priority over all other liens except general taxes and prior special assessments. Such assessment may be certified to the county treasurer and collected and paid in the same manner as provided for the collection of taxes.

d) The Inspector or her/his assignee will contact the Treasurer's Office for special assessment on the property which may result in a lien on the property.

e) Any funds collected for the management of noxious weeds on private property shall be deposited in Mesa County's Division of Pest Management Noxious Weed Fund.

### **3.5.4 Mesa County Noxious Weed Cost Share Program**

The County shall provide a Noxious Weed Cost Share Program to assist landowners within unincorporated Mesa County with the cost of managing noxious weeds. The program will be administered by the Mesa County Weed and Pest Inspector. Allocation of funds will be for those species listed on the Mesa County Noxious Weed List or State List A species and populations of State List B species designated for eradication and shall be prioritized. Applications will be reviewed and approved by the NWAB. Funds will not be available to landowners who have had a complaint lodged against them and who fail to cooperate with the Inspector.

**3.5.4.1 Application Process:** An application may be acquired from the Inspector or the County web site and must be complete to be considered for funding. The application must be accompanied by a Weed Management Plan that has been approved by the Inspector as well as a map of the property that delineates the weed infestations. The Inspector or assignee will be available to assist landowners with weed identification and development of a Weed Management Plan.

Applications will be considered three times per year and prioritized according to the Mesa County Noxious Weed List or State List A species and populations of State List B species designated for eradication and other criteria listed in the program documents. If all funds have been allocated for the year, the application may be considered for funding the following year. In the case of weed species that are a high priority for control, additional budget funds may be requested from the County.

**3.5.4.2 Eligibility:** Landowners with noxious weeds who own or operate property on the Mesa County Tax rolls are eligible to apply for the Cost Share Program. Lessees and other property managers must submit written approval from the landowner to participate in the Cost Share Program.

**3.5.4.3 Reimbursement:** The Cost Share Program will pay for a percentage of the cost of herbicides, if applied by the landowner or a percentage of the cost of professional herbicide application, and/or mechanical control for certain weeds, up to a total of \$500 per landowner per year. Reimbursement percentages will be determined by the NWAB. Costs other than those listed may be considered by the NWAB if appropriate documentation is provided. The noxious weeds may be treated with herbicide by the landowner or their assignee, or by a licensed commercial applicator. Although landowners may personally apply herbicides to the weeds or utilize any agent for application purposes, reimbursement for labor costs shall only apply to a

licensed certified pesticide applicator. Any use of a landowner's employee for herbicide application purposes shall not be reimbursable. All herbicides must be applied according to the product label. Cost Share funds may be withheld if it is found that treatment was not done in accordance with the Weed Management Plan or the product label.

**3.5.4.4 Reasons For Disqualification or Denial:** A landowner's Cost Share application may be denied in the following circumstances:

- If the landowner has not cooperated with the Mesa County Policy for Management of Noxious Weeds on Private Property to the extent that a warrant for inspection was required.
- Attempting to defraud the program in any manner.
- Applying herbicides inconsistent with the product label.
- Using program materials outside of the program guidelines.
- Failure to follow weed control recommendations as described in the Weed Management Plan.
- Using cost-share money to control weeds other than those eligible except where such weeds exist in conjunction with the eligible weeds.
- The budget of the Cost Share Program is exhausted.

### **3.6 Herbicide Application on Private Land by the County**

It is extremely important that small infestations of certain weeds (e.g. all List A and List B species to be eradicated) in certain areas be eradicated as soon as possible. Herbicides are most effective when sprayed at specific stages during the life cycle of the weed. To insure that small infestations of noxious weeds are controlled or eradicated efficiently and effectively, it is extremely important that the Inspector be able to take immediate action on certain weed patches. Immediate attention ensures that the weeds do not become a widespread and costly problem.

When such a weed infestation is located, the Inspector contacts landowners and arranges for the application of herbicides. The Inspector or assignees will only spray certain species on private land where they occur in low numbers or in small areas. If spraying is done by County personnel, only hand gun, hand held or backpack sprayers will be used. It is not intended that Mesa County use motorized equipment or spray large infestations. If the weed infestation is extensive and should be treated by motorized equipment, the Inspector will arrange for treatment by a licensed certified applicator. Payment for treatment will be arranged between the Inspector and the landowner.

Each situation is considered separately and the Inspector makes the final decision whether or not to spray a particular weed patch for the private landowner. A "consent to spray" agreement must be signed between the County and the landowner before the work is done. The consent agreement can be FAXed or scanned and emailed between parties to expedite the process.

The noxious weeds listed in Mesa County covered under this section are high priority species listed in section 3.1.1. . Medium and low priority species listed in Section 3.1.2 and 3.1.3 will be considered only where they occur in isolated patches or at the extreme edges of their range within the County.

### **3.7 Funding of Weed Management Projects**

Pursuant to C.R.S. 35:5.5:119 the County may establish a noxious weed management fund. Subject to approval of the voters, the County may levy a special tax for noxious weed control, up to 5 mils per year. No mil levied weed management fund exists nor is anticipated in Mesa County. Funding for noxious weed management is currently restricted to specific projects in cooperation with the agency partners described in section 3.4 and within the Cost Share Program in section 3.6.4. Private landowners must either be involved in one of the projects, apply for Cost Share Funds, or must pay for weed management from their own funds.

**APPENDICES**

# Appendix A

## A Guide to Integrated Weed Management Planning

The following discussion is intended to help landowners and land users devise a Weed Management Plan. Making a Plan allows the landowner or land user to assess the situation and determine what will be needed to manage weeds. .

### A1 Identification

The first and most important step in developing a plan of attack on noxious weeds is species identification. Misidentification of weed species leads to improper, costly, and ineffective control and management.

Newcomers and long-time residents may be familiar with a weed but each may call it by a different common name. For example, a weed commonly known as kochia (*Kochia scoparia*) by weed managers is called ironweed, fireweed, pigweed and Mexican fireweed by non-specialists. Weeds can be identified by CSU Cooperative Extension, 2775 Hwy. 50, or by the Mesa County Division of Pest Management. Once the weed is identified, recommendations for control and management can be obtained from CSU Extension Weed Specialists, the Natural Resources Conservation Service (NRCS), the Mesa County Weed and Pest Inspector or private contractors.

Proper identification of new noxious weed species is extremely valuable for eradication efforts. Any unusual or unfamiliar plant should be reported to the Mesa County Weed and Pest Inspector. A cluster or small infestation of unusual plants or plants that appear to be spreading rapidly should also be reported to the Inspector. If yellow starthistle had been reported when it first appeared in eastern Mesa County in about 1991, it could have been eradicated immediately and the area closely monitored. Left unreported, starthistle is now known to infest about 200 acres in Mesa County. Eradication is still possible, but will be a lengthy and costly endeavor.

### A2 Mapping

Marking out weed infestations on a map, whether it be by computer (GIS) or hand drawn methods, provides a landowner or weed manager with information about the extent of the infestation, possible modes for spread, potential uninfested areas to be protected and monitored, and the effectiveness of control methods. Over the long term maps provide historical evidence of the epicenter of an infestation and track its spread or decline.

### A3 Evaluation of Control Strategy

Once the weed has been identified and the infestation has been mapped, the landowner or weed manager must make a decision whether eradication, suppression (long term control), or containment should be the goal, what can be done to prevent reinfestation, and how to prevent its spread. The cost and resources available to plant and maintain competitive desirable species must be evaluated.

