

Mojave Weed Management Area Long Range Plan

I. Introduction

Mission Statement

The Mojave Weed Management Area (MWMA) will cooperate and coordinate activities necessary for the prevention and control of weeds* in the Mojave Desert. The emphasis of these activities shall be focused on the prevention of weeds, and their expansion, through education and control.

The Problem

Weed infestations in the Mojave Desert in California reduce the biological, agricultural, recreational, and economic value of the land and negatively impact the environment by suppressing native plant species. A coordinated approach among federal, state, and local agencies will improve the effectiveness of weed management efforts in the Mojave Desert. Weed management efforts may include site identification, public education, and mechanical, biological, chemical, and cultural control.

The Solution

Goals of this Long Range Plan for the coordinated management of weeds are:

- 1) Protect and enhance biodiversity and promote fully functioning ecosystems
- 2) Protect and enhance water resources
- 3) Reduce fire hazard and fire control costs
- 4) Increase profitability and value of cropland and rangeland
- 5) Decrease costs of roadside, park, and waterway maintenance

To accomplish these goals, it will be necessary to:

- 1) Bring about greater coordination, cooperation, and action to successfully halt the spread of weeds and help restore weed-infested lands to a healthy and productive condition.
- 2) Heighten all citizens' awareness of the degradation brought to Mojave Desert lands by the spread of weeds.
- 3) Provide a Coordinator to manage the MWMA program.

The Long Range Plan will address four major elements critical to building a strong and successful regional weed management program.

- 1) Education, Awareness, and Outreach
- 2) Prevention: Exclusion, Detection, and Eradication
- 3) Survey, Inventory, and Mapping
- 4) Control and Project Monitoring

* For the purpose of this document, a weed is a plant species that is detrimental or destructive to agriculture, silviculture, or natural ecosystems, and difficult to control or eradicate.

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The Long Range Plan outlines actions designed to stop the spread of weeds with an emphasis on the application of Integrated Weed Management practices. To accomplish this, the supporters and cooperators will seek to meld resources, priorities, and strategies into a unified action. The Long Range Plan is a five-year plan and will be reviewed annually to reflect program successes and new challenges. Unified action is the best method for reducing the extensive ecological, economic, and social impacts of weeds on the Mojave Desert's resources and people.

The Mojave Weed Management Area

The geographic scope of the MWMA includes the portion of San Bernardino County in the Mojave Desert Resource Conservation District, the portion of Inyo County east of Death Valley National Park, all of Death Valley National Park, and all of Joshua Tree National Park.

Participation in the MWMA is open to any public or private individual, organization, or agency interested in weed management, subject to signing the MWMA Memorandum of Understanding (Appendix A).

II. Program Description

General Overview

The MWMA program is directed at suppressing and eradicating weeds in the Mojave Desert. The program is generally a cooperative effort of all the participants. Program funding and administration is coordinated by the Mojave Desert Resource Conservation District's MWMA Program Coordinator. Educating the public to assist in controlling weeds is an important component. The different organizations and individuals supply money, personnel, and equipment, and cooperate in procuring grants and aid. Whether a certain weed is eradicated, suppressed or otherwise managed is usually determined by: 1) State rating (mandate), 2) pest potential in the Mojave Desert and adjacent regions, 3) size of infestation, 4) whether control methods are available, and/or 5) whether there is interest from organizations or government agencies.

Prioritization

To facilitate planning and implementation of educational and control programs, representatives from the partner agencies developed a list of target species within the MWMA. However, weed control activities are not limited to only species on the target list. The list will be used to help prioritize weed projects, and will be modified as needed.

