

APPENDIX 3

WEED MANAGEMENT PLAN OUTLINES

Weed Management Plan Outline For Small Properties

Purpose: This is a simplified weed management template that is specifically designed for small properties/areas. It is designed to help landowners discover which weed species they have on their property and help them develop a plan to manage weeds that are high priorities. It is intended for a landowner's personal use and is not designed to "market" or "justify" a weed management plan to a board or organization.

Date _____

Name of Landowner or Property _____

Approximate Size of Property _____

1.0 Management Goals: Management goals describe the purpose/use of the property and what you are trying to achieve. Having clear management goals is key to developing a weed management plan. (A management goal may be to produce rangeland forage to support a cow-calf operation and to eliminate weeds that are poisonous or troublesome to livestock. Another management goal may be to restore an area with native vegetation and promote wildlife habitat.)

Management Goal(s): _____

2.0 Weed Control Objectives: Objectives are derived from your management goals. They are formed by inventorying the weeds you have on your property, determining how they affect your management goals (For example, does the weed reduce forage? poison livestock? or crowd out native species?), and determining the most efficient ways to control those weeds. Sometimes a weed control objective will be to simply contain an infestation so that it does not become a problem, or to keep certain weeds off of your property.

Knowing which weed species occur on your property and where they are located is very important in developing control priorities. Weed species vary considerably in the threat that they pose to the resource values of the property. In addition, weed species vary greatly in their susceptibility to control measures. Thus, weed species that pose the greatest threat to achieving the management goals for the property and which can be most easily controlled are the highest priority for management.

To create weed control objectives for your weed management plan, first search your property for weeds (if you have not already done so), then fill out the attached Weed Management Table.

2.1 Weed Management Table (see table 2.1):

- 1) Search the property and fill in columns 1-3 in the table paying particular attention to which weed species are present on your property, how large the infestations are, and where on the property they are located.
- 2) Read the weed species profiles for the species you identified and fill out columns 4-7 in the table. These weed profiles are found in the Appendix to this guidebook.
- 3) Move on to Section 2.2 to determine the management priority of each weed species.

2.2 Prioritizing Weed Species: Determine the management priority of each weed species on your property by using the Alien Plants Ranking System outlined in Appendix 6 of this handbook, or by consulting your County Weed Supervisor. Species that have the highest priority for management should receive a “priority check” in the table, and should be controlled first. Use the information in the table about the weed’s “life cycle” (emergence and flowering) to coordinate the most efficient times and methods of control. (For example, several species on your list may be controlled best when cut or pulled after bolting but before seed production. If these species have similar life cycle characteristics they can all be controlled at the same time. Coordinating control methods in this manner will help save time, resources and/or money.) Once you have prioritized the species that should be controlled, and selected the most efficient time and method to control, you can write your weed control objectives.

2.3 Weed Control Objectives

1st Weed Control Objective: _____

2nd Weed Control Objective: _____

3rd Weed Control Objective: _____

3.0 Evaluating Weed Control: After you have created weed control objectives and have begun to control the priority weed species on your property, you should evaluate the results of your control methods. This requires follow-up visits to the areas where weeds were controlled and a re-assessment of the size and density of an infestation. (For example, compare the size of the infestation after a growing season has elapsed to the size before control actions were initiated.) In most cases, the elimination of an infestation will take several years with multiple treatments per year to kill the plants and eliminate the bank of weed seeds in the soil.

		Have the infestation(s) decreased or increased? By what measure?*			How much time was spent on weed control?	How much money was spent on weed control?
		Infestation size	Weed density	Weed vigor		
Year 1 ()	Species					
Year 2 ()	Species					
Year 3 ()	Species					

*Use consistent terms like larger, smaller, higher, lower, or about the same throughout the table.

4.0 Analyzing the Effectiveness of Weed Management: After you have analyzed the control results (in some cases over the course of several years), you can determine if the weed control objectives helped you achieve your management goal(s). Make sure to consider the cost of control compared to the benefits realized from the weed control. If the benefits of control did not outweigh the cost, it might be better to create new objectives or try other control methods. (For example, it may be more cost effective to use containment and prevention techniques to maintain the current level of weed infestations and to prevent an increase in weed populations.)