Small weed patches can be eradicated quickly using minimal amounts of herbicide or hand digging if there is no source of continued reinfestation. Suppression of larger patches should utilize all possible aspects of integrated management with the goal of keeping the weed from spreading and slowly reducing the size and/or density of the infestation . It is necessary to tolerate the presence of some weeds every year during a long term program, but seed production should be reduced or eliminated whenever possible.

Containment may be the best choice for very large patches (several acres) of perennial weeds that are too costly or impractical to eradicate. Depending on the species present, the infestation can be contained by spraying herbicides on or tilling around the perimeter of the patch, mowing to prevent seed production, and focusing on eliminating the weeds in areas where they are most likely to spread such as roads, waterways, or on animals. An integrated plan that combines the release of biological control agents in the central part of the infestation with chemical or mechanical control around the perimeter may be practical for large infestations. Consult with a weed management specialist when making these decisions.

#### **A4 Preparing an Integrated Weed Management Plan**

Once the weeds are identified, the infestation is mapped, and a general strategy is chosen, information on specific control measures must be sought so that a plan can be formulated. Weed managers must answer a lot of questions, such as but not limited to:

1. the amount of time and money that is available for control work;
2. when control measures should be applied based on the life cycle of the plant
3. whether mechanical means can be used and if there is enough labor available;
4. what type of herbicides are effective, available and appropriate for the land use and soil types on the property;
5. if biological controls are available and effective;
6. if and when seeding should be done, with native or non-native species, and what equipment or contractor is available to do the work; and
7. whether control on sites of potential reinfestation is included in the plan or if other landowners must be recruited to assist in the program.

For infestations covering many properties and large areas, a Cooperative Weed Management Area can be formed to coordinate control efforts among many landowners and land users. Contact the Mesa County Weed and Pest Inspector for more information.

Information on weed and land management can be found locally from CSU Cooperative Extension, the Natural Resource Conservation Service, the Inspector, and other local weed specialists. The Internet can be used to find general information on management techniques for a particular species, but local specialists should be contacted for appropriate herbicide rates and recommendations and seeding information.

#### **A5 Weed Control Principles**

An integrated approach to weed management is extremely important because no single tool, such as herbicides, will do the entire job. Integrated Weed Management results in highly effective, affordable weed control. The five principles of IWM are:

- **Prevention:** Prevention should always be practiced and is effective on all species of weeds. Prevention includes good land stewardship, planting weed free seed, avoiding planting invasive species, using weed seed free mulch and erosion control, using clean equipment, and legal measures such as quarantines and weed laws.
- **Cultural practices:** Good stewardship of the land is essential in preventing as well as controlling weed infestations and is effective for all species of weeds. Cultural practices encourage competition from desirable plants through dense seeding, fertilization, mulching, careful irrigation practices, sensible grazing regimes, and improved land management practices.

- **Physical/mechanical methods:** This includes hoeing, hand grubbing or rogueing, tillage, mowing, discing and plowing, solarization, burning, etc. The target of these methods is primarily to prevent seed production. Weeds should be treated before flowers are in full bloom. In general, mechanical methods are very effective for control of annual and biennial weeds and less effective for perennials. Thoroughly cleaning equipment before moving to uninfested areas is essential to prevent the spread of weeds.
- **Biological control:** Biocontrol is the introduction of living organisms that are detrimental to the noxious weed. This may be an insect, nematode, or bacterial, fungal or viral disease or the use of forage animals such as sheep, goats or cattle in controlled grazing. Biological control rarely provides 100% control and must be incorporated with other methods for successful management. Contact the Biological Control Section of the Colorado Department of Agriculture, Division of Plant Industry at 970-464-7916 for information on the availability of biocontrol agents.
- **Chemical control:** The judicious use of the proper herbicides at the optimum time can be the most effective method of control for very persistent weeds. Not all herbicides are equally effective on all weeds nor can every herbicide be used in every situation. Noxious weeds, in particular, are often not controlled successfully with “garden type” products. **Read the label several times**, and consult weed manuals and experts for the most effective chemical to use. Wear all personal protective equipment (PPE) indicated on the label. Be sure to apply the herbicides at the proper stage of weed growth. Drought may cause plants to be less susceptible to herbicides; wait to apply herbicides until there is adequate soil moisture and the plants are actively growing again.

***KNOW YOUR WEEDS!***

*Use the right method at the right  
time of the life cycle.*

*Read the herbicide label!  
Do not use more than the label rate.*

*Use all precautions for safety.*

# APPENDIX B

## Best Management Practices for Noxious Weeds in Mesa County

Effective control of weeds requires persistence and vigilance as well as an understanding of weed management principles and the weed's life cycle. Choosing a method of weed control depends on many factors, including the weed species, proximity to water, presence of desirable vegetation, soil type, depth of the water table, growth stage of the weed, temperature, rainfall or lack thereof, and available labor, time, and money. The following recommendations are general in scope. Landowners should consult with weed management specialists, CSU Cooperative Extension personnel, or the Mesa County Weed and Pest Inspector when making plans to treat noxious weeds.

### B1 General Guidelines

- 1) **KNOW YOUR WEEDS!** Identification is the first step in forming a weed management plan.
- 2) Early detection is always the best defense against noxious weeds. Treat intensely when a new or small patch is found.
- 3) Understand the biology of the weed to better select the best management practices. Know the plant's life cycle, what type of root system it has, what time of year it flowers and how long the seeds last in the soil.
- 4) Weed management is a long term process and hence a long term commitment to the land. Weed seeds last 5-50 years in the soil and pieces of root as small as 1/2" can start a new plant and a new infestation.
- 5) Know at which growth stage to implement control measures so that control is most effective. For example, once a biennial or annual has gone to seed, it is too late to do anything about it. Spraying a perennial weed in the rosette stage is a waste of chemicals because the root system will respond by sending up new shoots.
- 6) Use weed free seed, hay, forage, and mulch to prevent introduction of new weeds.
- 7) Reseed the site with competitive species. Grasses are often recommended so that broadleaf herbicides can be used to spot treat broadleaf weeds. Plant a diversity of species rather than a single species if possible.
- 8) Mowing and burning are effective weed management tools in some situations and with certain weeds. Mowing may cause the plant to flower at the mowed height, so seed set may be reduced but not eliminated. Burning may stimulate germination of some weed seeds. Most weed seeds are not destroyed by burning because temperatures are not high enough to completely burn the seed.
- 9) When tilling, till the weed patch last and then clean the equipment as best as possible in the field to prevent spreading roots and seeds. Always clean equipment and machinery after working in a weed patch. To avoid picking up and spreading mud that contains weed seeds do not drive through a weed patch when the soil is wet.

- 10) Many biological control agents are available for control of large weed patches. This is a complicated process and not recommended for small patches. Long term monitoring is essential to determine the extent of control and establishment of the agent. Biological control never provides 100% control and must be incorporated with other methods for successful management.
- 11) Grazing can be used as a weed management tool, but is not as simple as letting the animals out into the weed patch. Obtain information on which animals to use, level of intensity and duration, and what results you can expect. Temporary fencing may be necessary until the stand is established, particularly in areas where wildlife and other grazers are active.
- 12) Drought causes plants to shut down their growth process. Spraying weeds during dry periods is not recommended because effectiveness diminishes greatly. Treat after rainfall IF the weed is still in the proper stage for effective control.
- 13) Not all herbicides work equally on all weeds nor can every herbicide be used in every situation. Noxious weeds, in particular, are often not controlled successfully with products available at nurseries, garden shops and other retail gardening markets. **Read the label** and consult weed manuals and experts for the most effective chemical to use.
- 14) When developing a weed management plan, consider how much time, money, and land is involved. If you want to do non-chemical control, you may not need a lot of money, but you will need a lot of time and energy. If you want fast action, herbicides can be the most efficient use of money and time. Annual weeds may be as effectively controlled with tillage or hoeing as spraying if done properly and at the right time.

