

City of Roseville Open Space Preserve Interim Invasive Plant Management Plan

Final

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Prepared For:



Prepared By:

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**City of Roseville Open Space Preserve
Interim Invasive Plant Management Plan**

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INTRODUCTION

Within the City of Roseville (City), there is an approximately 1,992-acre, City-owned Open Space Preserve system (Figure 1. *City of Roseville Open Space System*) and an approximately 532-acre primarily City-owned General Open Space system, resulting in a total of approximately 2,524 acres of Open Space covered by the City of Roseville Open Space Preserve Overarching Management Plan (OSPOMP, ECORP 20011).

The Open Space Preserve system consists of land that was required to be set aside as part of a regulatory permitting action and is typically protected by either a Conservation Easement or Declaration of Covenants and Restrictions (Deed Restrictions). The Open Space Preserve areas are primarily vernal pool grassland or riparian corridors protected due to the presence of waters of the U.S. and/or U.S. Fish and Wildlife Service (Service) regulated endangered/threatened species (Endangered Species) habitat (Figure 2. *Habitat Management Units*). Mitigation for impacts associated with the individual development projects was often constructed within the associated Open Space Preserve.

The remainder of the Open Space in the City covered by the OSPOMP is General Open Space (see Figure 1). General Open Space areas owned by the City were set aside due to City policy or to meet Specific Plan or General Plan requirements and are not subject to any permit related restrictions.

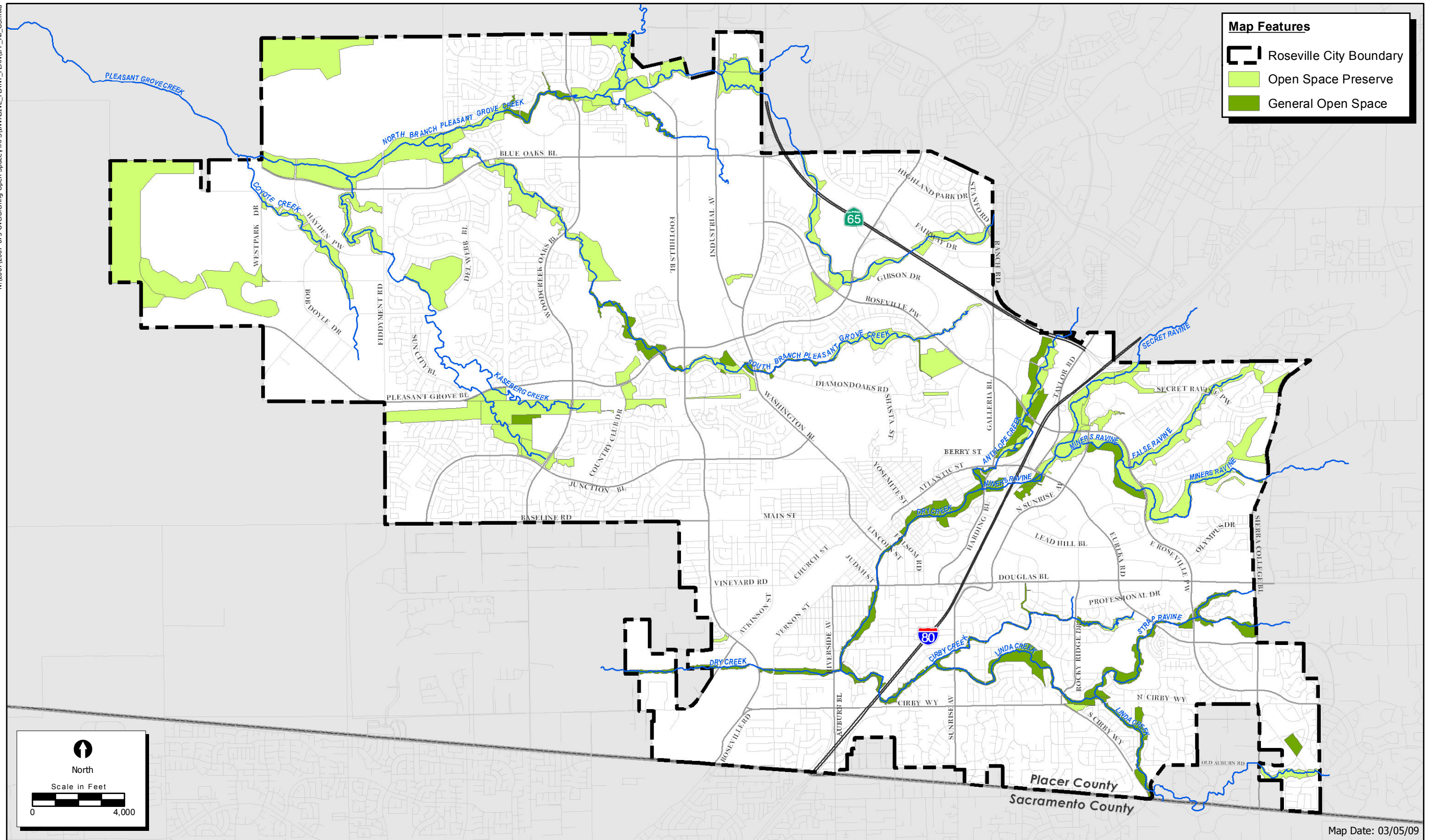
This Interim Invasive Species Management Plan has been developed until funding can be identified for the final Invasive Species Management Plan. The final plan will be based on The Nature Conservancy's template management plan (Attachment A).

NATIVE, NON-NATIVE, AND INVASIVE PLANT SPECIES DEFINITIONS

Native and non-native plant species are mentioned in several sections of this Interim Plan. The following definitions of these terms have been included to assist the Open Space Manager in determining the status of plant species found in the City's Open Space.

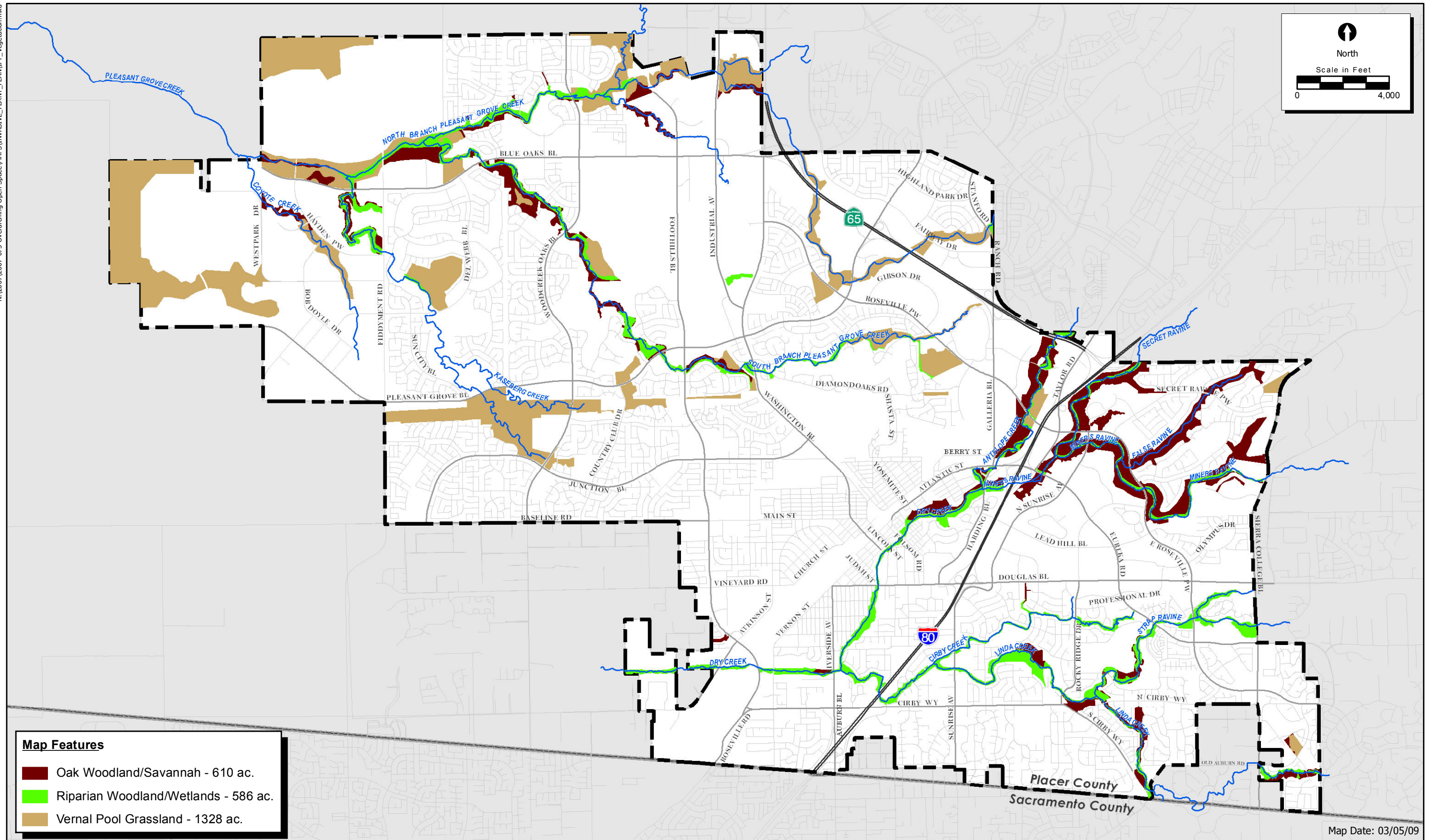
Native Plants

For the purposes of this Interim Plan, plants native to the City's Open Space will be defined as those plants believed by the scientific community to have been present in western Placer County prior to the settlement of Europeans. The Jepson Manual can be a reference for determining if a plant is native or non-native. However, this reference only gets as specific as subregions. As a result, this reference is not necessarily specific enough, and therefore the Open Space Manager can consult with the Monitoring Biologist, local botanists, or the local chapter of the California Native Plant Society to determine if a plant should be considered native to the City's Open Space.