2.1 -- Weed Management Table(s)

Column 1	2	3	4	5	6	7	8
Name of weed	Location(s) on property	Approximate size(s) of infestation(s)	When does it start growth each year?	When does it flower?*	Best time(s) to control*	Best method(s) of control*	Priority Check** √

* Represents information about a weed that is available in the Weed Species Profiles in Appendix 4 of this handbook or can be obtained from your County Weed Supervisor.
 ** This column should be completed while working on Section 2.2. To determine the priority of a certain weed, use the outline for the Alien Plants Ranking System provided in Appendix 6 of this handbook, or consult your County Weed Supervisor.

(WEED MANAGEMENT PLAN OUTLINE FOR PUBLIC LAND MANAGERS)

(Note: This outline is a modification of a weed management plan template produced by The Nature Conservancy)

WEED MANAGEMENT PLAN

FOR

(NAME of PROPERTY or MANAGED AREA)
(TOWN or COUNTY, STATE)

(TIME PERIOD; e.g. 1996-2000)

PREPARED BY *(Authors, Contributors)*

DATE PREPARED
(Date)

DATE LAST REVISED
(Date)

(In the following outline, text in normal font is meant to be included in each weed plan as boilerplate; text in italics prompts the reader to do certain things, and should be omitted from the completed plan. The person preparing the weed plan should refer to the handbook for guidance and specific information.)

1. INTRODUCTION

A. Context of Weed Management (*suggested language; modify to suit your purposes*)

There has been a tremendous expansion of invasive alien plant species across the US, including Colorado. New problem weed species arrive in Colorado every year. Weeds create large economic losses for agriculture in both cropland and rangeland situations. Noxious weeds often provide poorer habitat for wildlife than native vegetation. Proliferation of alien plant species alters ecosystem processes and threatens certain native species with extirpation. Thus, unchecked weeds threaten our economic livelihood and our biological heritage.

In recognition of the economic and ecological impacts of weeds, the General Assembly of the State of Colorado passed the Colorado Weed Management Act, also known as the Colorado Noxious Weed Act, in 1996. The act requires landowners and managers to manage noxious weeds if they are likely to damage neighboring lands. This act provides that each county in Colorado shall adopt a noxious weed management plan for the unincorporated portions of the county. This plan provides a framework to control those plant species that are listed as “noxious” in (*add county name*) County.

Weeds are rapidly becoming one of the most pressing issues for natural managers. Unfortunately, most natural areas contain many alien plant species. In the vast majority of cases, there is not enough labor and money to control all the species of weeds that occur in a natural area. Thus, managers are forced to choose which weed species they will control and which they will not, at least initially.

B. Overview of Approach to Weed Management (*suggested language; modify to suit your purposes*)

Weed control is part of property management. This plan is based on the desired plant species and communities, rather than on simply eliminating weeds. Preventive programs are implemented to keep the management area free of species that are not yet established there but which are known to be pests elsewhere in the area. Priorities are set to reduce or eradicate weeds that have already established on the property, according to their actual and potential impacts on the land management goals for the property, and according to the ability to control them now versus later. Actions will be taken only when careful consideration indicates leaving the weed unchecked would result in more damage than controlling it with best available methods.

The plan follows the adaptive management approach. First, weed species are identified through inventory of the property and by gathering information from other sources. Second, land management goals and weed management objectives are established and recorded for the property. Third, priorities are assigned to the weed species and weed patches based on the severity of their impacts, while considering the ability to control them. Fourth, methods are considered for controlling them or otherwise diminishing their impacts and, if necessary, re-order priorities based on likely impacts on target and non-target species. Fifth, Integrated Weed Management (IWM) plans are developed based on this information. Sixth, the IWM plans are implemented. Seventh, the results of management actions are monitored and evaluated in light of weed management

objectives for the management area. Finally, this information is used to modify and improve weed management objectives, control priorities, and IWM plans, thereby starting the cycle again. The premise behind a this weed management plan is that a structured, logical approach to weed management, based on the best available information, is cheaper and more effective than an ad-hoc approach where one deals with weed problems as they arise.