## **B2 Control of Annuals & Biennials**

**Target: Prevent seed production; many seeds lay dormant in the soil for 3-10 years.**

- 1) Hand grubbing (pulling), hoeing, tillage, solarization, cultivation in rosette stage and before flowering or seed maturity.
- 2) Chop roots at least 2" below soil level.
- 3) Post emergent herbicide treatment in the rosette or bolting stage, before flowering.
- 4) Pre-emergent herbicide treatment is effective on most annual weeds. Apply in the early spring before spring annual weeds emerge and in the late summer for winter annuals. Pre-emergent treatments can be effective for up to 3 months. Watering into the soil may be necessary to get the herbicide into the germination zone. **Follow label instructions carefully.**
- 5) Mow biennials after bolting stage and before seed set; be aware that mowing annuals may not prevent the plants from flowering and setting seed.

## **B3 Control of Perennials**

**Target: Deplete nutrient reserves in root system, prevent seed production. Seeds of many species lay dormant in the soil for 10 or more years. Root systems may reach 40 feet depth.**

- 1) It is very important to know what perennial weed you have before deciding on a control tactic. Perennials vary widely in their response to mechanical control.
- 2) Allow plants to expend as much energy from root system as possible; do not treat when first emerging in spring but allow them to grow to bud to bloom stage.
- 3) Herbicide treatment at bud to bloom stage or in the fall. Spraying in the fall will kill the following year's shoots, which are formed in the fall. If the weed patch has been there a long time, another season of seed production is not as important as getting the herbicide into the root system.
- 4) Mowing is not recommended for all perennials because some of them will flower at the mowed height; seed production may be reduced, however. Herbicides alone may be more effective than mowing followed by herbicide treatment. However, a combination of repeated mowing to prevent flowering followed by herbicide treatment in the fall is effective for some perennial weeds such as Canada thistle. The effect of mowing is species dependent so know what weed you are working with and consult the experts.
- 5) Tillage may or may not be effective. Most perennial roots can sprout from pieces only ½" - 1" long. Repeated tillage over the course of a summer may destroy soil structure and be more detrimental than an herbicide treatment. Clean machinery thoroughly before leaving the weed patch.

## **B4 Integrated Pest Management Practices**

No single method of weed control will provide 100% control. A combination of two or more of the following methods should be used. The following practices can be applied to all species of weeds.

### **B4.1 Prevention**

An ounce of prevention is worth a gallon of sweat, 100 gallons of herbicide spray, several shovels, several pounds of grass seeds, and a ton of money. Weed problems can be avoided by using simple precautions.

Hay for mulch or erosion control should be certified weed seed free. Using weed seed free hay is mandatory for feeding pack animals in the National Forest. A list of certified growers can be obtained from National Forest Ranger Districts or the Colorado Department of Agriculture.

When disturbing weed infested land for development (e.g. blading) or agriculture (e.g. tillage), clean machinery and equipment before moving between sites. Equipment should be thoroughly cleaned before coming into a new site and before moving out of a weed infested area. In industrial situations, power washing is a good way to clean equipment. **DO NOT MOVE** soil from construction sites with known weed patches. Soil should be banked and used at the site. Emerging weeds should be treated accordingly.

Buy and plant noxious weed free seed. Laws require that containers (lots) of seed state the kind and percentage of noxious and other weed seed, and there are restrictions on the amount and kinds of weed seeds that are allowed in a lot. Over half of the weeds on the Colorado Noxious Weed List are escaped ornamentals. Do not buy ornamental seed mixes that do not give the scientific name of all the species in the mix. Check the scientific names against the list of

noxious weeds. If the package just says “toadflax” you don’t know whether or not you are buying a noxious species.

Eradicating single plants or small patches of weeds as soon as possible prevents their spread. In areas where the weeds are not yet present or are not very abundant, proper land management is necessary to keep the weeds out.

## **B4.2 Cultural Practices**

Cultural methods work on all species of weeds and are simply described as methods of sensible land management. Methods include improved land management practices, dense seeding with competitive species, crop rotation, careful irrigation practices, fertilization, and sensible grazing regimes.

New property owners should have their property assessed by a specialist. Growing conditions and land management practices in Western Colorado are very different from other regions of the country. Obviously, pasture and range lands are treated differently from lawn and garden areas. The intended use of the property will determine the best management practices for weed control. Even if you have owned your property for a long time, improvements probably can be made. Technical assistance is available from the Natural Resources Conservation Service or the CSU Cooperative Extension Office.

Competition with desirable plants can keep weeds suppressed and prevent weeds from becoming a problem. Plants compete for light, moisture and nutrients. Some weed species emerge early in the season to take advantage of these resources before natives or desirables. The choice of species used to provide competition for weeds depends on the intended use of the land, the types of weeds present, availability of irrigation water, soil types, and accessibility to the property. Native or non-native species can be used. In general, use a combination of species that will provide the best competition for the weeds that are present. It is generally better to plant grasses in broadleaf weed infestations so that a broadleaf herbicide can be used to treat the weeds if necessary. Some species of desirable plants are tolerant to herbicides. If irrigation water is not available, dryland species must be used. Seeding must be timed to take advantage of natural rain patterns to improve seed germination. Weed control will take much longer in dryland situations.

Proper water and fertility regimens are necessary to keep weeds from taking over. Over watering as well as under watering can lead to weed problems. Appropriate levels of fertilizer must be applied at optimal times in order to enhance desirable plant growth. Some species of weeds, such as Russian knapweed, diminish when water and fertilizer are properly managed.

Other management practices currently used on the property, such as grazing, may need to be adjusted to allow the desirable species to gain a foothold. Avoid overgrazing by livestock, including horses. When land is stripped of all plants by overgrazing, weeds are given the opportunity to move in. Because weeds are often undesirable as feed, they are sometimes the only plants left after livestock have overgrazed an area. Overgrazing gives them the light, space, water and nutrients they need to give them a competitive edge over desirable species. Do not allow overgrazing to happen. Be sure you have enough land for the number of grazing animals. Move livestock frequently to fresh pastures and allow pastures enough time to recover from grazing. Dividing up a pasture into three sections and moving animals between the sections can greatly improve conditions in an overgrazed pasture. Use a combination of perennial and annual, and warm and cool season pasture grasses to provide a diversity of plant types. Plant broadleaf pasture species only after broadleaf weeds are under control.

## **B4.3 Mechanical Control**

Mechanical control is the physical removal of a weed and includes methods such as hoeing, tilling, hand grubbing or pulling, mulching, burning, grazing, and mowing. Labor costs

can be considerable for large weed patches. Mechanical methods are more practical for small patches or scattered plants.

Mechanical control works well on annual and biennial weeds, but is much less effective on perennial species, unless they are in the seedling stage. Mechanical control is most effective when done before the plants have flowered. Annuals and biennials can be removed by severing the root at least 2 inches below the soil level. If flowers and seeds are mature, cut off flower heads and carefully place them in contractor's heavy duty black plastic bags. Setting bags in the hot sun for several hours will help destroy seeds. Burning the cut material works if the fire is hot enough to totally destroy the seeds. Check the ashes for intact seeds. For perennial species, mechanical means are not very effective unless you are sure that the plant is a young seedling and all the root system can be removed. Digging up perennial plants may cut the roots into small pieces that can sprout new plants.

When using machinery to till the land, till within the weed patch and then clean the equipment before moving to uninfested areas. Avoid tilling when the soil is wet. Mud sticking to the machinery will make cleaning difficult and will likely carry weed seeds to other areas.