Priority Species (*In alphabetical order*)

Camel thorn	<i>Alhagi camelorum</i>
Dalmation toadflax	<i>Linaria dalmatica</i>
Fountain grass	<i>Pennisetum setaceum</i>
Giant reed	<i>Arundo donax</i>
Halogeton	<i>Halogeton glomeratus</i>
Puncture vine	<i>Tribulus terrestris</i>
Red Brome	<i>Bromus madritensis</i>
Russian thistle	<i>Salsola tragus</i>

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Sahara mustard	<i>Brassica tournefortii</i>
Saltcedar	<i>Tamarix ramosissima</i>
Tree of Heaven	<i>Ailanthus altissima</i>
White horenettle	<i>Solanum elaeagnifolium</i>
Yellow starthistle	<i>Centaurea solstitialis</i>

III. Program Elements

Education, Awareness, and Outreach

In general, citizens and landowners in our community have little understanding of how weeds negatively impact the environment, economy, and natural resources so important to them. Weed management still tends to be viewed as an issue exclusive to more traditional row crop agriculture and front lawns, rather than an integral part of natural resource management activities, such as: outdoor recreation, fire, wildlife, wilderness, grazing, timber, maintenance of transportation corridors, and urban area management. Greater awareness and understanding from California citizens and landowners will lead to increased actions from local, state, and national officials in making weed species a priority.

Education is one of our best tools in preventing the further spread of weeds, locating previously unknown and remote weed populations, and in rallying support in controlling and eradicating infested sites. Raising public awareness and understanding requires a well-planned, well-funded, and long-term program.

Action: MWMA Education, Awareness, and Outreach efforts will include:

- MWMA Weed Brochure – Produce and distribute an informational brochure identifying the MWMA’s 13 priority species. (*SB1740 funding*)
- Weed Tours – The MDRCD Annual Tour will include at least one MWMA site visit and/or presentation.
- Public Outreach – Participate in appropriate workshops and events to promote greater awareness and understanding of the negative impact of weeds.
- Technical Support – Provide weed management technical support to existing school environmental programs.
- MWMA website – Develop and maintain the MWMA website.

Prevention: Exclusion, Detection, and Eradication

Preventing a pest from becoming established in an area avoids all associated losses and costs for control of that pest into the indefinite future. Prevention covers all aspects of keeping a weed from becoming established in a new territory. The components of prevention commonly include exclusion, detection, and eradication. In addition, public outreach affects all components of prevention.

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Exclusion includes all activities to keep a weed from crossing the border of a region. At the national or state level, it often depends on border inspections. At the county level, it often depends heavily on appeals to the public to use caution in activities that can intentionally or unintentionally move species. To a lesser extent, it may depend on regulatory activities such as nursery inspections, weed-free forage programs, and other weed abatement activities.

Detection and eradication of early infestations deal with weeds that have by-passed the exclusion system. Detection includes all activities to find new infestations of weeds that normally do not exist in a region. Eradication includes all activities to completely remove an infestation. A perfect exclusion system would find and eliminate every individual pest before it could enter a new region. Currently, such a system can only be applied to the weeds that pose the greatest economic and environmental threat due to the numerous resources required to conduct an eradication program. Weed populations increase rapidly with time when they are in a new, hospitable environment, and costs of control increase directly with the size of the population. Prevention systems accept that it is only a matter of time before many new weeds will appear in a new region. However, when new infestations are found early through a good detection system, costs of eradication are lower and chances of successful eradication are higher.

Action: MWMA Prevention actions include:

- Weed-Free Forage & Weed-Free Mulch Programs – Support federal and state programs that prevent the spread of weeds through forage and mulch.
- Nursery Education Initiative – Provide a list of plants on CDFA and CalEPPC lists to nurseries and landscaping companies.
- County & State Detection Programs – Promote increased county and state surveillance efforts.
- Weed Identification Booklet – Seek grant funding to produce a pocket weed guide.

Survey, Inventory, and Mapping

The MWMA believes that a strategic and long-term approach to weed control is based on a solid knowledge of the regional distribution of the weeds. The choice of control objective (i.e., eradication, suppression, or containment) and control technique will depend on how the weed is spread over the landscape.