2. DESCRIPTION OF THE PROPERTY (or management area)

- A. **Boundaries** *Briefly describe the location of the property. Attach a copy of a map, aerial photograph or GIS image with boundaries drawn and labeled; note boundaries of any management sub-units that are relevant for this plan.*
- B. **Resource Base** *Briefly describe distinctive biological communities, habitat types, land-use histories, valued species, major threats, and other notable characteristics of the site. Describe special features of any management sub-units on the site. You may want to include the locations of important natural resources of the management area on the base map, aerial photograph or GIS image.*

3. INVENTORY OF WEED SPECIES

- A. **Inventory of Weed Species** *Briefly explain how you conducted the inventory, e.g., the areas searched, the ways in which you searched, and the weed species you targeted during the inventory. Attach a list of the weed species found on the property plus problem weeds species in the local area that are likely to invade the property. Note on the list which weed species were actually found on the property.*
- B. **Map of Weed Infestations** *Attach copy or copies of map, aerial photograph or GIS image with locations of weed infestations noted by species. Map these infestations and note the area of each infestation. You can use symbols to denote infestation size or you can estimate the size of each infestation in acres and record this estimate on the map. You can use symbols to denote the size of infestations. For infestations that are larger than five acres in size, draw a line around the boundaries of the infestation; use a square to denote infestations from 1- 5 acres; a triangle for infestations from 0.1 – 1 acre; and x to denote infestations less than 0.1 acre. A solid line can be used to demarcate narrow infestations along linear features such as roads, trails, streams or lake edges. Label each infestation with the weed species it contains. You can use colored pencils to create color-coded maps to facilitate visualizing the number and locations of infestations of various weed species. Use the same color consistently for the same weed species. Estimate the size (in acres) of each weed infestation. It may be most useful to make one map showing the locations of all weed species populations. Alternatively, one map may be too cluttered, and it may make sense to prepare separate maps for each weed species, or groups of similar species. Refer to these maps as you develop specific control strategies for high-priority species in section 6 below (Weed management Actions). This information should be updated annually.*

4. MANAGEMENT GOALS AND WEED MANAGEMENT OBJECTIVES FOR THE PROPERTY

- A. **Land Management Goals**
Goals are statements that generally describe the conditions you are trying to create on the management area, not just things related to weeds. Goals generally deal with human values, natural resources and financial resources. Land management goals may already exist for the management unit. If not, develop management goals, focusing on what you are managing for; clearly state what you want on the site. For example, you may be managing for the following:

1. *Biological communities (e.g., grassland, riparian areas) and the processes (e.g., fire, flooding) that maintain them);*
2. *A species or suite of species that are rare or otherwise valued;*
3. *A corridor or a migratory stopover;*
4. *Forage production for livestock or wildlife;*
5. *Timber production; and*
6. *Public recreation and scenic beauty.*

Describe generally how weeds interfere with your land management goals. See section 3.A. above for a list of weeds that can impact your property. Use this section to justify the use of labor and resources to eliminate or control certain plant species in terms of your management goals, as well as legal requirements. Briefly describe how these species degrade the property, or could do so if allowed to proliferate. Revisit this section and, if necessary, revise it after completing Section 5 below (Priorities for Weed Management). If you determine the impacts of weed species on the property are not as damaging as you had initially thought and need not be controlled, you can use this section to explain that, too.

B. Weed Management Objectives

Objectives are statements that are specific, measurable, achievable, have a deadline and specify a location. They provide a link between very general goal statements and weed management action steps. Establish measurable weed management objectives for the weeds on the property that you decide to control. Objectives should follow from the land management goals above. Each management goal will probably have one or more weed management objectives. One or more weed management objectives will be established for each weed species you decide to control.