Mulching works by killing seeds or smothering emerging weeds. Grass clipping, leaves, hay, seed hulls from industrial applications, plastic and many other materials can be used as mulch. Organic (carbon based) mulch must be weed seed free. Apply and maintain organic mulch several inches deep. Solarization, the application of clear plastic to damp ground and left for several weeks, can kill weed seeds and roots and some plant pathogens to 3 inches depth. This method also kills soil micro-organisms and insects that may be beneficial. Solarization works best on annual and biennial weeds. Reseeding with competitive species must follow mulching and solarization, regardless of the material or method used.

Burning standing dead weeds generally does not totally destroy weed seeds and may actually benefit some weed species. Burning newly emerging annual weeds may be effective but the flame must be hot enough and applied long enough to cause the plant cells to burst. Some species may recover from burning by putting out new shoots. Burning is not effective on perennial species because the root system is not affected. Avoid breathing fumes from burning weeds because some species contain compounds that are toxic when burned and can cause severe respiratory distress.

Grazing and mowing can be used successfully with some noxious weed species, primarily to reduce seed production. Mowing usually must be done several times per season. Both grazing and mowing should be combined with other methods, usually herbicide application. However, some species will flower at the grazed or mowed height. Grazing must be carefully timed for best results. Sheep, goats, and cattle can be used. Grazing is also considered a biological control method. Consult with an expert if you intend to use these methods.

#### **B4.4 Biological Control**

Biocontrol agents, such as herbivorous insects, vertebrate predators, and plant diseases, are not available for every weed species, nor are they effective in every situation. Generally, the weed patch must be large enough to sustain multiple generations of the agent. Effects may not be seen for several years, so the presence of the weed must be tolerated. Seed prevention methods may need to be combined with biocontrol to keep the weed from reproducing.

Biocontrol agents can be obtained from mail order sources or the Biological Control Section of the Colorado Department of Agriculture, Division of Plant Industry in Palisade. You should consult with a biocontrol or weed specialist before buying or releasing biocontrol agents.

Sheep and goats are used to manage some weed species and can be quite effective when used properly. Animals can be trained or conditioned to eat specific weeds and often leave desirable grasses alone. There are several grazing regimes that can be used, each with varying levels of intensity and duration. Grazing animals remove above ground growth and do not

directly affect roots. However, repeated grazing will stress the root system of perennials. Grazing in combination with herbicide application can be very effective. In areas where dense weed infestations prohibit the entry of spray equipment, grazing can open up the area to allow equipment in after some regrowth of the weeds has occurred.

## **B4.5 Chemical Control**

Herbicides must be used with extreme caution. They are poisons and should be treated with respect. Most herbicides can be purchased without an applicator license. The label is a legal document that outlines the uses and restrictions of the chemical. **READ THE LABEL** before buying, before applying and again after using an herbicide. **READ THE LABEL** before buying to determine if the herbicide is the right one for your situation, if it is labeled for the weeds you are trying to control, for information on the addition of adjuvant or surfactants, and for other restrictions, such as for grazing and planting. **READ THE LABEL** before applying to get the correct rate to use, how to mix and apply the product, what personal protection you may need while mixing and applying the herbicide, and for information on how to dispose of left over mix. **READ THE LABEL** after applying to check reentry intervals, to check planting and grazing restrictions, and for disposal and clean-up information.

Never use more than the recommended rate on the label. Higher rates will cause the tops of the plants to burn down quickly. The herbicide may not have the chance to move into the root zone and the weed may sprout again—and it's a waste of money!

Pre-emergent herbicides prevent the germination of seeds and do not work on established perennial weeds. Application timing of pre-emergents is critical; they are usually applied in the spring. Precipitation or irrigation may be needed to move the chemical into the germination zone (the top 3-5 inches of soil).

Post-emergent herbicides work on the growing parts of the weed, including roots. Therefore post-emergent herbicides work on annuals, biennials, and perennials. Drought and heat may reduce the effectiveness of these herbicides.

The herbicide label may require the addition of a surfactant (surface active ingredient) to the spray tank. Surfactants make the herbicide more effective by breaking down waxes on the leaf surface, helping the spray spread on or stick to the plant, or aid in penetration of the spray into the leaf. Read the label to determine if a surfactant is needed and what type to purchase. These products are usually inexpensive and do result in better weed control.

The use of herbicides may be the only effective control method for some species. However, herbicides should be used in conjunction with other methods to achieve the highest level of control.

Herbicide use is determined by restrictions and instructions on the product label. Materials or products mentioned in this Plan are based on experience in Mesa County or recommendations of Colorado State University Cooperative Extension Service and should not be construed as endorsement by Mesa County.

## **B5 Noxious Weeds of Mesa County: A Management Guide**

### **Bull Thistle (*Cirsium vulgare*)**

**County Management Strategy:** Contain infestations above approximately 7,000 feet elevation. Eradicate infestations below approximately 7,000 feet elevation.

**Identification:** A tap rooted, biennial, spiny leaved thistle with large dark purple flowers clustered at the ends of branches. First year growth is a low growing rosette of leaves. In the second year it blooms from June through the summer. The vase shaped flowerheads are 1½"-2"

in diameter. Bull thistle grows 2-5 feet tall and has very green leaves with pointed lobes. Leaves have a cottony underside.

**Other names:** Common thistle, spear thistle

**Similar Species:** The rosette of musk thistle is similar but not as green as bull thistle. Flowers of other thistles are not vase shaped, but more open and less compact. *Cirsium traceyi* (formerly *C. undulatum* and commonly called wavy leaf thistle), a native thistle often confused with bull thistle, has paler purple flowers and silver gray leaves.

**Control Timing:** Control plants before they bolt, in the spring. Rosettes should be killed manually or with herbicides in the spring or fall. Plants that are bolting should be removed manually or sprayed as soon as possible. Flowering plants should be removed manually and mature flowerheads bagged to prevent seed spread.

**Control target:** Prevent seed production.

**Control Methods:** Severing the tap root at least 2" below the soil line before flowering is very effective. Herbicides can be used in the rosette to early bolting stage. Flowering plants should be chopped and bagged to prevent spread of seeds.

**Status in Mesa County:** Scattered and occasional; in pastures, waterways, and disturbed sites.

### **Canada Thistle (*Cirsium arvense*)**

**County Management Strategy:** Suppression throughout the County.

**Identification:** A deeply rooted, perennial weed that spreads from rhizomatous roots and also produces large numbers of seeds. Leaves are alternate on the stem with spines along the edges. The edges of leaves are highly variable and can be wavy-edged on one plant and deeply lobed on another. The purple flowers are small, about 1/2" to 3/4" in diameter, and grow in a cluster at the branch tips. Flowers may have a sweet smell and are visited by bees and other pollinators. Plants grow 1-4 feet tall and are usually found in large clumps. Canada thistle is commonly found in moist soil conditions.

**Other names:** Creeping thistle, field thistle

**Similar Species:** Several species of native thistles are mistaken for Canada thistle. Identification by a professional is essential. A rare native species, *Cirsium perplexans*, is similar but is a tap rooted, not rhizomatous, perennial. Flowers are borne singly rather than in clusters. Plants do not typically grow in clumps like Canada thistle. *Cirsium traceyi* (formerly *C. undulatum* and called wavy leaf thistle), another native thistle often confused with Canada thistle, has larger, paler purple flowers and silver gray leaves.