The weed mapping strategy itself should be tied to the average infestation level of the region and the management goals for the populations in the region. Where weeds are very heavy it is not necessary or feasible to do fine-grained, intensive mapping. Mapping these weeds at the section or even township level can provide most of the information that is necessary for regional prioritizing. Where the weeds are in small, localized populations, more accurate locality information is needed for eradication efforts. Mapping weeds intensively and accurately at the edge of a containment zone is also critical to succeeding at stopping spread.

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Mapping does not need to be done by trained professionals with expensive GPS units. With proper identification training most individuals, including volunteers, can map weeds either with inexpensive GPS or paper maps. The California Department of Food and Agriculture is coordinating a statewide network of WMA GIS and the MWMA is participating in this project. The MDRCD has provided a computer and GIS software. Data collected in the MWMA is input by the MWMA Coordinator.

Action: MWMA Survey, Inventory, and Mapping actions include:

- Existing Data – Compile existing weed mapping data into the MWMA GIS.
- Mojave River – Seek funding to begin survey of Saltcedar and *Arundo*.
- Control Project Mapping – Obtain mapping data in conjunction with weed control projects.

Control, and Project Monitoring

Weeds pose a threat to crops, rangelands, irrigation systems, roadsides, wildlands, recreation areas, and homes. Weed control is best achieved using a long-term, integrated approach. Weed management is an effort to eradicate, suppress, or contain a weed infestation from a particular area. Integrated Weed Management (IWM) is a systems approach to weed control. IWM involves developing a planned, strategic program that will take several factors into consideration to maximize weed control. These considerations include the control objectives for the land (eradication, suppression, or containment), the effectiveness of the control technique on the target species, biological and environmental factors, land use, economics, policy and legal restrictions, practicality, and the extent and nature of the weed. When implementing weed control techniques, this approach considers using all available control methods known for a weed species. These methods include: chemical methods, physical or mechanical methods, cultural methods, and general land management practices. Biological control may also be used for containment and control objectives, but not for eradication.

One important consideration that must be part of any weed control project is the control objective. These objectives can be described by the following terms: eradication, suppression, and containment. Considerable overlap may occur among all three objectives within any one management/weed control plan.

- 1) Eradication is a type of control objective aimed at eliminating all individuals of a particular species within a specified area (defined in Prevention section above). This objective is the goal when the weed is of considerable economic and environmental concern and the weed's population size is small.
- 2) Suppression is a weed management objective aimed at reducing the current infestation density, but not necessarily reducing the total area or boundary of the infestation. This applies to many widely distributed, high-density weeds where eradication is not feasible.
- 3) Containment is a weed management objective aimed at preventing infestation expansion and spread, and may be conducted with or without any attempt to reduce infestation density. This objective is an alternative to eradication or suppression.

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Containment focuses on halting spread until suppression or eradication can be implemented.

In order to ensure the success of a weed control project, specific project goals must be made. These project goals should be made for both the short and long-term, as persistent weeds take several years to achieve the desired level of control. For example, project goals may be made for 1-year, 5-year, and 10-year increments. Management plans should be revised annually and modifications made as needed. Mapping infestation sites should be performed to develop priority weed control projects, measure baseline vegetation data, biological control agent population information, and project success.

Monitoring and evaluation of projects indicate the degree of success and impacts to target and non-target vegetation resulting from weed management activities. Other than personal observation and professional judgment, there is seldom any baseline information available on which to make evaluations. Since success will depend on achieving the objectives in strategic plans and integrated weed management plans, it is imperative that monitoring data be collected to assess changes and trends. The MWMA will establish inventories or collect baseline data prior to treatment (pool of existing knowledge and data from cooperators); develop specific evaluation methods prior to project onset; collect reduction in cover data to evaluate control success; evaluate the effectiveness of treatment and management measures at six months, one year, and two years after treatment; take photos of each project site on three occasions: just before treatment, six months after treatment, and one year after treatment at the time of cover sampling; and compile and present data annually to the MWMA.