2007-075 City of Roseville Open Space Preserve Overarching Management Plan

Figure 1. City of Roseville Open Space System



2007-075 City of Roseville Open Space Preserve Overarching Management Plan

Figure 2. Habitat Management Units

Native Invasive Plants

Some native plants can be considered invasive in specific circumstances and may be managed by the City. These species typically form monocultures that crowd out other native species (e.g., cattails).

Non-Native Plants

Based on the above definition of plants considered to be native to the City's Open Space, there are several ways to view what a non-native plant is: there are plants that are not locally native (native to Placer County), plants that are not regionally native (native to Northern California), and plants that are not native to California or the U.S.

Non-Native Invasive Plants

Terminology regarding non-native invasive plants varies. Some use weed, non-native invasive plant, exotic pest plant, etc. This Interim Plan defines non-native invasive plants as plants that replace native vegetation or native habitats. The Monitoring Biologist and the Open Space Manager can refer to the species found on the Cal-IPC 2006 California Invasive Plant Inventory (Inventory) to assist them in determining if a plant is an invasive plant species of concern. A portion of the Inventory (Table 1) has been included as Attachment B, however this list may be updated from time to time by Cal-IPC. The new list will be appended to this Interim Plan as it is updated. The list can be found at <http://www.Cal-IPC.org/>.

INVASIVE PLANT MANAGEMENT

Under current baseline conditions, the City is known to support a number of invasive plants, many of which have become naturalized. It is a goal of the OSPOMP to create a City-wide map of invasive plant populations. When finalized, the map can be added to this Interim Plan. The map should be updated annually if new populations are identified.

The required management of non-native plants under the OSPOMP will be limited to the management of newly introduced invasive plants and working to contain the spread of invasive plant populations that are of the most significant threat to the biological resources within the City's Open Space. This management will be limited by available funding.

Beyond the required management activities, the Open Space Manager will pursue more extensive removal of invasive or non-native plants through volunteer efforts or grant funding as time allows.

Integrated Pest Management Methodology Within City Open Space

Integrated Pest Management (IPM) is a methodology that was developed to guide management of plant pests. This methodology can also be used to develop a framework for management of invasive plant species. The IPM involves a four-step approach, as follows:

1. Set Action Thresholds

Before taking action, thresholds must be identified. These thresholds define the point at which action is necessary, based on the invasiveness of a species, environmental conditions, and the potential for spread. The presence of a single invasive plant may not be sufficient to trigger action. Prioritization of actions has been addressed in OSPOMP Table 7-5, and action thresholds will be refined in detail in the final Invasive Plant Management Plan to be developed by the City.

2. Monitor and Identify Invasive Species

Monitoring is necessary to determine if existing non-native plant populations are spreading, and to identify new populations. Some non-native species may not require control, depending on the environmental conditions. Monitoring will help to ensure that appropriate control decisions can be made in conjunction with action thresholds. It is a goal of the OSPOMP to create a City-wide map of existing invasive plant populations. The map should be updated annually if new populations are identified.

3. Prevention

Preventative measures will be implemented to minimize the chances of new non-native plant populations becoming established in the Open Space. Such measures are detailed throughout the OSPOMP, and include:

- Planting only native species in and adjacent to Open Space,
- Using native seed for erosion control,
- Ensuring that equipment used within the Open Space is free of plant material

4. Control

Once monitoring, identification, and action thresholds indicate that invasive species control is required, and preventive methods are no longer effective or available, IPM programs then evaluate the proper control method both for effectiveness and risk. Effective, less risky controls, such as weeding or grazing, are chosen first. If monitoring, identification, and action thresholds indicate that less risky controls are not working, and then additional control methods would be employed, such as use of biological controls. If other control methods are unsuccessful, herbicides will be considered as a last resort.

Control Methods will be considered and used in the following order:

1. Hand pulling, or use of a weed wrench or chainsaw
2. Mechanical removal involving larger equipment, such as mowers
3. Grazing and/or controlled burning
4. Biological control (natural parasites, predators or pathogens)
5. Solarizing (unproven - may used on a trail basis to assist with research)
6. Use of herbicides

In situations where herbicide is the preferred control method, the herbicides and application methods for the different target species are identified in Attachment C.

Hand/Mechanical Removal

Hand removal or use of small hand powered or handheld equipment (such as a Weed Wrench or a chainsaw) should always be the preferred method of removing invasive plant species from the City's Open Space, if practical. If hand removal methods are tried and found to be ineffective, or the problem is too widespread for hand removal to be practical, then mechanical methods (use of larger equipment with motors such as mowers) or biological controls as described below can be implemented.

Biological Controls

Biological controls are natural parasites, predators or pathogens that are released to combat non-native species. For example, there are several natural enemies of yellow star thistle that have been introduced from Europe to act as biological controls against this invasive species. The insects begin life within the seed head of the flower and develop there, feeding on the seeds. County Agricultural Commissioner would be the point of contact for use of these biological controls within the City's Open Space. They currently do not have a program for providing the hairy weevil for biological control, however, they must be contacted if biological controls obtained from other sources are proposed for use.

Biological controls should be used with caution and only after contact with the Agricultural Commissioners Office. If biological control methods are tried and found to be ineffective or if biological control methods are not available for the target species, then herbicides can be used, but only as outlined below.

Use of Herbicides for Non-Native/Exotic Pest Plant Management

If hand or mechanical removal is found to be ineffective, herbicides can be used for the management of invasive plant species. Herbicides can be potentially harmful, however invasive species can also be extremely detrimental to native habitats. The use of chemicals should be considered carefully and the most recent research regarding the appropriate herbicide for the target plant should be consulted. This approval does not obviate the need for the City to obtain any other applicable approvals for the use of these chemicals.

The following conservation measures should be implemented as part of this plan.

Mixing Site BMP's

1. As a precaution against spillage, sprayer tanks will never be left unattended during filling. Mixing, loading, and rinsing will not take place within preserves, riparian or open space areas.
2. All chemical containers will be triple rinsed.
3. All pesticide sprayers will be properly cleaned.
4. Empty, triple rinsed pesticide containers will be recycled at local herbicide container collections. These containers will not be stockpiled from year to year.
5. All unused herbicides that are no longer needed will be properly disposed of at local "safe send" collections.

6. Herbicides will be stored in a secure, properly ventilated location where product usefulness can be maintained, and any spillage will be easily contained.
7. All herbicide spills will be attended to immediately.

Improved Pesticide Application BMP's

1. The City will utilize herbicides with low mobility and persistence wherever the use of these alternatives will meet treatment objectives.
2. Herbicide formulations that reduce drift will be utilized wherever possible.
3. Spray equipment will be adjusted to produce the optimum droplet size for coverage of the target organism while reducing drift.
4. Herbicide spray applications will be made at the optimal height to cover target plants, and reduce drift potential.
5. Herbicide applications will never be made when weather conditions may facilitate drift or runoff (high winds, precipitation, or inversions)
6. Equipment will be calibrated regularly to ensure that the proper amounts of herbicides are applied.
7. Adjuvant (MSO) will be used when recommended to allow for better contact with target organisms, and lower rates of herbicides to be applied.

Best Management Practices and Personal Protective Equipment

All chemical applications will be planned and conducted with the coordination and under the supervision of a licensed applicator certified in the appropriate State category that covers the application. Boom spraying will only be conducted when wind speeds average 7 miles per hour (mph) or less, and preferably in the 3 to 5 mph range, with no gusts greater than 10 mph. Anti-drift nozzles will be utilized. Inversion conditions, typical in calm and very low wind conditions, will be avoided since these conditions facilitate large-scale herbicide drift off site. Only enclosed cab equipment with air conditioning will be used to boom spray, offering the maximum protection from contamination to the operator/applicator. Due to frequent windy conditions during afternoon periods and early spring in general, boom spraying will typically be conducted in the early morning in late spring or summer, based on observations and the weather forecast. Spray applications will not be conducted on days when there is a 30% or higher forecast for rain within 6 hours, except for products that are rapidly rainfast (e.g., glyphosate in 1 hour).

Applications of herbicides prone to leaching will also not be made within 24-48 hours of likely (greater than 50% chance of) moderate to heavy rainfall. Certain herbicides are less likely to leach and more effective following a light rainfall that moistens the soil, and these conditions are usually indicated as optimal on the label. Complex herbicide applications will take these factors into consideration, and when feasible, will take advantage of these factors.

A hand held wind meter will be used to determine wind speed at the application site, and wind direction will also be evaluated relative to any sensitive sites. If the wind temporarily increases during boom spraying, lowering the nozzle pressure, thereby reducing droplet size, can reduce drift. However, this practice will reduce the application rate for the area affected, and would have to be combined with shifting to a lower gear (reduced speed) to approximate the same standardized application rate. When boom spraying, it is desirable to maintain the same

combination of gear and rpm's used in calibrating the boom sprayer, so any exceptions to this standard practice will be minimized. Also, maintenance personnel will routinely limit herbicide drift by using anti-drift nozzles. A nontoxic anti-drift agent will also be used when allowed by the label, especially adjacent to sensitive resources. Equipment will be calibrated as necessary to ensure that herbicide application rates are accurate.

Personal Protective Equipment: Applicators will wear personal protective equipment (PPE) in accordance with the specific labeling requirements for each product, and the City as needed, will supply all PPE. The required PPE, as specified by the label, will be worn at all times during handling, mixing and application. Fresh clean clothing, such as coveralls, laundered after each use, will be put on daily before handling pesticides used in application and removed before engaging in other duties unrelated to the application. Mixers and applicators will wear a pair of footwear specially designated for herbicide use, and will not wear the designated footwear for other operations to minimize contamination.

As exposure to concentrated product is usually greatest at mixing, extra care will be taken during the mixing period. Persons involved in mixing will be best protected if they wear extra long gloves, an apron, and designated footwear and face shield throughout the mixing process, in addition to the protective clothing required by the label. Coveralls and other clothing used in an application will be laundered separately from other laundry items, or disposable Tyvek clothing may be used. Transportation, storage, handling, mixing and disposal of pesticide containers will be consistent with label requirements, EPA and OSHA requirements.