**Control Timing:** Spring and fall.

**Control target:** Prevent seed production and stress root system.

**Control Methods:** Control of Canada thistle is difficult. Herbicides are most effective, often in combination with mowing to reduce seed production. Fall application of herbicides is recommended. Digging and tillage are ineffective and may cause the plant to spread or produce more stems. Seeding with competitive desirable grasses is highly recommended. See CSU Extension Service Fact Sheet No. 3108 for more information on control methods. Biocontrol agents are available but releases have not resulted in large scale control locally.

**Status in Mesa County:** Problem in higher elevation forest lands, high country meadows and pastures, and along seeps and drainages. A few patches occur at lower elevations, primarily in wet or disturbed sites.

### **Dalmatian Toadflax (*Linaria dalmatica*):**

**County Management Strategy:** Suppression on Mormon Mesa, Parker Basin and Big Creek. Eradication elsewhere in the County.

**Identification:** A perennial plant growing 1-3 feet tall with showy, yellow snapdragon-like flowers. Leaves are very waxy, heart shaped and the upper leaves clasp the stem. Flowers arise

in the axils of the leaves and have a yellow spur and fuzzy orange throat. Seed production is very high.

**Other names:** None

**Similar Species:** Many ornamental snapdragons look like toadflax, since it is in the same family. Narrow leaved Dalmatian toadflax has similar flowers but linear leaves. Yellow toadflax has linear leaves, paler flowers and linear leaves.

**Control Timing:** During summer when flowerheads are first appearing; in the fall when at least 25% of stems are turning yellow.

**Control Target:** Prevent seed production and stress root system.

**Control Methods:** Repeated hand grubbing can be effective for small infestations. Large infestations require herbicide use and competitive planting. A surfactant or adjuvant must be added to the herbicide mix to break through the waxy leaf surface. Several biocontrol agents are available but need large infestations and a long establishment time. This is a difficult weed to control via any method. CSU Extension Service Fact Sheet No. 3.114 has more details on control of Dalmatian and yellow toadflax.

**Status in Mesa County:** Found in high numbers on Mormon Mesa near Molina, in Parker Basin and along Big Creek south of Collbran and on nearby road rights-of-way. A few plants have been found and eradicated on I-70 from the Grand Mesa exit to the Utah State line. A small infestation exists on Glade Park but is being treated and does not appear to be spreading.

**REPORT INFESTATIONS TO THE DIVISION OF PEST MANAGEMENT!**

### **Diffuse Knapweed (*Centaurea diffusa*)**

**County Management Strategy:** Eradication throughout the County.

**Identification:** An annual or short lived perennial weed that is profusely branched and grows to 2 feet tall. Rosette and stem leaves are deeply lobed. Produces numerous white to pale lavender flowers that bloom in early to mid summer. Bracts below the petals are spine tipped, with comb-like spines and are prickly to the touch. Plants break off at the base and become tumbleweeds, facilitating seed spread.

**Other names:** None

**Similar Species:** Russian knapweed stem leaves are not lobed and its flowers are darker purple. Spotted knapweed has spots on the bracts below the flowers. There is some evidence that diffuse and spotted knapweed can interbreed and both species can be found growing in the same patch.

**Control Timing:** In the spring and early summer during the rosette or very early bolting stages.

**Control target:** Prevent seed production.

**Control Methods:** Mechanical removal is effective on rosettes and plants in the early bolting stage. Herbicides are effective tools if applied before flowering. Once the plants have flowered, they should be removed manually and bagged to prevent seed spread. Biological control is not recommended in Mesa County because eradication is the management goal for this species.

**Status in Mesa County:** An infestation exists at the Garfield/Mesa County line on I-70 and frontage roads and south-southwest of Debeque. It has been found on private property on Silt Divide Road (48.5 Road). Scattered plants may exist along I-70 throughout Mesa County. Infestations exist in the Bookcliffs on Bureau of Land Management land; it is being treated. A large infestation was found in 1998 on property owned by Public Service Company (Excel Energy) located east of 34 Road on C Road. This patch is being controlled with herbicides and digging and is being monitored by the Mesa County Division of Pest Management. **REPORT INFESTATIONS TO THE DIVISION OF PEST MANAGEMENT!**

### **Dyers Woad (*Isatis tinctoria*)**

**County Management Strategy:** Eradication throughout the County.

**Identification:** Woad is an annual or short lived, tap rooted perennial mustard growing up to 48 inches high. The tap root may reach to a 5 foot depth. Leaves are bluish-green, lanceolate (strap

shaped) and are connected to the stem by a petiole. The leaf has a whitish nerve or vein visible on the upper surface. Flowers are numerous, yellow and very small. The seed pods are very diagnostic, being extremely large for a mustard, flattened and very dark. Each pod contains a single seed.

**Other names:** Woad

**Similar Species:** Many mustards have yellow flowers and similar leaf structure. The large black seed pods are the best way to tell this from other mustards.

**Control Timing:** During the rosette stage (fall or spring) and before flowering.

**Control Target:** Prevent seed production.

**Control Methods:** Manual removal is usually a good method for annual plants. However, dyer's woad will regenerate from its tap root if the root is not completely removed. Rosettes should be killed manually or with herbicides in the spring or fall. Plants that are bolting should be removed manually or sprayed as soon as possible.

**Status in Mesa County:** One plant was found in the dye garden at the Botanical Gardens in Grand Junction; it was removed. It is a serious and expanding problem in Utah. **REPORT INFESTATIONS TO THE DIVISION OF PEST MANAGEMENT!**

### Goatshead (*Tribulus terrestris*) see Puncturevine

### Hoary Cress or Whitetop (*Cardaria draba*)

**County Management Strategy:** Suppression throughout the County.

**Identification:** A perennial mustard with an extensive root system and growing up to 2 feet tall. Plants form a dense, contiguous patch. Leaves are slightly toothed, with upper leaves clasping the stem. Numerous small white flowers form a flat-topped flowerhead. Seed pods are heart shaped and contain 2 seeds each.

**Other names:** Globe-podded hoary cress, globe-podded whitetop, perennial peppergrass

**Similar Species:** There are many white flowered mustards in our area, however none of them have a dense, flat topped flowerhead. Lens-podded hoary cress (*C. chalpensis*) and globe podded hoary cress (*C. pubescens*) occurs in our area and is difficult to distinguish from whitetop; they are treated the same. Perennial pepperweed, or tall whitetop, is much taller, the flowerheads are less dense than hoary cress, and it blooms in mid to late summer.

**Control Timing:** Before or at very early bloom.

**Control Target:** Prevent seed production and stress root systems.

**Control Methods:** Herbicide applications can be very effective on hoary cress when applied at the proper time. Tillage or hand grubbing break up root pieces, which can sprout into new plants. No biocontrol agents are available.

**Status in Mesa County:** Widespread in lower elevations in the Grand Valley but spreading to higher areas such as Collbran. Common on roadsides. Hoary cress and Russian knapweed are the County's two most abundant noxious weeds.

**Toxicity:** DO NOT HANDLE hoary cress with bare hands as it has been known to cause a rash and sensitivity to the sun.

### Houndstongue (*Cynoglossum officinale*)

**County Management Strategy:** Suppression above approximately 7,000 feet elevation. Eradication below approximately 7,000 feet elevation.

**Identification:** Houndstongue is a biennial plant with rough hairy leaves that can be 1-12 inches long and 1-3 inches wide. Flowers can be maroon or white, are about 1/4" in diameter, and appear bell shaped. The seed pods (nutlets) are covered with hooked spines and provide a mechanism for dispersal on clothing and fur. The pods are flattened and somewhat heart shaped. A common name locally is beggar's lice.

**Other names:** None

Revised November 2009

**Similar Species:** Other plants with sticky seeds, such as nodding beggar's tick, western sticktight and catchweed bedstraw, can be confused with houndstongue. The shape of the seeds and/or the presence of stout straight spines on the seeds can distinguish these from houndstongue.