5. PRIORITIES FOR WEED MANAGEMENT

A. Prevention (Suggested language; modify to suit your purposes)

The most important weed management action is to prevent weeds from becoming established in the first place. The old adage that “an ounce of prevention is worth a pound of cure” certainly applies to weed management. *Describe the types measures that will be effective in preventing weeds from becoming established on your property.*

B. Weed Species Priorities (Suggested language; modify to suit your purposes)

Weed management priorities based on the actual or potential threat that weeds pose to the management goals for the property. Two factors are used to set priorities, namely the weed species and the locations of weed infestations. Weeds species are important because they vary considerably in the threat they pose to the resource values of the property. In addition, weed species vary greatly in their susceptibility to control measures. Weed species that pose the greatest threat to achieving the management goals for the property and that need to be controlled immediately are the highest priority for management.

To start the weed ranking process, read Chapter V., “Priorities for Weed Management” in the guidebook. Then work through the “Alien Plants Ranking System Version 5.0” in Appendix 6 to rank your weed species. Summarize the weed ranking information in Table 1 of this plan outline (Prioritized List of Weed Species, page 111). Designate the high-priority weed species (H) or assign each weed species a High, Medium or Low priority by writing an H, M, or L after each weed species name. In this paragraph, explain briefly how you determined priorities for the weed species. If you made a graph of degree of threat and difficulty of control, attach a copy.

C. Weed Infestation Priorities

The location of a weed infestation is also very important. The highest priority weed patches are those that are small and isolated from larger infestations of the same high-priority weed species and which occur on or could affect the highest-valued resource on the property. Attach a copy of the map, aerial photograph or GIS image of the property and indicate the locations of the High, Medium and Low priority weed patches and note the weed species in each patch. In this paragraph, explain how you assigned your weed infestation priorities.

6. WEED MANAGEMENT ACTIONS**A. Prevention**

Use the best management practices in Chapter VII as the basis of your weed prevention program. Prepare a list of preventive measures that you will take to employ to stop weeds from becoming established on your property, such as performing periodic inventories of the property to find new weed species, re-seeding bare ground or changing livestock management activities. Note the weed species that are most important to find before they become established. You may wish to specify certain locations where the measures will be most effective.

B. Weed control (suggested language; modify to suit your purposes)

Integrated Weed Management (IWM) is a process by which one selects and applies a combination of management techniques (biological, chemical, mechanical, and cultural) that, together, will control a particular weed species or infestation efficiently and effectively, with minimal adverse impacts to non-target organisms. IWM seeks to combine two or more control actions which will interact to provide better control than any one of the actions might provide. IWM does not necessarily require the eradication of a weed species or a particular infestation of weeds, although these might be objectives in some cases. IWM is species-specific, tailored to exploit the weaknesses of a particular weed species, site specific, and designed to be practical and safe

Briefly (1 paragraph per species) describe or outline the Integrated Weed Management (IWM) actions you intend to take to control the priority weeds and infestations on your property. Note which species you plan to control, where and over what period you plan to do so, the methods you plan to use, which species you plan to monitor and, how you plan to do so. You may also briefly explain why you do not plan to control certain species. Fill in sections A-G of the two-page summary sheet for each weed that you intend to control. (See the "Integrated Pest Management Plans for High-Priority Weed Species" form below. Copy this summary for additional weed species summaries.) Summarize the labor, materials, cost, and schedule information in Tables 2-4. Revise Table 2 (Labor and Cost Projections to Implement Weed Management Plan, page 112) annually after comparing estimated to actual costs (obtained from Table 3). Make copies of Table 3 (Annual Cost and Labor Worksheet, page 113) for each control project or target weed and use them to account for yearly costs and labor. Schedule information is summarized in Table 4 (Weed Management Plan Implementation Schedule, page 115). Revise Table 4 annually.

7. MONITORING (Suggested language; modify to suit your purposes)

Monitoring is the repeated collection and analysis of information to evaluate progress in meeting resource management objectives. Periodic observation of the weeds being managed is necessary to evaluate the effectiveness of a weed control program. If management objectives are not being met, weed control actions need to be modified. Without some type of monitoring, there is no way of knowing whether control actions are contributing to the fulfillment of management objectives.