Surfactants and anti-drift agents: Surfactants provide benefits by increasing plant uptake of the applied herbicide and will normally be used if specified on the label. To the maximum extent possible, consistent with label specifications, the City will select surfactants and anti-drift agents that are themselves low in toxicity by comparing information available from the product MSDS's and by consulting contaminant specialists when additional information is needed.

Dyes: A non-toxic dye may be used to assist applicators in visually determining target acquisition, potential drift or over-spray, the amount of treatment applied, and to aid in discovering equipment leaks. If a leak is discovered, the application will be stopped until repairs can be made. Any dyes or foam markers used must also be non-toxic.

Spills: If a spill occurs, the top priority will be the decontamination of any personnel involved. Any gloves, clothing or other PPE involved in the contamination will be removed as soon as practical and cleaned or discarded appropriately, and the applicator will be provided with the time and opportunity to wash up and decontaminate as thoroughly as needed. A continuous emergency eye wash station will be available near the mixing station. Whenever possible, mixing stations will be located near a shower stall or other means of thoroughly washing off and decontaminating the entire body. A "spill kit" with absorbent material will be kept on hand wherever pesticides are stored, mixed, or when transported, and the storage and mixing areas will provide containment appropriate for the volume of material involved. A tarp will be used to cover any spill site until retrieval of the spilled material, cleanup or capping of the site occurs. If the spill cannot be cleaned up and contained immediately, City Fire Department spill response personnel will be contacted.

Labels and Material Safety Data Sheets: Prior to each treatment season and prior to mixing or applying any product for the first time each season, all applicators will review the label, MSDS, and Pesticide Use Proposal (PUP) for each product, determining the target pest, appropriate mix rate(s), PPE, and other variables listed on the label. A written reference for each tank to be mixed (on a note pad, chalk board, dry erase board, etc.) will be provided in the mixing area to use as a quick reference while mixing is in progress.

Notification: Staff, volunteers, and members of the public who could be in or near the treatment area within the stated reentry time period on the label will be alerted concerning treatment areas, and posting will occur in any site where the individuals might inadvertently become exposed to a pesticide during other activities. Where required by the label, sites will also be posted on all corners and at other locations of likely site entry, such as trailheads.

Pesticide Disposal: Empty product containers will be triple rinsed. Empty containers will be triple rinsed and recycled at local collection sites. Solutions used to clean equipment after application such as water, will be recaptured and reused or applied to an appropriate pest plant infestation.

Training and Supervision of Pesticide Applicators: At least one staff member will be a trained Certified Applicator, and any staff member applying an herbicide must be operating under his/her **direct** supervision. Preferably, all staff involved in herbicide applications will be afforded the opportunity to attend appropriate training. New staff unfamiliar with the City procedures for storage, mixing, handling, applying and disposing of herbicides and containers, will receive orientation and training **before** handling or using any products, and documentation of that training, and related training, will be placed in files for documentation.

Log of Pesticide Use: A log will be maintained to record and document each application, applicator, amount of product(s) used, location, time of day, acreage and, for boom spaying treatments, wind speed. These records will assist in producing the annual Pesticide Use Report and will meet other documentation requirements.

LIST OF ATTACHMENTS

Attachment A – The Nature Conservancy's Template Management Plan

Attachment B – Cal-IPC 2006 California Invasive Plant Inventory Table 1

Attachment C – Herbicide Use within City Open Space

ATTACHMENT A

The Nature Conservancy's Template Management Plan

Using the TNC Site Weed Management Plan Template

Updated July 2001 by Mandy Tu & Barry Meyers-Rice /WISP

A Note to Land Managers (Project Directors, Project Ecologist):

We encourage each preserve to develop a comprehensive weed management plan. The attached Site Weed Management Plan Template is designed to make this easier. This template is also designed to help you develop an adaptive management strategy for invasive species management (see Figure 1). Adaptive management of invasive species requires that you:

- (1) establish management goals and conservation targets for the site;
- (2) determine which, if any, species or infestations threaten or have the potential to threaten your management goals and targets - those that do are "weeds";
- (3) determine which methods are available to control the weeds;
- (4) develop and implement a weed management plan designed to move conditions towards the management goals and to abate threats to your targets;
- (5) monitor and assess the impacts of the weed management actions in terms of the management goals and target protection;
- (6) start the cycle over again by re-evaluating conclusions made in steps 1-4 and modifying where necessary.

Note that you do not plan or implement weed control until steps 1-3 are completed. Step 5 is necessary to periodically re-evaluate the goals, objectives and plans made earlier so that they can be altered or modified, as called for. This is the essential "adaptive" process required by this strategy.

The template provides a standardized format with headings and boilerplate language in normal or **bold** font. Instructions and advice are in *italics* and can be cut as you fill in the necessary information. Advice on setting priorities for weed control is presented in Section 2A.

The computer version of the template consists of three files (all available on the internet at <http://tncweeds.ucdavis.edu>):

- 1) WMPIntro.rtf – Weed Management Plan Introduction and instructions (this file)
- 2) WeedTemp.rtf – Weed Management Plan template file
- 3) WeedTabl.xls – Tables

Also, an example of a completed weed plan from the Cosumnes River Preserve, California, is available as:

- 4) CRP-Plan.doc – The Cosumnes Preserve is a landscape scale project (ca 40,000 acres) and has a variety of weed problems ranging from easily treated small colonies of plants to heavily entrenched, widespread infestations of hard to control species. As a result, the Cosumnes River Preserve Weed Plan is long and relatively complicated. You should not feel compelled to develop such a large document. Rather, create the document that fits your situation and will be implemented. Do not hesitate to borrow or use text from this template, and feel free to consult with us if you have any questions about weed control methods and strategies.

- 5) CRP-Tabl.xls – The WeedTabl.xls spreadsheet, completed for the CRP-Plan.doc weed management plan.

Contact us if you have any questions or comments regarding the template. Please send us copies of your completed weed management plans.

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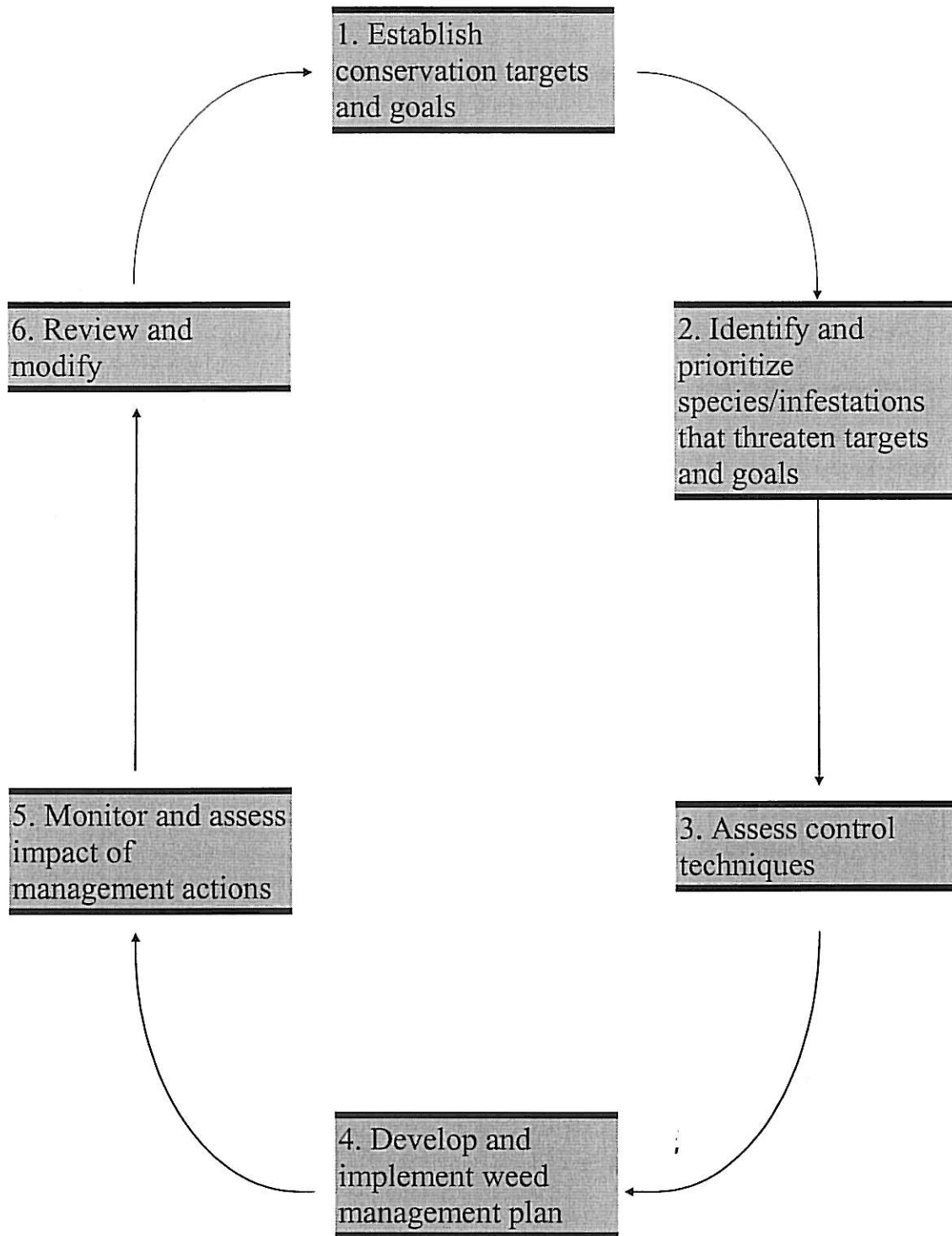


Figure 1. Flow chart for Adaptive Management of Weeds describing management actions and decisions confronting natural area managers (from Randall (1997), based on a diagram by Oren Pollak, personal communication).