**Control Timing:** In the rosette or early bolting stage.

**Control target:** Prevent seed production.

**Control Methods:** Mechanical removal is very effective for small infestations, particularly after plants have bolted, when herbicides may not be as effective. Rosettes should be killed manually or with herbicides in the spring or fall. Plants that are bolting should be removed manually or sprayed as soon as possible. Flowering plants should be removed manually and mature flowerheads bagged to prevent seed spread. Beware to remove all seeds from clothing, shoes, shoelaces, etc. No biological agents are available for this species.

**Status in Mesa County:** Found in pastures, forests and roadsides, primarily in higher elevations of eastern Mesa County, particularly in the Battlement Mountains north of Collbran.

**Toxicity:** Houndstongue is extremely toxic to cattle and horses, less so to sheep. It produces alkaloids that cause liver damage.

### **Leafy Spurge (*Euphorbia esula*)**

**County Management Strategy:** Eradication throughout the County.

**Identification:** A perennial with extensive, deep, creeping rootstocks. Roots are dark brown with pink shoot buds. Leaves are linear and about 1-1½ inches long. Flowers are inconspicuous and green. At the base of the true flowers, and emerging before them, are bright yellowish-green bracts that are often mistaken for the flowers. It is very important to distinguish these two stages for timing control work. Seeds are in a pod, which when dry expels the enclosed seeds up to 15 feet. The plants have a milky latex sap which is very toxic.

**Other names:** Spurge

**Similar Species:** Leaves are similar to yellow toadflax. Other spurges in our area are either low growing (prostrate spurge) or have broad, toothed leaves (toothed spurge). Many plants have milky sap so this is not a good diagnostic tool.

**Control Timing:** When bracts are present but before true flowers emerge (late spring) and in the fall.

**Control target:** Prevent seed production and stress root system.

**Control Methods:** Herbicides and competitive plantings are the most effective methods of control for leafy spurge. Small infestations should be sprayed immediately and repeatedly after allowing regrowth to occur. CSU Extension Fact Sheet No. 3.107 details control methods. Grazing by goats has worked well in some situations. Several species of *Apthona* flea beetles have proved to be very effective in some parts of the country. However, biological control is not recommended in Mesa County because eradication is the management goal for this species. Large infestations are the best candidates for release of biocontrol agents. Application of herbicide to the perimeter of a infestation may be necessary to keep the weed from spreading while the beetles establish and build their numbers.

**Status in Mesa County:** Current infestation is in the Plateau Valley area near mile marker 3 on Highway 330. A small infestation was found in 2001 west of the town of Mesa. A ¼ acre patch was found in 2007 south of Mesa. A small, dwindling population also occurs in Unaweep Canyon, west of the Divide Road turnoff.

**Toxicity:** The milky sap of leafy spurge can cause skin and eye irritation in humans and other animals. It can cause death of livestock. The toxicity remains even after the plants are dried.

Caution must be taken when handling this weed. **REPORT INFESTATIONS TO THE DIVISION OF PEST MANAGEMENT!**

### **Musk Thistle (*Carduus nutans*)**

Revised November 2009

**County Management Strategy:** Contain infestations above approximately 7,000 feet elevation. Eradicate infestations below approximately 7,000 feet elevation.

**Identification:** A bushy biennial plant that grows to 6 feet tall. The dark green leaves have spines along the edges and are lobed and wavy. Rosette leaves are spiny with a white central vein that is very visible on the underside. Leaves often have a whitish edge. The leaves clasp the stem and form “wings” along the stem below the leaf. Flowers are borne singly on long spineless stems. The flowers are deep pink to magenta and 1½ to 3 inches in diameter with very broad green or somewhat magenta bracts below the petals. When mature, the flowers “nod,” hence the other common name, nodding thistle.

**Other names:** nodding thistle, plumeless thistle, nodding plumeless thistle

**Similar Species:** Plumeless thistle, another noxious species, has spined “wings” along the stem below the flowerhead and the flowers may occur in clusters of 2-5 flowers. Bull thistle, another noxious species, is shorter and the lobes of the leaves are sharply pointed and at right angles to the main vein. None of our native thistles are similar to musk thistle.

**Control Timing:** In the rosette (spring and fall) and early bolting stage.

**Control target:** Prevent seed production.

**Control Methods:** Severing the tap root at least 2" below the soil line before flowering is very effective. Herbicides can be used in the rosette to early bolting stage. Flowering plants should be chopped and bagged to prevent spread of seeds. Several insect species are available for biological control.

**Status in Mesa County:** Widespread in higher elevations of Mesa County in disturbed areas, on roadsides and in pastures. Occasionally found in lower elevations in Mesa County.

### **Oxeye Daisy (*Chrysanthemum leucanthemum*)**

**County Management Strategy:** Suppression above approximately 7,000 feet elevation. Eradication below approximately 7,000 feet elevation.

**Identification:** A perennial, white flowered daisy with creeping roots growing to 2 feet tall. Leaves have toothed edges and are 2-5 inches long, getting smaller toward the top of the plant. The flowers are 1½ inches in diameter and borne singly on the ends of branches. The yellow disk of the flower has a round depression in the middle.

**Other names:** marguerite

**Similar Species:** Shasta daisy is a common ornamental daisy with larger leaves and flowers. Two noxious weeds, scentless and Mayweed chamomile have fern-like leaves and have flowers with an inflated disk (central part of the flower).

**Control Timing:** In the spring before flowers appear and in the fall.

**Control target:** Prevent seed production and stress root system.

**Control Methods:** Herbicides have been shown to be the most effective control method. Mechanical removal may stimulate shoot production from the rhizomatous roots. No biocontrol agents are available for this weed.

**Status in Mesa County:** Fairly common in pastures in higher elevations of eastern Mesa County, and in some flowerbeds in lower elevations. Oxeye daisy may still be found for sale as seed, in wildflower seed mixes, or as bedding plants. It is illegal to sell this species in Colorado. Report seed sales to the Colorado Department of Agriculture Conservation Services Department.

### **Plumeless Thistle (*Carduus acanthoides*)**

**County Management Strategy:** Eradication throughout the County.

**Identification:** An annual, highly branched, tap rooted biennial thistle growing up to 4 feet tall. Rosette leaves are 4 to 8 inches long, green, with spined lobes. Stem leaves have “wings” that grow to the stems. Flower stems also winged. The purple flowers are either solitary or in a cluster of 2-5. Flowers rarely white or yellowish. Bracts under the petals are hairy and narrow.

**Other names:** spiny plumeless thistle

**Similar Species:** Musk thistle has larger bracts and flowers, and the flower stems are not winged. Bull thistle is shorter and not as spiny with more compact flowers. Flowers of the rare native species, *Cirsium perplexans*, are borne singly rather than in clusters and the stems are not profusely winged. *Cirsium traceyi* (formerly *C. undulatum* and called wavy leaf thistle), another native thistle, is not very branched, has silver gray leaves and the stems are not winged.

**Control Timing:** In the rosette and early bolting stages.

**Control target:** Prevent seed production.

**Control Methods:** Severing the tap root at least 2" below the soil line before flowering is very effective. Herbicides can be used in the rosette to early bolting stage. Flowering plants should be chopped and bagged to prevent spread of seeds. Several insect species are available for biological control. However, biological control is not recommended in Mesa County because eradication is the management goal for this species.