Actions: MWMA Control and Monitoring actions include:

Saltcedar Control Project at the Lewis Center (Mojave Narrows)
(SBI740 and Mojave Water Agency funding)

- Saltcedar will be treated using a cut-stump/herbicide application (Roundup Pro Concentrate).
- The MDRCD will provide a Leader and Assistant; volunteers from Apple Valley High School will assist with control efforts.
- Monitoring will be conducted by the Lewis Center for Educational Research.
- The MWMA will seek funding for additional control/restoration efforts at this site.

Sahara mustard Control Project at Johnson Valley OHV Area (USGS, BLM, & MDRCD)
(SBI740 funding)

- This is a pilot control project using mechanical and chemical methods to eradicate a known population of Sahara mustard.
- Control methods for Sahara mustard are mostly unknown; results from this project will assist in determining effective methods for eradicating new populations.
- Success will be evaluated by monitoring the soil seedbank before and after treatments.
- The MWMA will seek funding for additional identification and eradication efforts.

Fire Behavior, Fire Effects, and Fuel Management in Blackbrush (*Coleogyne ramosissima*) Shrublands and Invasive Annual Grasslands of the Mojave Desert
(USGS, NPS, and Joint Fire Science Program funding)

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- This project is evaluating the effects of invasive annual plants on fire behavior and fire effects, and the role of fire in promoting plant invasions at Joshua Tree National Park and other sites in the Mojave and Great Basin deserts.
- Interactions between invasive grasses, fire, and atmospheric nitrogen deposition are also being evaluated.
- Herbicide and early season fire are being evaluated as control methods for the invasive grasses *Bromus rubens* and *Bromus tectorum*.
- Effects of treatments on native plants are also being evaluated.
- Success will be measured by monitoring the soil seedbank and plant cover before and after treatments.

Effects of Off-Highway Vehicles on Soils and Biodiversity in the Mojave Desert (USGS and BLM funding)

- This project is evaluating the cumulative effects of 30 years of OHV use on soils and biodiversity at the Dove Springs Open Area.
- Sampling is stratified by high, medium, and low densities of OHV tracks digitized from aerial photos taken periodically between the 1960s and 2000s.
- One of the response primary variables being monitored is dominance by invasive annual plants.

Funding and Finance

Funding for all phases of weed management is chronically inadequate. The current rate of spread of major weeds, and the introduction of new species, is far out-stripping our ability to contain them. The problem is most acute in counties with sparse populations and small private land bases, resulting in a low tax base. Furthermore, federal funding is still far from sufficient to deal with the extent and scope of the problem on the nearly ____ million acres of federal land in the MWMA. Beyond state appropriated funds, a large pool of available grant money exists. Grant funds are not typically targeted specifically for weed projects, but can be tapped in to by encompassing weed control into larger watershed and restoration level projects.

Another source of funding comes from MWMA cooperating members. Many partners have in-kind support in the form of control equipment, educational materials, computer and printing capabilities, and a variety of unique expertises. While large-scale projects require considerable funding, the MWMA can achieve many educational, inventory and mapping, and limited control objectives by drawing on resources within the MWMA group.

Action: MWMA Funding and Finance actions include:

- Grants – Beyond SB1740 funds, the MWMA will submit proposals for at least two grants each year. Each grant will target one project designated by the MWMA partners.
- Assessment of In-Kind Resources – To continually recognize resources available within the MWMA, a survey of MWMA members will be conducted, as new projects arise, as to what in-kind contributions could be made to complete the project.

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- MWMA Program Coordinator – The MWMA Program Coordinator is responsible for arranging/recording meetings, maintaining records, preparing/managing grant proposals, maintaining the MWMA website and GIS, and performing other administrative/project tasks. The MDRCD has provided part-time funding for this position; however, the MDRCD does not have the financial resources to support this position indefinitely. The MWMA partners need to establish permanent funding (through grants, donations, etc.) for the Coordinator position.

IV. Appendices

Appendix A – Mojave Weed Management Area Memorandum of Understanding