Site Weed Management Plan Template
TNC's Wildland Invasive Species Program
Revised: Mandy Tu & Barry Meyers-Rice/WISP

SITE WEED MANAGEMENT PLAN

FOR

(NAME of PRESERVE or CONSERVATION AREA)
(TOWN, STATE)

(PERIOD; e.g. 2001-2005)

PREPARED BY *(Authors, Contributors)(Program)*
THE NATURE CONSERVANCY

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1. INTRODUCTION

A. Description and purpose of the site (preserve or managed area)

*Briefly describe distinctive biological communities, habitat types, land-use histories, valued species, conservation targets and goals, and any major threats to achieving those targets and goals. Describe special features of any management sub-units on the site. When describing the management goals, focus on what you are managing **for**; clearly state what you **want** on the site. For example, you may be managing for the following:*

- 1. a biological community and the processes (e.g., fire, flooding) that maintain it;*
- 2. a species or suite of species that are rare or otherwise valued;*
- 3. a corridor or a migratory stopover.*

B. Description of how certain plant species ("weeds") interfere with management goals

Use this section to justify the use of labor and resources to eliminate or control certain plant species in terms of your conservation targets and goals. Briefly describe how these species degrade the site, or could do so if allowed to proliferate. See Section 2.B.II. for a list of impacts weeds can have on natural areas. Revisit this section and, if necessary, revise it after completing Section 3 (Specific Control Plans for High Priority Species).

If you determine the impacts of certain species are not as damaging as had been thought and need not be controlled, you can use this section to explain that too.

Most species considered "weeds" in natural areas are invasive, i.e. able to move into and dominate or disrupt natural communities or restoration projects. Both non-native and native species may be "weeds". We define "non-native species" as those species that arrived in and colonized an area only with direct or indirect human assistance, even if they are native elsewhere on the continent or in the state. They may also be called "non-indigenous", "alien", "exotic", "adventive" or "naturalized" species. Situations where "native" species may be regarded as "weeds" include: a) when Phragmites has invaded a site that previously provided important open-water habitat for waterfowl; and b) when native woody species have invaded a prairie site.

C. Inventory of plant species that interfere with management goals

Inventory populations of weeds located on and near the site. Map these populations, estimate the area(s) they cover, and note whether they are increasing, stable or decreasing. If possible, make one map with locations of all weed species populations shown and separate overlay maps for each weed species. You can use these maps as you develop specific control strategies for high-priority species (Section 3). This information should be updated annually.

2. OVERVIEW OF WEED MANAGEMENT PLAN

A. General Management Philosophy

Weed control is part of the overall site management and restoration program. We focus on the species and communities we want in place of the weed species, rather than on simply eliminating weeds. We will implement preventative programs to keep the site free of species that are not yet established there but which are known to be pests elsewhere in the region. We will set priorities for the control or elimination of weeds that have already established on the site, according to their actual and potential impacts on native species and communities, particularly on our conservation targets. We will take action only when careful consideration indicates leaving the weed unchecked will result in more damage than controlling it with available methods.

We use an adaptive management strategy. First, we establish and record the goals for the site. Second, we identify species that block us from reaching these goals and assign them priorities based on the severity of their impacts. Third, we consider methods for controlling them or otherwise diminishing their impacts and, if necessary, re-order priorities based on likely impacts on target and non-target species. Fourth, we develop weed control plans based on this information. Fifth, the plan is implemented, and results of our management actions monitored. Sixth, we evaluate the effectiveness of our methods in light of the site goals, and use this information to modify and improve control priorities, methods and plans. Finally, start the cycle again by establishing new/modified goals.

We set priorities in the hope of minimizing the total, long-term workload. Therefore, we act to prevent new infestations and assign highest priority to existing infestations that are the fastest growing, most disruptive, and affect the most highly valued area(s) of the site. We also consider the difficulty of control, giving higher priority to infestations we think we are most likely to control with available technology and resources.

Add more detailed information on how you set priorities. Use Table 1 in the weed template excel worksheet to list your priorities. What follows is a stepwise approach for prioritizing species and specific infestations for control. Another, more detailed, priority-setting system is presented in the Handbook for Ranking Exotic Plants for Management and Control (Hiebert and Stubbendieck 1993). A similar version of this system is available on the web at (<http://www.npwrc.usgs.gov/resource/2000/aprs/aprs.htm> /).

Setting Priorities

The priority-setting process can be difficult, partly because you need to consider so many factors. We find that it helps to group these factors into four categories that you can think of as filters designed to screen out the worst weeds:

- I. current extent of the species on or near the site;*
- II. current and potential impacts of the species;*
- III. value of the habitats/areas that the species infests or may infest; and*
- IV. difficulty of control.*

*The categories can be used in any order, however, we emphasize the importance of the **current extent of the species** category, and suggest it be used first. In the long run, it is usually most efficient to devote*

resources to preventing new problems and immediately addressing incipient infestations. Ignore categories that are unimportant on your site.

Below we suggest how species should be ranked within the four categories. If a species is described by more than one of the criteria in a given category, assign it the highest priority it qualifies for. You may assign priority in a ranking system (1, 2, 3..., n) or by class (e.g., A = worst weeds, B = bad weeds, C = minor pests).

I. Current extent of the species: Under this category, priorities are assigned to species in order to first, prevent the establishment of new weed species, second, eliminate small, rapidly-growing infestations, third, prevent large infestations from expanding, and fourth, reduce or eliminate large infestations. To do this, assign priorities in the following sequence:

1. Species not yet on the site but which are present nearby. Pay special attention to species known to be pests elsewhere in the region.
2. Species present as new populations or outliers of larger infestations, especially if they are expanding rapidly.
3. Species present in large infestations that continue to expand.
4. Species present in large infestations that are not expanding.

You may have to "live with" weeds/infestations you cannot control with available technology and resources. However, keep looking for innovations that might allow you to control them in the future.

II. Current and potential impacts of the species: Order priorities under this category based on the management goals for your site. We suggest the following sequence:

1. Species that alter ecosystem processes such as fire frequency, sedimentation, nutrient cycling, or other ecosystem processes. These are species that "change the rules of the game", often altering conditions so radically that few native plants and animals can persist.
2. Species that outcompete natives and dominate otherwise undisturbed native communities.
3. Species that do not outcompete dominant natives but:
 - a. prevent or depress recruitment or regeneration of native species (for example, the forest understory weed garlic mustard may depress recruitment by canopy dominants); OR
 - b. reduce or eliminate resources (e.g., food, cover, nesting sites) used by native animals; OR
 - c. promote populations of invasive non-native animals by providing them with resources otherwise unavailable in the area.
4. Species that overtake and exclude natives following natural disturbances such as fires, floods, or hurricanes, thereby altering succession, or that hinder restoration of natural communities. Note that species of this type should be assigned higher priority in areas subject to repeated disturbances.

III. Value of the habitats/areas the species infests or could infest: Assign priorities in the following order:

1. Infestations that occur in the most highly valued habitats or areas of the site - especially areas that contain rare or highly valued species or communities and areas that provide vital resources.

2. *Infestations that occur in less highly valued portions of the site. Areas already badly infested with other weeds may be given low priority unless the species in question will make the situation significantly worse.*

IV. Difficulty of control and establishing replacement species: Assign priorities in the following order:

1. *Species likely to be controlled or eliminated with available technology and resources and which desirable native species will replace with little further input.*
2. *Species likely to be controlled but will not be replaced by desirable natives without an active restoration program requiring substantial resources.*
3. *Species difficult to control with available technology and resources and/or whose control will likely result in substantial damage to other, desirable species.*
4. *Species unlikely to be controlled with available technology and resources.*

Finally, weed species whose populations are decreasing and/or those that colonize only disturbed areas and don't move into undisturbed habitats nor impact recovery from the disturbance can be assigned the lowest priorities.

B. Summary of Specific Actions Planned

Briefly (1-3 paragraphs) describe or outline your weed control plan. 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.

C. Tables

Open the Excel spreadsheet "WeedTabl.xls" and enter data into its tables. You may make hard copies of the tables, but you will not benefit from the automatic calculations in the computer version.

Table 1. Prioritized List of Weed Species

Set ranks or categories using Section 2B for guidelines.

Table 2. Weed Management Plan Implementation Schedule

Schedule the planning, surveying, and treatment for each target weed for at least the next year.

Table 3. Projected Resource Costs to Implement Weed Management Plan

Revise this table annually after comparing estimated to actual costs (obtained from Table 5).

Table 4. Itemized Actual Annual Cost and Labor Worksheet(s) for Each Target Weed

Enter data for each project or target weed to account for yearly costs and labor.

Table 5. Projected and Actual Resource Uses

After each year, examine the difference between actual and estimated resource costs. Use these results to estimate new resource costs for the upcoming year(s).

(copy this and next page for additional species)

3. SPECIFIC CONTROL PLANS FOR HIGH PRIORITY WEED SPECIES

Scientific name: _____ Common name: _____

Updated _____

A. PRIORITY _____

B. DESCRIPTION

(In 2-3 lines list habit, life history, native range, and other outstanding characteristics)

C. CURRENT DISTRIBUTION ON THE SITE

(Refer to maps, Section 1C)

D. DAMAGE & THREATS

(Outline damage caused and threats posed by the species. Refer to Section 1B)

E. GOALS

(Outline long-term goals for this species. For example, you may want to reduce numbers of this species so that it no longer threatens populations of a rare species or so that it does not affect fire frequencies on the site).

F. OBJECTIVES (Measurable)

(Establish measurable objectives for the planned control activities. Include:

- 1. the **impact** on numbers, density, cover, etc. that you want to achieve;*
- 2. the **size** of the area in which you hope to achieve this;*
- 3. the **period** in which you hope to achieve it.*

For example you may state your objectives in terms of reducing percent cover of the species by 50% over an area of 5 acres within 3 years. Another possible objective would be eliminating the species from the site within 2 years.)