**Status in Mesa County:** Infestations have been found in Devil's Canyon near Fruita, in the Brush Creek area east of Collbran and in Rifle (Garfield County). Otherwise it is not widespread in Mesa County. **REPORT INFESTATIONS TO THE DIVISION OF PEST MANAGEMENT!**

### **Puncturevine/Goatshead (*Tribulus terrestris*)**

**County Management Strategy:** Suppression throughout the County.

**Identification:** Tap rooted annual weed. Low growing, spreading plants with very small compound leaves arranged similarly to pea plants (legumes). Flowers are yellow, 3/8" in diameter, and shiny, with pointed petals. Seed pods form a "goatshead" with 5 stout sharp spines.

**Other names:** caltrop, bullhead, tackweed, Mexican sandbur

**Similar species:** Many other weeds are called goatshead but none have similar seed pods. Similar species include prostrate knotweed, prostrate spurge. Knotweed does not form seed pods. Spurge has milky sap.

**Control Timing:** As soon as seedlings are noticed, usually in late June or July.

**Control Target:** Prevent seed production.

**Control Methods:** Digging, hoeing, tillage in seedling stage. Herbicides before seed set. Biological control agents are available for this species.

**Status in Mesa County:** Common in waste areas, roadsides, driveways, desert trails and disturbed areas in lower elevations of Mesa County. Starting to show up near Mesa and Collbran.

**Toxicity:** Toxic to livestock when consumed in large quantities.

**Impact:** Punctures bicycle tires. Can get stuck in feet of pets, children and adults. Easily spread by all methods of transportation.

### **Purple Loosestrife (*Lythrum salicaria*) -**

**County Management Strategy:** **This species must be eradicated statewide.**

**Identification:** A perennial with creeping, rhizomatous roots that grows up to 10 or more feet tall. A wetland invader, it thrives in moist conditions. Leaves are lance shaped with veins that do not reach the edge of the leaf but parallel the edge. The very showy purple to magenta flowers grow on long stalks and have 5-7 petals each. The ribbed stems are square or 6-sided. Also called purple lythrum.

**Other names:** purple lythrum, rainbow weed, spiked loosestrife, salicaire

**Similar Species:** An uncommon native loosestrife is shorter and more delicate, with fewer flowers. Gayfeather or blazing star, a native plant, has coarse, more linear leaves that are much narrower than loosestrife. Fireweed, a common native plant, has only 4 petals per flower, a round stem and the flower heads form an elongated triangle.

**Control Timing:** Before or during early flowering in the spring, and in the fall. Mature flowerheads must be removed before the first frost.

**Control target:** Prevent seed production and stress root system.

**Control Methods:** Mechanical control can be effective for small infestations but must be repeated, often for five years or more. Timing of herbicide applications is important. Early summer applications should be done just before flowering to prevent flowering and seed set. Fall applications can be done from late August through September, but before a hard freeze. Flowerheads must be removed to prevent spread of seeds. Several biocontrol agents are available, but establishment is dependent on proper regulation of water levels and may work better in drier habitats. Biological control agents are available, however, it is not recommended in Mesa County because eradication is the management goal for this species.

**Status in Mesa County:** Large infestations occur along Tiara Creek on the Redlands. Smaller infestations occur along Goat Draw on Redlands Parkway, on several private properties on the Redlands, in Walter Walker Wildlife Area and on several private properties near Fruita. Scattered plants are found along the Colorado River from Grand Junction to Moab, Utah. The spread of the weed to riparian areas along the River are of extreme concern to public lands managers. Mesa County cooperates with landowners and state and federal agencies to eradicate this weed. **REPORT INFESTATIONS TO THE DIVISION OF PEST MANAGEMENT!**

### **Russian Knapweed (*Acroptilon [Centaurea] repens*)**

**County Management Strategy:** Suppression throughout the County.

**Identification:** A rhizomatous perennial weed with a silvery green appearance, growing up to 3 feet tall. Rosette leaves are lobed and about 3-5 inches long. Stem leaves are linear, not toothed, and about 1 to 2 inches long. Flowers appear in May to June and occasionally late summer. They are purple and about ½ inch in diameter. The bracts below the petals are soft and greenish tan. Roots are black and scaly. Seedheads remain intact throughout the winter. Leaves and possibly roots of Russian knapweed release an allelopathic chemical to the soil, which prevents other species' seed from germinating .

**Other names:** Turkestan thistle, hardheads

**Similar Species:** Diffuse and spotted knapweed have similar flowers, but both have fern-like leaves throughout and the bracts under the flowers differ from Russian knapweed. Purple aster (*Aster macaeranthera*) has very green leaves, the flowers have a yellow center and it blooms in the late summer and early fall. Seeds are released from the seedhead before the plant dies back in the fall.

**Control Timing:** In the bud to bloom stage and in the late summer and fall.

**Control target:** Prevent seed production and stress root system.

**Control Methods:** Herbicides are the only method known that provides good control results. Repeated pulling or digging may work for very small or new infestations, but must be done over a long period of time. Tillage, other than that necessary for seeding competitive plants, spreads small root pieces that can then sprout into new plants, resulting in a denser infestation. Planting competitive plants is necessary following herbicide application. The soil must be tilled and left for a week or two before planting to allow the knapweed's allelopathic chemical to dissipate. CSU Extension Service Fact Sheet No. 3.111 details control methods and seeding recommendations. No biological control agents are available for this species.

**Status in Mesa County:** Widespread in lower elevations of Mesa County. Some patches are beginning to show up in higher elevations. Very abundant on the Dolores, Gunnison and Colorado Rivers. Occurs on roadsides, in degraded pastures and range, on neglected farmland, and in disturbed sites. Hoary cress and Russian knapweed are the County's two most abundant noxious weeds.

**Toxicity:** Russian knapweed is toxic to horses, causing nigropallidial encephalomalacia, a Parkinson's-like neurological disease that results in the inability to chew followed by starvation. Although toxicity to humans is undocumented, cases of tumors, illness from breathing smoke from burning plants, and a garlic-like taste in the mouth have been reported. It is essential to wear gloves when working with this plant. **AVOID BREATHING FUMES FROM BURNING**

**RUSSIAN KNAPWEED – IT HAS BEEN REPORTED TO CAUSE RESPIRATORY DISTRESS.**

**Scotch Thistle (*Onopordum acanthium*)**

**County Management Strategy:** Suppression above approximately 6,000 feet elevation. Eradication below approximately 6,000 feet elevation.

**Identification:** A biennial, tap rooted weed that grows to 12 feet. Rosette leaves are very large (1 to 2 feet long and 6 to 12 inches wide), spined and with a dense coating of white hairs that give the leaves a silvery green appearance. The numerous flowers are magenta and 2 inches or more in diameter. Stems are winged, including stems under the flowerheads. Truly an enormous plant.

**Other names:** Cotton thistle, Scotch cotton thistle, heraldic thistle

**Similar Species:** No other thistles reach this size or have leaves or flowers this large.

**Control Timing:** In the rosette stage in spring and fall.

**Control target:** Prevent seed production.

**Control Methods:** Mechanical control is very effective in the rosette stage, if the root is severed at least 2 inches below the soil line. Roots are very thick in the second year and may need to be chopped. Herbicides can be effective but must be applied to the young rosette. The older the plant gets, the more difficult it is to control with herbicides because the hairiness of the leaves prevents the herbicide from landing on the leaf surface. The addition of a surfactant or adjuvant is recommended. No biocontrol agents are available at this time. Extensive feeding by painted lady butterfly larvae may be seen some years, but is not a reliable control method.

**Status in Mesa County:** A serious problem in the Collbran and Mesa areas. Increasing number of infestations are showing up on Highways 65 in Plateau Valley and on I-70. An isolated infestation was found on Glade Park. A few plants are found occasionally in lower elevations of Mesa County.