Briefly (1-3 paragraphs) outline the general approach you will use to evaluate the effectiveness of the weed control actions you are planning, in terms of the weed management objectives you have set for the property. In

section H of the two-page Integrated Pest Management Plan for each weed species you plan to control, you will specify your weed management objective(s) for each weed species and how you plan to determine if the objective have been met so you don't need to repeat them here. Make sure the monitoring you propose will give you the information you need to evaluate success in meeting your weed management objectives with the lowest cost and effort.

8. REFERENCES (if any literature citations are used)

9. APPENDICES

Appendix 1. INTEGRATED WEED MANAGEMENT PLANS FOR HIGH-PRIORITY WEED SPECIES

Appendix 2. EMERGENCY INFORMATION: DIRECTIONS AND MAP TO NEARBY HOSPITALS OR CLINICS

Appendix 3. HERBICIDE USE PROTOCOLS (if herbicide use is planned)

After noting which herbicide(s) will be used and roughly how much will be used, outline any state and local requirements for applicator licensing and/or posting of treated areas. Then, BRIEFLY describe how the herbicide(s) will be stored, mixed and transported. Describe how excess herbicide and any equipment or clothing that has become contaminated will be disposed of. Describe emergency first aid procedures and plans for responding to spills or contamination. List who may apply the herbicide(s), and what protective gear will be available for them.

Appendix 4. HERBICIDE LABELS (if herbicide use is planned)

Attach copies of the herbicide label(s) here.

Appendix 5. HERBICIDE USE RECORD FORMS

Appendix 6. MATERIAL SAFETY DATA SHEETS

Attach MSDS sheets here.

Appendix 7. COPIES OF FORMS FOR COLLECTING MONITORING DATA (optional)

(copy this and next page for additional species)

INTEGRATED WEED MANAGEMENT PLANS FOR HIGH-PRIORITY WEED SPECIES

Scientific name: _____

Common name: _____

Date _____

Updated _____

A. PRIORITY _____

B. DESCRIPTION

In 2-3 line, list habitat, life history, flower color and period, and other useful identifying characteristics.

C. CURRENT DISTRIBUTION ON THE PROPERTY

Refer to section 3.A. and maps, aerial photo or GIS image in section 3.B.; identify high-priority locations for control.

D. DAMAGE & THREATS

Outline damage caused and threats posed by the high-priority weed species. Refer to the weed species profiles in Appendix 4 for this information.

E. WEED MANAGEMENT OBJECTIVE

Establish a weed management objective for this species that supports one or more of the land management goals for the property in sections 4.A and 4.B. above. The objective should be clear and measurable. Include the 1) impact on the area, numbers, density, cover, etc. that you want to achieve; 2) area in which you hope to achieve this; and 3) time period in which you hope to achieve it. For example an objective for Russian olive might be to reduce the density of established Russian olive plants on the management unit to less than 1 plant per acre within 2 years.

F. MANAGEMENT OPTIONS

Viable control options are:

- (1) No treatment;
- (2) *(Treatment alternative 1);*
- (3) *(Treatment alternative 2); etc.*

Briefly discuss the alternatives, indicate the preferred Integrated Weed Management alternative and the conditions (size of area treated, location, timing of treatment during growing season, total anticipated cost, etc.) under which they may be used. Allow flexibility for persons carrying out the plan; conditions in the field may differ from those you anticipated.

Scientific

name: _____

Common

name: _____

Date _____

Updated _____

G. CONTROL ACTIONS PLANNED

Briefly describe the priority weed species and weed infestations to be controlled, materials and methods to be used, and an approximate schedule for control and monitoring activities. If several methods are to be tested, outline the design of the planned experiment or demonstration.

H. MONITORING

Establish one or more monitoring actions for each weed management objective. Keep the monitoring simple - otherwise you probably won't do it. If you use forms to collect monitoring data, include copies in Appendix 5 of this plan.

I. RESOURCE NEEDS

Estimate the amount of time [for staff, interns and volunteers] and money that will be required to carry out the planned control, monitoring and evaluation for this species. This information should be included in Tables 2 and 3.

J. RESULTS OF EVALUATION

This section is to be filled in later, preferably within 1 year, when monitoring data have been collected and evaluated. The evaluation should be used to determine whether any of the sections B-I above should be modified.