G. MANAGEMENT OPTIONS

Viable control options are:

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

(Briefly discuss the alternatives, indicate which are preferred and the conditions (size of area treated, location, phenology, total anticipated cost, etc.) under which they may be used. Build in restricted flexibility to allow those carrying out the plan options; conditions in the field may differ from those you anticipated. State who the field-staff should contact when none of the listed alternatives can be carried out.)

H. ACTIONS PLANNED (Treatments and monitoring)

(Briefly describe the locations to be treated, 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.)

Scientific name: _____ Common name: _____
Updated _____

I. HOW ACTIONS WILL BE EVALUATED (Criteria for success)

(Outline the methods that will be used to monitor control activities and the criteria that will be used to evaluate success or failure of the program. The criteria for success should be based on the program's objectives and goals. If you develop forms to be used when collecting monitoring data, include copies as Appendix 6)

J. 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.)

K. RESULTS OF EVALUATION

(This section is to be filled in later, preferably within 1 year, when monitoring data has been taken and evaluated, at least preliminarily. The evaluation should be used to determine whether any of the sections B-K above should be modified.)

4. REFERENCES

List references cited or used.

5. APPENDICES

Appendix 1. EMERGENCY INFORMATION: DIRECTIONS AND MAP TO NEARBY HOSPITALS OR CLINICS

Be sure that phone numbers and directions are current.

Appendix 2. BLANK MAPS/SAMPLE MAPS

Attach copies of the blank map(s) of the preserve/site, and of (overlaid) maps depicting the extent of the target weed(s) on the site here.

Appendix 3. FORMS USED IN COLLECTING MONITORING DATA

Attach copies of data collection sheets here.

Use the following 3 appendices if herbicides are to be used.

Appendix 4. HERBICIDE USE PROTOCOLS

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.

You may use the "Policy, Procedures and Guidelines for Use of Herbicides on Land Managed by The Nature Conservancy" to complete this appendix. Copies are available from TNC's Weed Management & Research Program.

Appendix 5. HERBICIDE USE RECORD FORMS

When using herbicides it is critical (and, in many cases, required by law) to keep detailed records of all relevant information. Ideally, records would include data on the condition of the site prior to herbicide application, the type of species present, and percent cover of invasive and native species prior to application. This information will be valuable in evaluating the effectiveness of the herbicide. At the time of application, take detailed notes of the type and concentration of the herbicide, the amount, location, and method of application, weather conditions, and any other observations made during the course of application. This information is important in evaluating the project's success, improving methodology, and identifying mistakes. In addition, it documents the procedure for future site managers and biologists. As in Appendix 2, you may use "TNC's Policy, Procedures and Guidelines for Use of Herbicides..."

Appendix 6. HERBICIDE LABELS

Attach copies of the herbicide label(s) here.

ATTACHMENT B

Cal-IPC 2006 California Invasive Plant Inventory Table 1

TABLE 1: Invasive Non-Native Plants that Threaten Wildlands in California

Alert	Scientific Name	Common Name	Rating	Impacts	Invasiveness	Distribution	Doc. Level	Ecological Types Invaded and Other Comments	Regions Invaded
	<i>Acacia melanoxylon</i>	black acacia, blackwood acacia	Limited	C	C	B	2.7	Coniferous forest, chaparral, woodland, riparian. Impacts low in most areas.	NW, CW, SW
	<i>Acroptilon repens</i>	Russian knapweed	Moderate	B	B	B	3.2	Scrub, grasslands, riparian, pinyon-juniper woodland, forest. Severe impacts in other western states. Spreading in many areas of CA.	CA-FP, GB
	<i>Aegilops triuncialis</i>	barb goatgrass	High	A	A	B	3.6	Grassland, oak woodland. Spreading in NW and Central Valley.	CaR, CW, SN, GV
	<i>Ageratina adenophora</i>	croftonweed, eupatorium	Moderate	B	B	B	2.8	Coastal canyons, scrub, slopes. Very invasive in Australia, limited information and distribution in CA.	CW, SW
	<i>Agrostis avenacea</i>	Pacific bentgrass	Limited	C	C	C	2.4	Vernal pools, coastal prairie, meadows, grasslands. Impacts are low in most areas.	NW, SN, GV, CW, SW
	<i>Agrostis stolonifera</i>	creeping bentgrass	Limited	C	B	C	1.9	Wetlands, riparian; grown for domestic forage. Limited distribution and impacts unknown.	NW, SN, GV, CW, SW
	<i>Ailanthus altissima</i>	tree-of-heaven	Moderate	B	B	B	3.0	Riparian areas, grasslands, oak woodland. Impacts highest in riparian areas.	CA-FP
	<i>Alhagi maurorum</i> (= <i>A. pseudalhagi</i>)	camethorn	Moderate	B	B	B	3.2	Grassland, meadows, riparian and desert scrub, Sonoran thorn woodland. Very invasive in southwestern states. Limited distribution in CA.	GV, D, SNE
◆	<i>Alternanthera philoxeroides</i>	alligatorweed	High	A	B	C	2.9	Freshwater aquatic systems, including marshes	GV, SW
	<i>Amnophila arenaria</i>	European beachgrass	High	A	B	B	3.2	Coastal dunes	NW, CW, SW
	<i>Anthoxanthum odoratum</i>	sweet vernalgrass	Moderate	B	B	B	2.7	Coastal prairie, coniferous forest. Little information available on impacts and limited ecological range.	NW, SN, CW
◆	<i>Arctotheca calendula</i> (fertile strains)	fertile capeweed	Moderate	B	B	C	3.6	Coastal prairie. Can produce seed. Important agricultural weed in Australia, but limited distribution in CA.	NW, CW
	<i>Arctotheca calendula</i> (sterile strains)	sterile capeweed	Moderate	B	B	B	2.8	Coastal prairie. Only propagates vegetatively. More competitive than fertile form, but limited distribution.	NW, CW
	<i>Arundo donax</i>	giant reed	High	A	B	A	2.8	Riparian areas. Commercially grown for musical instrument reeds, structural material, etc.	CW, SN, GV, SW

Scientific names based on *The Jepson Manual*. For each species, the first common name is based on the Weed Science Society of America's "Composite List of Weeds" (www.wssa.net), followed by other names used in California. Scores: A = Severe, B = Moderate, C = Limited, D = None, U = Unknown. Documentation level averaged. Regions invaded based on Jepson geographic regions. Plant assessment forms, literature citations, and full rating criteria available at www.cal-ipc.org.

TABLE 1: Invasive Non-Native Plants that Threaten Wildlands in California (continued)

Alert	Scientific Name	Common Name	Rating	Impacts	Invasiveness	Distribution	Doc. Level	Ecological Types Invaded and Other Comments	Regions Invaded
◆	<i>Asparagus asparagoides</i>	bridal creeper	Moderate	B	B	D	2.6	Riparian woodland	CW, SW
◆	<i>Asphodelus fistulosus</i>	onionweed	Moderate	B	A	C	2.9	Coastal dunes, prairie, grasslands. Invasive in Australia. High invasiveness but limited distribution in CA.	GV, SW
	<i>Atriplex semibaccata</i>	Australian saltbush	Moderate	B	B	B	2.9	Coastal grasslands, scrub, upper salt marsh. Limited distribution, but can be very invasive regionally.	CA except CaR and SN
	<i>Avena barbata</i>	slender wild oat	Moderate	B	B	A	3.5	Coastal scrub, grasslands, oak woodland, forest. Very widespread, but impacts more severe in desert regions.	CA-FP, MP, DMoj
	<i>Avena fatua</i>	wild oat	Moderate	B	B	A	3.2	Coastal scrub, chaparral, grasslands, woodland, forest. Very widespread, but impacts more severe in desert regions.	CA-FP, MP, DMoj
	<i>Bassia hyssopifolia</i>	fivehook bassia	Limited	C	C	B	2.7	Alkaline habitats. Weed of agriculture or disturbed sites. Impacts minor in wildlands.	CA except NW
	<i>Bellardia trixago</i>	bellardia	Limited	C	C	C	1.9	Grasslands, including serpentine. Impacts and invasiveness appear to be minor.	NW, CW
◆	<i>Brachypodium sylvaticum</i>	perennial false-brome	Moderate	B	A	D	2.5	Redwoods and mixed evergreen forest in Santa Cruz Mtns. Expanding range rapidly in OR, potentially very invasive.	CW
	<i>Brassica nigra</i>	black mustard	Moderate	B	B	A	2.0	Widespread. Primarily a weed of disturbed sites, but can be locally a more significant problem in wildlands.	CA-FP
	<i>Brassica rapa</i>	birdsrape mustard, field mustard	Limited	C	B	B	1.8	Coastal scrub, grasslands meadows, riparian. Primarily in disturbed areas. Impacts appear to be minor or unknown in wildlands.	CA-FP
	<i>Brassica tournefortii</i>	Saharan mustard, African mustard	High	A	A	B	2.3	Desert dunes, desert and coastal scrub	SW, D
	<i>Briza maxima</i>	big quakinggrass, rattlesnakegrass	Limited	B	C	B	2.3	Grasslands. Widespread in coast range. Impacts generally minor, but locally can be higher.	NW, SN, CW, SW
	<i>Bromus diandrus</i>	ripgut brome	Moderate	B	B	A	3.3	Dunes, scrub, grassland, woodland, forest. Very wide-spread, but monotypic stands uncommon.	CA

Scientific names based on *The Jepson Manual*. For each species, the first common name is based on the Weed Science Society of America's "Composite List of Weeds" (www.wssa.net), followed by other names used in California. Scores: A = Severe, B = Moderate, C = Limited, D = None, U = Unknown. Documentation level averaged. Regions invaded based on Jepson geographic regions. Plant assessment forms, literature citations, and full rating criteria available at www.cal-ipc.org.