**Spotted Knapweed (*Centaurea maculosa*)**

**County Management Strategy:** Eradication throughout the County.

**Identification:** A biennial or short lived perennial weed that is profusely branched and grows to 3 feet tall. Plants have a stout tap root. Rosette leaves strongly lobed or not and 3 to 6 inches long. Flowers are pink to magenta, rarely white, and occur singly on the tips of branches. Bracts below the flower petals have dark, toothed margins that look like spots.

**Other names:** None

**Similar Species:** Diffuse knapweed has a comb-like fringe on the bracts and no spots. Russian knapweed has soft, greenish-tan bracts without a fringe or spots. There is some evidence that diffuse and spotted knapweed can interbreed and both species can be found growing in the same patch.

**Control Timing:** In the spring during the rosette or early bolting stage.

**Control target:** Prevent seed production.

**Control Methods:** Mechanical control may work for small infestations, but must be repeated because shoots can arise from the tap root. Digging up the entire root is preferable but labor intensive. Tillage at the rosette stage can be effective. Herbicides are effective if applied to the rosette stage. Mature flowers should be removed and bagged to prevent seed spread. A few biocontrol agents are available, including seed and stem feeders. However, biological control is not recommended in Mesa County because eradication is the management goal for this species.

**Status in Mesa County:** Very small infestations exist in Mesa County on Glade Park, on Silt Divide Road, on Lands End Road, and on Highway 65 north of Powderhorn. Scattered infestations are being treated in the Bookcliffs near the Garfield County line. Often found growing with diffuse knapweed. **REPORT INFESTATIONS TO THE DIVISION OF PEST MANAGEMENT!**

**Tamarisk or Salt Cedar (*Tamarix parviflora*, *T. ramosissima*)**

**County Management Strategy:** Biological control throughout the County.

**Identification:** A small tree or shrub growing up to 20 feet tall, with feathery leaves and tiny purple to white flowers. May be deciduous or evergreen, but mostly deciduous in our area. This plant grows in riparian areas and wetlands, often depleting surface water and lowering ground water levels. Salt is released from the leaves when they drop in the fall, making the soil in the understory highly alkaline.

**Other names:** Small flower tamarisk, tamarix, tamarack (locally)

**Similar species:** No other shrub is similar in appearance to these *Tamarix* spp.

**Control timing:** Year round, with best success in fall and winter with cut-stump and basal spray treatments.

**Control target:** Prevent seed production and stress root system.

**Control methods:** A detailed tamarisk control publication is available at CSU Cooperative Extension or the Division of Pest Management. Brush hogging and burning lead to less successful control due to the vigorous regrowth that occurs. Cutting down the shrub or tree in the fall, winter or spring and painting the stump surface immediately afterward with an herbicide (cut stump treatment) is the most effective control method. Herbicide must be applied within 10-15 minutes of cutting to prevent excessive resprouting from the stump. Follow up herbicide application is needed to treat sprouts from the root system. This usually will only be necessary for 2-4 years. All branches and trunk pieces must be removed from the site to prevent sprouting. Tamarisk branches touching wet ground have been known to sprout and send down new roots. Chipping or burning the slash is recommended. The basal 12-18 inches of the trunks of young plants with smooth bark can be sprayed with herbicide (basal bark treatment). Rough barked plants should get the cut stump treatment. Foliar sprays during the growing season must cover the entire leaf surface to be effective and will take 3-4 years of repeated treatment to be successful. "Root plowing" may be effective in certain areas, but care must be taken to remove the root below the crown. This method disturbs a large area of ground and should be used only in large dense stands where no native plants occur. A leaf feeding beetle (*Diorhabda elongata*) is currently established and spreading along the Dolores and Colorado Rivers. Several years of defoliation by the insects are necessary to kill the plant.

**Status in Mesa County:** Tamarisk is a plant that is "preferred to be controlled", rather than "mandatory for control" in Mesa County. It is widespread throughout the county in most riparian zones of permanent and ephemeral streams. Although thought to be a lower elevation plant, tamarisk has been found on Douglas Pass in Garfield County and near McClure Pass in Gunnison County.

**Yellow Starthistle (*Centaurea solstitialis*) County Management Strategy:** Eradication throughout the County.

**Identification:** A tap rooted annual weed growing to 2 feet tall. The rosettes are 6 to 8 inches across and look very similar to a dandelion rosette. Rosette leaves have a distinct triangular tip. The yellow flowers are about ½ inch wide and bloom throughout the summer. Seed production is very high. Bracts at the base of the petals are armed with stout spines up to 1½ inch long. No other part of the plant has spines. Leaves are reduced and grayish green. Plants are much branched and spindly looking.

**Other names:** None

**Similar Species:** Curlycup gumweed is much greener, rosette leaves are less lobed, and the flower bracts are not armed with spines, but have curled, soft bract tips. Buffalo bur, a native weedy species, has spines all over the leaf and stem surfaces, and has yellow bell shaped flowers. The leaves are broad and deeply lobed. Several other species in the aster family, such as wild lettuce, sowthistles, and dandelions, have yellow flowers but none are stoutly spined.

**Control Timing:** In the rosette to early bolting stage during spring and early summer.

**Control target:** Prevent seed production.

**Control Methods:** Mechanical control works well on small infestations but is labor intensive for large infestations. Herbicides can be applied during the rosette to early bolting stage. Repeat applications are necessary because the seeds germinate over the entire summer. A seedhead fly, accidentally introduced to California, feeds on seeds but is currently not available. However, biological control is not recommended in Mesa County because eradication is the management goal for this species. Good pasture management is necessary to keep starthistle populations from exploding.

**Status in Mesa County:** There is a large area of infestation south of the town of Mesa in the Coon Creek Estates area. A smaller infestation occurs on Glade Park on DS Road about 3 miles east of the state line. Mesa County is actively involved in monitoring infestations and working with landowners on eradication of these patches. **REPORT INFESTATIONS TO THE DIVISION OF PEST MANAGEMENT!**

### **Yellow Toadflax (*Linaria vulgaris*)**

**County Management Strategy:** Eradication throughout the County.

**Identification:** A creeping perennial that grows up to 2 feet tall and is often profusely branched. The flowers look like typical snapdragons, with a pale yellow spur and darker yellow to orange throat. The numerous leaves are linear and pointed. Also called butter and eggs, this is a very persistent plant.

**Other names:** Butter and eggs, Jacob's ladder, flaxweed, wild snapdragon

**Similar Species:** Dalmatian toadflax has heart-shaped leaves and the stems are not branched. Narrow-leaved Dalmatian toadflax has narrow leaves but has Dalmatian colored flowers. Many ornamental snapdragons look like toadflax, since it is in the same family. Yellow toadflax has linear leaves. Our native toadflax has blue flowers.

**Control Timing:** Before flowering and in the fall.

**Control target:** Prevent seed production and stress root system.

**Control Methods:** This is a very difficult plant to eradicate. The extensive root system must be stressed continually. Mechanical control is often not effective on larger patches, and may spread root pieces. Herbicides are effective but choice of product and control timing is very important. CSU Extension Service Fact Sheet No. 3.114 has more details on control of Dalmatian and yellow toadflax. Biological control agents are available but biological control is not recommended in Mesa County because eradication is the management goal for this species.

**Status in Mesa County:** A few small infestations appear to have been eradicated at Vega State Park. One small patch was eradicated at the County owned boat take-out on the Gunnison River near Whitewater. A small patch was found on Skipper's Island in 2001 and on 25 Road and G 5/8 road north of Grand Junction. Occasional plants are found along the Colorado River.

**REPORT INFESTATIONS TO THE DIVISION OF PEST MANAGEMENT!**