TABLE 1: Invasive Non-Native Plants that Threaten Wildlands in California (continued)

Alert	Scientific Name	Common Name	Rating	Impacts	Invasiveness	Distribution	Doc. Level	Ecological Types Invaded and Other Comments	Regions Invaded
	<i>Bromus hordeaceus</i>	soft brome	Limited	B	C	A	2.8	Grasslands, sagebrush, serpentine soils, many other habitats. Very widespread, but primarily in converted annual grasslands.	CA
	<i>Bromus madriensis</i> ssp. <i>rubens</i> (= <i>B. rubens</i>)	red brome	High	A	B	A	3.0	Scrub, grassland, desert washes, woodlands. Impacts most significant in desert areas.	CA
	<i>Bromus tectorum</i>	downy brome, cheatgrass	High	A	B	A	3.1	Interior scrub, woodlands, grasslands. Most widely distributed invasive plant in the US.	SN, GB, D
	<i>Calce maritima</i>	European sea-rocket	Limited	C	B	B	3.6	Coastal dunes. Widespread, but impacts appear to be minor.	NW, CW, SW
◆	<i>Cardaria chalapensis</i> (= <i>C. draba</i> ssp. <i>chalapensis</i>)	lens-podded whitetop	Moderate	B	B	C	3.2	Central Valley wetlands. Limited distribution in CA. May not be as invasive as <i>C. draba</i> .	CA-FP, GB
	<i>Cardaria draba</i>	hoary cress	Moderate	B	B	B	2.6	Riparian areas, marshes of central coast. More severe invasive in northern CA.	CW, SW
	<i>Cardaria pubescens</i>	hairy whitetop	Limited	C	B	C	2.5	Grasslands and meadows. Impacts unknown but may be significant in meadows of Cascade Range.	GV, SW
	<i>Carduus acanthoides</i>	plumeless thistle	Limited	B	C	C	3.0	Valley and foothill grasslands. Limited distribution in CA, impacts higher locally.	NW, SN, CW
	<i>Carduus nutans</i>	musk thistle	Moderate	B	B	B	3.1	Grasslands. More invasive in other western states. Limited distribution in CA.	NW, CaR, SN
	<i>Carduus pycnocephalus</i>	Italian thistle	Moderate	B	B	A	2.9	Forest, scrub, grasslands, woodland. Very widespread. Impacts may be variable regionally.	NW, SN, CW, SW
	<i>Carduus tenuiflorus</i>	slenderflower thistle	Limited	C	C	B	2.8	Valley and foothill grasslands. Limited distribution. Impacts appear to be minor.	NW, SN, CW, SW
	<i>Carpobrotus chilensis</i> (and <i>C. edulis</i> x <i>chilensis</i> hybrids)	sea-fig, iceplant	Moderate	B	B	A	1.8	Coastal dunes, scrub, prairie. Little information on species, most inferred from <i>C. edulis</i> .	NW, CW, SW
	<i>Carpobrotus edulis</i>	Hottentot-fig, iceplant	High	A	B	A	3.3	Coastal habitats, especially dunes	NW, CW, SW
◆	<i>Carthamus lanatus</i>	woolly distaff thistle	Moderate	A	B	C	2.8	Grasslands. Expanding in coast ranges, may become more severe. Current distribution limited.	NW, SN, CW

Scientific names based on *The Jepson Manual*. For each species, the first common name is based on the Weed Science Society of America's "Composite List of Weeds" (www.wssa.net), followed by other names used in California. Scores: A = Severe, B = Moderate, C = Limited, D = None, U = Unknown. Documentation level averaged. Regions invaded based on Jepson geographic regions. Plant assessment forms, literature citations, and full rating criteria available at www.cal-ipc.org.

TABLE 1: Invasive Non-Native Plants that Threaten Wildlands in California (continued)

Alert	Scientific Name	Common Name	Rating	Impacts	Invasiveness	Distribution	Doc. Level	Ecological Types Invaded and Other Comments	Regions Invaded
	<i>Centaurea calcitrapa</i>	purple starthistle	Moderate	B	B	B	2.7	Grasslands. Impacts regionally variable. Relatively limited distribution.	NW, SN, GV, CW, SW
◆	<i>Centaurea debentxii</i> (= <i>C. jacea</i> x <i>C. nigra</i> , <i>C. x pratensis</i>)	meadow knapweed	Moderate	B	B	C	2.7	Grasslands. Spreading rapidly in NW CA, but limited distribution elsewhere. Little known of impacts.	NW, CW
	<i>Centaurea diffusa</i>	diffuse knapweed	Moderate	B	B	B	3.3	Great Basin scrub, coastal prairie. Severe impacts in other western states. Limited distribution in CA with impacts higher in some locations.	Ca-R, CW, NW, SN
	<i>Centaurea maculosa</i> (= <i>C. hibersteinii</i>)	spotted knapweed	High	A	B	B	3.4	Riparian, grasslands, wet meadows, forests. More widely distributed in other western states.	CA-FP, GB
	<i>Centaurea melitensis</i>	Malta starthistle, tocalote	Moderate	B	B	B	2.6	Grasslands, oak woodland. Sometimes misidentified as <i>C. solstitialis</i> . Impacts vary regionally.	CW, SW, D
	<i>Centaurea solstitialis</i>	yellow starthistle	High	A	B	A	3.0	Grasslands, woodlands, occasionally riparian	CA-FP
	<i>Centaurea virgata</i> var. <i>squarrosa</i> (= <i>C. squarrosa</i>)	squarrose knapweed	Moderate	B	B	B	2.8	Scrub, grassland, pinyon-juniper woodland. Highly invasive in Utah and other western states. Limited distribution in CA.	NW, CaR, MP
	<i>Chondrilla juncea</i>	rush skeletonweed	Moderate	B	B	B	3.1	Grasslands. Very invasive in other western states, but currently limited distribution in CA.	NW, CaR, SN, GV, CW,
	<i>Chrysanthemum coronarium</i>	crown daisy	Moderate	B	B	B	2.0	Coastal prairie, dunes, and scrub. Impacts generally low to moderate, but can vary regionally.	CW, SW
	<i>Cirsium arvense</i>	Canada thistle	Moderate	B	B	B	2.8	Grasslands, riparian areas, forests. Severe impacts in other western states. Limited distribution in CA.	CA-FP, DMoj
	<i>Cirsium vulgare</i>	bull thistle	Moderate	B	B	B	3.3	Riparian areas, marshes, meadows. Widespread, can be very problematic regionally.	CA-FP, GB
	<i>Conicosia pugioniformis</i>	narrowleaf iceplant	Limited	C	B	C	2.1	Coastal dunes, scrub, grassland. Limited distribution. Impacts generally minor but can be higher locally.	CW
	<i>Conium maculatum</i>	poison-hemlock	Moderate	B	B	B	2.8	Riparian woodland, grassland. Widespread in disturbed areas. Abiotic impacts unknown. Impacts can vary locally.	CA-FP

Scientific names based on *The Jepson Manual*. For each species, the first common name is based on the Weed Science Society of America's "Composite List of Weeds" (www.wssa.net), followed by other names used in California. Scores: A = Severe, B = Moderate, C = Limited, D = None, U = Unknown. Documentation level averaged. Regions invaded based on Jepson geographic regions. Plant assessment forms, literature citations, and full rating criteria available at www.cal-ipc.org.

TABLE 1: Invasive Non-Native Plants that Threaten Wildlands in California (continued)

Alert	Scientific Name	Common Name	Rating	Impacts		Invasiveness		Distribution	Doc. Level	Ecological Types Invaded and Other Comments	Regions Invaded
				C	C	C	C				
	<i>Cordylone australis</i>	giant dracaena, New Zealand-cabbage tree	Limited	C	C	C	C	2.0		Coniferous forest. Two reports of horticultural escape into wildlands. Appears best suited to moist, cool climates.	NW, CW
	<i>Cortaderia jubata</i>	jubatagrass	High	A	A	A	A	3.1		Many coastal and interior habitats	NW, CW, SW
	<i>Cortaderia selloana</i>	pampasgrass	High	A	A	B	B	3.2		Coastal dunes, coastal scrub, Monterey pine, riparian, grasslands, wetlands, serpentine soils. Still spreading both coastal and inland.	CW, SW
	<i>Cotoneaster franchetii</i>	orange cotoneaster	Moderate	B	A	B	B	2.6		Coniferous forest. Limited distribution. Abiotic impacts largely unknown.	NW, CW
	<i>Cotoneaster lacteus</i>	Parney's cotoneaster	Moderate	B	B	B	B	2.1		Many coastal habitats, mainly a problem from SF Bay Area north along coast. Limited distribution. Abiotic impacts largely unknown.	NW, CW
	<i>Cotoneaster pannosus</i>	silverleaf cotoneaster	Moderate	B	A	B	B	2.5		Many coastal habitats, mainly a problem from SF Bay Area north along coast. Limited distribution. Abiotic impacts largely unknown.	NW, CW
	<i>Conula coronopifolia</i>	brassbuttons	Limited	C	C	B	B	2.2		Salt and freshwater marshes. Impacts largely unknown, but appear to be minor.	NW, CW, SW
	<i>Crataegus monogyna</i>	English hawthorn	Limited	C	B	C	C	3.4		Riparian habitats, woodland. Limited distribution. Impacts appear to be minor.	NW, CW, SW
	<i>Crocosmia x crocosmiiflora</i>	montbretia	Limited	C	B	B	B	2.6		Coastal scrub and prairie, north coast forests. Abiotic impacts unknown. Higher invasiveness in some areas.	NW, CW
	<i>Crupina vulgaris</i>	common crupina, bearded creeper	Limited	B	C	B	B	3.2		Forest, woodland, grassland. Limited distribution. More invasive in other western states.	NW, MP
	<i>Cynara cardunculus</i>	artichoke thistle	Moderate	B	B	B	B	4.0		Coastal grasslands. Impacts more severe in southern CA where monotypic stands are more common.	CW, SW
	<i>Cynodon dactylon</i>	bermudagrass	Moderate	B	B	B	B	3.3		Riparian scrub in southern CA. Common landscape weed, but can be very invasive in desert washes.	SW, DSON
	<i>Cynoglossum officinale</i>	houndstongue	Moderate	B	B	B	B	2.5		Woodland, forest, interior dunes. Abiotic impacts unknown. Limited distribution. Can have impacts in other western states.	CaR, SN

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TABLE 1: Invasive Non-Native Plants that Threaten Wildlands in California (continued)

Alert	Scientific Name	Common Name	Rating	Impacts	Invasiveness	Distribution	Doc. Level	Ecological Types Invaded and Other Comments	Regions Invaded
	<i>Cynosurus echinatus</i>	hedgehog dogtailgrass	Moderate	B	B	A	2.5	Oak woodland, grassland. Widespread, impacts vary regionally, but typically not in monotypic stands.	NW, SN, GV, CW, SW
	<i>Cytisus scoparius</i>	Scotch broom	High	A	B	A	3.2	Coastal scrub, oak woodland, horticultural varieties may also be invasive.	CA-FP
	<i>Cytisus striatus</i>	Portuguese broom	Moderate	B	B	B	2.7	Coastal scrub, grasslands. Often confused with <i>C. scoparius</i> . Limited distribution.	NW, CW, SW
	<i>Daactylis glomerata</i>	orchardgrass	Limited	C	B	B	2.9	Grasslands, broadleaved forest, woodlands. Common forage species. Impacts appear to be minor.	CA-FP
	<i>Delairea odorata</i> (= <i>Senecio mikanioides</i>)	Cape-ivy, Getman-ivy	High	A	A	B	3.1	Coastal, occasionally other riparian areas.	CW, SW
	<i>Descurainia sophia</i>	flixweed, tansy mustard	Limited	C	B	B	1.9	Scrub, grassland, woodland. Impacts appear to be minor, but locally more invasive in NE CA.	CA
	<i>Digitalis purpurea</i>	foxglove	Limited	C	B	B	2.4	Forest, woodland. Widely escaped ornamental. Impacts largely unknown or appear to be minor.	NW, SN, CW
	<i>Dipsacus fullonum</i>	common teasel	Moderate	B	B	B	3.8	Grasslands, seep, riparian scrub. Impacts regionally variable, forms dense stands on occasion.	NW, CW, SN
	<i>Dipsacus sativus</i>	fuller's teasel	Moderate	B	B	B	3.8	Grasslands, seep, bogs. Impacts regionally variable, forms dense stands on occasion.	NW, CW, SW
♦	<i>Ditrichia graveolens</i>	stinkwort	Moderate	B	A	C	3.0	Grasslands, riparian scrub. Spreading rapidly, impacts may become more important in future.	NW, SN, CW, GV, SW
	<i>Echium caudicans</i>	pride-of-Madeira	Limited	C	B	B	1.5	Two escaped populations near Big Sur and San Eljijo Lagoon. Little information on impacts.	CW, NW, SW
	<i>Egeria densa</i>	Brazilian egeria	High	A	A	B	3.1	Streams, ponds, sloughs, lakes, Sacramento-San Joaquin Delta	SN, GV, SW
	<i>Elytharta calycina</i>	purple veldtgrass	High	A	A	B	3.4	Sandy soils, especially dunes. Rapidly spreading on central coast.	CW, SW
	<i>Elytharta erecta</i>	erect veldtgrass	Moderate	B	B	B	2.2	Scrub, grasslands, woodland, forest. Spreading rapidly. Impacts may become more important in future.	CW, SW

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TABLE 1: Invasive Non-Native Plants that Threaten Wildlands in California (continued)

Alert	Scientific Name	Common Name	Rating	Impacts	Invasiveness	Distribution	Doc. Level	Ecological Types Invaded and Other Comments	Regions Invaded
◆	<i>Ehrharta longiflora</i>	long-flowered veldtgrass	Moderate	B	B	C	2.8	Coastal scrub. Limited distribution, but spreading rapidly in southern CA. Impacts largely unknown.	SW
◆	<i>Eichhornia crassipes</i>	water hyacinth	High	A	A	C	3.2	Aquatic systems in Sacramento-San Joaquin Delta	GV, CW, SW
	<i>Elaeagnus angustifolia</i>	Russian-olive	Moderate	B	A	B	3.3	Interior riparian. Impacts more severe in other western states. Current distribution limited in CA.	GV, CW, DMoj
◆	<i>Emex spinosa</i>	spiny emex, devil's-thorn	Moderate	B	B	D	1.6	Edges of beaches, other coastal habitats. Invasive in other states and countries. Spreading rapidly in southern CA. Impacts not well known.	SW
	<i>Erechtites glomerata</i> , <i>E. minima</i>	Australian fireweed, Australian burnweed	Moderate	C	B	A	3.2	Coastal woodland, scrub, forests. Widespread on coast, but impacts low overall. May vary locally.	NW, CW
	<i>Erodium cicutarium</i>	redstem filaree	Limited	C	C	A	3.1	Many habitats. Widespread. Impacts minor in wildlands. High-density populations are transient.	CA
	<i>Eucalyptus camaldulensis</i>	red gum	Limited	C	C	C	2.2	Mainly southern CA urban areas. Impacts, invasiveness and distribution all minor.	NW, GV, CW, SW
	<i>Eucalyptus globulus</i>	Tasmanian blue gum	Moderate	B	B	B	2.8	Riparian areas, coastal grasslands, scrub. Impacts can be much higher in coastal areas.	NW, GV, CW, SW
◆	<i>Euphorbia esula</i>	leafy spurge	High	A	A	C	3.5	Forests, woodlands, juniper forest. More widespread invasive in northern states.	NW, CaR, MP
	<i>Euphorbia oblongata</i>	oblong spurge	Limited	C	C	B	2.0	Meadows, woodlands. Limited distribution. Impacts unknown. Locally in dense stands.	GV, CW
◆	<i>Euphorbia terracina</i>	camation spurge	Moderate	B	B	C	1.7	Coastal scrub. Limited distribution. Spreading in southern CA. Impacts unknown.	SW
	<i>Festuca arundinacea</i>	tall fescue	Moderate	B	B	A	2.9	Coastal scrub, grasslands; common forage grass. Widespread, abiotic impacts unknown.	CA-FP
	<i>Ficus carica</i>	edible fig	Moderate	B	A	B	2.6	Riparian woodland. Can spread rapidly. Abiotic impacts unknown. Can be locally very problematic.	CW, SW, GV
	<i>Foeniculum vulgare</i>	fennel	High	A	B	A	3.0	Grasslands, scrub.	CA-FP

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TABLE 1: Invasive Non-Native Plants that Threaten Wildlands in California (continued)

Alert ♦	Scientific Name	Common Name	Rating	Impacts		Invasiveness	Distribution	Doc. Level	Ecological Types Invaded and Other Comments	Regions Invaded
	<i>Genista monspessulana</i>	French broom	High	A	B	A	B	3.2	Coastal scrub, oak woodland, grasslands. Horticultural selections may also be invasive.	NW, CW, SW
	<i>Geranium dissectum</i>	cutleaf geranium	Limited	C	B	A	A	1.7	Numerous habitats but impacts appear minor.	CA-FP
	<i>Glyceria declinata</i>	waxy mannagrass	Moderate	B	B	B	B	1.9	Vernal pools, moist grasslands. Often confused with native <i>Glyceria</i> . Impacts largely unknown, but may be significant in vernal pools.	GV
	<i>Halogeton glomeratus</i>	halogeton	Moderate	B	A	B	B	3.0	Scrub, grasslands, pinyon-juniper woodland. Larger problem in NV. Monotypic stands are rare.	CaR, DMoj, GB
	<i>Hedera helix</i> , <i>H. canariensis</i>	English ivy, Algerian ivy	High	A	A	A	A	2.7	Coastal forests, riparian areas. Species combined due to genetics questions.	CA-FP
	<i>Helichrysum petiolare</i>	licoriceplant	Limited	C	B	C	C	2.0	North coastal scrub. Limited distribution. Impacts unknown, but can form dense stands.	NW, CW
	<i>Hirschfeldia incana</i>	shortpod mustard, summer mustard	Moderate	B	B	A	A	1.9	Scrub, grasslands, riparian areas. Impacts not well understood, but appear to be greater in southern CA.	CW, GV, NW, SN, SW
	<i>Holcus lanatus</i>	common velvet-grass	Moderate	B	B	A	A	2.9	Coastal grasslands, wetlands. Impacts can be more severe locally, especially in wetland areas.	CA-FP, DMoj, GB
	<i>Hordeum maritimum</i> , <i>H. murinum</i>	Mediterranean barley, hare barley, wall barley	Moderate	B	B	A	A	2.8	Grasslands. <i>H. maritimum</i> invades drier habitats, while <i>H. murinum</i> invades wetlands. Widespread, but generally do not form dominant stands.	CA
♦	<i>Hydrilla verticillata</i>	hydrilla	High	A	B	C	C	3.2	Freshwater aquatic systems. The most important submerged aquatic invasive in southern states.	NW, SN, GV, SW, D
♦	<i>Hypericum canariense</i>	Canary Island hypericum	Moderate	B	B	C	C	1.2	Coastal scrub, prairie. Impacts unknown. Limited distribution. Spreading rapidly on central coast.	SW, CW
	<i>Hypericum perforatum</i>	common St. Johnswort, klamathweed	Moderate	B	B	B	B	3.7	Many northern CA habitats. Abiotic impacts low. Biological control agents have reduced overall impact.	SN, CW, GV, NW, SW
	<i>Hypochaeris glabra</i>	smooth catsear	Limited	C	B	B	B	3.1	Scrub and woodlands. Widespread. Impacts appear to be minor. Some local variability.	CA-FP
	<i>Hypochaeris radicata</i>	rough catsear, hairy dandelion	Moderate	C	B	A	A	2.2	Coastal dunes, scrub, and prairie, woodland, forest. Widespread. Impacts unknown or appear to be minor.	CA-FP

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TABLE 1: Invasive Non-Native Plants that Threaten Wildlands in California (continued)

Alert	Scientific Name	Common Name	Rating	Impacts	Invasiveness	Distribution	Doc. Level	Ecological Types Invaded and Other Comments	Regions Invaded
◆	<i>Ilex aquifolium</i>	English holly	Moderate	B	B	C	2.7	North coast forests. Expanding range south from Oregon.	CW, NW
	<i>Iris pseudacorus</i>	yellowflag iris	Limited	C	B	C	2.3	Riparian, wetland areas, especially southern CA. Limited distribution. Abiotic impacts unknown.	SN, GV, CW, SW
	<i>Isatis tinctoria</i>	dyer's woad	Moderate	B	B	A	3.0	Great Basin scrub and grasslands, coniferous forest. More severe impacts in other western states, but can be locally very invasive in northern CA.	CaR, NW, SN, MP
	<i>Kochia scoparia</i>	kochia	Limited	B	C	B	3.2	Scrub, chaparral, grasslands. Primarily a weed of disturbed sites.	CW, GV, D, GB
	<i>Lepidium latifolium</i>	perennial pepper-weed, tall whitetop	High	A	A	A	3.1	Coastal and inland marshes, riparian areas, wetlands, grasslands. Has potential to invade montane wetlands.	CA-FP, GB
	<i>Leucanthemum vulgare</i>	oxeye daisy	Moderate	B	B	B	2.5	Montane meadows, coastal grasslands, coastal scrub. Expanding range, invasiveness varies locally.	CW, NW, SN, SW
	<i>Linaria genisifolia</i> ssp. <i>dalmatica</i> (= <i>L. dalmatica</i>)	Dalmatian toadflax	Moderate	B	B	B	2.8	Grasslands, forest clearings. Limited distribution. More severe impacts in other western states.	CA-FP
	<i>Lobularia maritima</i>	sweet alyssum	Limited	C	B	B	2.4	Coastal dune, coastal scrub, coastal prairie, riparian.	NW, CW, SW
	<i>Lolium multiflorum</i>	Italian ryegrass	Moderate	B	B	A	2.6	Grasslands, oak woodland, pinyon-juniper woodland; widely used for post-fire erosion control. Widespread. Impacts can vary with region.	CA-FP
	<i>Ludwigia peploides</i> ssp. <i>montevidensis</i>	creeping water-primrose	High	A	B	B	2.5	Freshwater aquatic systems. Clarification needed on taxonomic identification.	NW, SN, GV, CW, SW, DMoj
◆	<i>Ludwigia hexapetala</i> (= <i>L. uruguayensis</i>)	Uruguay water-primrose	High	A	B	C	2.6	Freshwater aquatic systems. Clarification needed on taxonomic identification.	NW, CW, SW
	<i>Lythrum hyssopifolium</i>	hyssop loosestrife	Limited	C	B	B	3.0	Grasslands, wetlands, vernal pools. Widespread. Impacts unknown, but appear to be minor.	CA-FP
	<i>Lythrum salicaria</i>	purple loosestrife	High	A	A	B	3.8	Wetlands, marshes, riparian areas	NW, GV, MP
	<i>Marrubium vulgare</i>	white horehound	Limited	C	C	B	2.8	Grasslands scrub, riparian areas. Widespread. Rarely in dense stands. Impacts relatively minor.	CA-FP, DMoj

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TABLE 1: Invasive Non-Native Plants that Threaten Wildlands in California (continued)

Alert	Scientific Name	Common Name	Rating	Impacts	Invasiveness	Distribution	Doc. Level	Ecological Types Invaded and Other Comments	Regions Invaded
	<i>Medicago polymorpha</i>	California burclover	Limited	C	C	A	2.8	Grasslands. Widespread weed of agriculture and disturbed areas. Impacts in wildlands minor.	CA-FP
	<i>Mentha pulegium</i>	pennyroyal	Moderate	C	A	A	2.7	Vernal pools, wetlands. Poisonous to livestock. Spreading rapidly. Impacts largely unknown.	CW, GV, NW, SW
◆	<i>Mesembryanthemum crystallinum</i>	crystalline iceplant	Moderate	B	B	C	3.7	Coastal bluffs, dunes, scrubs, grasslands. Limited distribution. Locally problematic, especially in southern CA.	CW, NW, SW
	<i>Myoporum laetum</i>	myoporum	Moderate	B	B	B	2.6	Coastal habitats, riparian areas. Mostly along the southern coast. Abiotic impacts unknown.	CW, SW
	<i>Myosotis latifolia</i>	common forget-me-not	Limited	C	B	B	2.2	Coniferous forest, riparian. Little information on impacts.	CA-FP
◆	<i>Myriophyllum aquaticum</i>	parrotfeather	High	A	B	C	2.8	Freshwater aquatic systems	NW, CaR, CW, SW
	<i>Myriophyllum spicatum</i>	Eurasian watermilfoil	High	A	A	B	2.8	Freshwater aquatic systems	SN, GV, CW
	<i>Nicotiana glauca</i>	tree tobacco	Moderate	B	B	B	2.5	Coastal scrub, grasslands, riparian woodland. Abiotic impacts unknown. Impacts vary locally. Rarely in dense stands.	NW, SN, GV, SW, D
	<i>Olea europaea</i>	olive	Limited	C	B	B	2.5	A problem in Australia. Rarely escapes in CA but is a concern due to the possibility of spread from planted groves.	CW, GV, NW, SW
	<i>Ononis alopecuroides</i>	foxtail restharrow	Limited	C	B	C	2.2	Grasslands, oak woodland. Highly invasive but impacts unknown. Nearly eradicated.	CW
	<i>Onopordum acanthium</i>	Scotch thistle	High	A	B	B	2.9	Wet meadows, sage brush, riparian areas	CA-FP, MP
	<i>Oxalis pes-caprae</i>	buttercup oxalis, Bermuda buttercup, yellow oxalis	Moderate	B	B	B	2.9	Coastal dunes, scrub, oak woodland. Impacts in coastal areas may prove more severe in time.	CW, NW, SW
	<i>Parentucellia viscosa</i>	yellow glandweed, sticky parentucellia	Limited	C	B	B	2.5	Coastal prairie, grassland, and dunes. Impacts unknown, but can be locally significant.	NW, CaR, SN, CW, SW
	<i>Pennisetum clandestinum</i>	kikuyugrass	Limited	C	C	B	2.3	Present at low levels in numerous wildland habitats. Impacts unknown. Common turf weed.	NW, CW, SW

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TABLE 1: Invasive Non-Native Plants that Threaten Wildlands in California (continued)

Scientific Name	Common Name	Rating	Impacts	Invasiveness	Distribution	Doc. Level	Ecological Types Invaded and Other Comments	Regions Invaded
<i>Pennisetum setaceum</i>	crimson fountaingrass	Moderate	B	B	B	2.9	Coastal dunes and scrub, chaparral, grasslands. Some horticultural cultivars sterile. Very invasive in Hawaii.	CW, NW, SN, SW
<i>Phalaris aquatica</i>	hardinggrass	Moderate	B	B	B	2.6	Coastal sites, especially moist soils. Limited distribution. Can be highly invasive locally.	CW, NW, SN, SW
<i>Phoenix canariensis</i>	Canary Island date palm	Limited	C	B	D	2.3	Desert washes; agricultural crop plant. Limited distribution in southern CA. Impacts can be higher locally.	CW, SW
<i>Picris echioides</i>	bristly oxtongue	Limited	C	B	B	2.4	Coastal prairie, scrub, riparian woodland. Widespread locally. Abiotic impacts unknown.	CA-FP
<i>Piptatherum miliaceum</i>	smilgrass	Limited	C	B	B	2.4	Coastal dunes, scrub, riparian, grassland. Expanding range. Impacts largely unknown.	GV, CW, SW
<i>Plantago lanceolata</i>	buckhorn plantain, English plantain	Limited	C	C	B	2.1	Many habitats. Turf weed primarily. Low density and impact in wildlands.	CA-FP
<i>Poa pratensis</i>	Kentucky bluegrass	Limited	C	B	B	2.7	Grasslands scrub, riparian areas. Widespread turf plant. Abiotic impacts unknown.	CA
◆ <i>Polygonum cuspidatum</i> (= <i>Fallopia japonica</i>)	Japanese knotweed	Moderate	B	B	D	2.7	Riparian areas, wetlands, forest edges. More severe impacts in NW wetlands. Distribution limited in CA.	NW, CaR, SN, GV, CW
◆ <i>Polygonum sachalinense</i>	Sakhalin knotweed	Moderate	B	A	D	2.5	Riparian areas. More severe impacts in NW wetlands. Distribution limited in CA.	NW, CaR, SN, GV, CW
<i>Polygonum monspeliensis</i> and subsp.	rabbitfoot polygon, rabbitfoot grass	Limited	C	C	B	2.3	Margins of ponds and streams, seasonally wet places, edge of coastal dunes. Widespread. Impacts appear to be minor.	CA
<i>Potamogeton crispus</i>	curlyleaf pondweed	Moderate	B	B	B	3.2	Freshwater aquatic systems. Can be very invasive locally.	NW, GV, CW, SW, DMoj
<i>Prunus cerasifera</i>	cherry plum, wild plum	Limited	C	B	B	1.8	Riparian habitats, chaparral, woodland. Limited distribution. Abiotic impacts unknown.	NW, CW
<i>Pyracantha angustifolia</i> , <i>P. crenulata</i> , <i>P. coccinea</i>	pyracantha, firethorn	Limited	C	B	B	2.8	Coastal scrub and prairie, riparian areas. Horticultural escape. Impacts unknown or minor.	NW, CW, SW
<i>Ranunculus repens</i>	creeping buttercup	Limited	C	C	B	2.9	Riparian areas, coniferous forest. Impacts appear to be minor to negligible in most areas.	NW, CaR, SN, CW, SW
<i>Raphanus sativus</i>	radish	Limited	C	C	B	2.5	Present at low levels in numerous habitats. Widespread in disturbed sites.	CA-FP

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◆	<i>Retama monosperma</i>	bridal broom	Moderate	B	B	C	1.8	Coastal scrub. Can spread rapidly but largely if uncontrolled. Limited distribution in CA.	SW
	<i>Ricinus communis</i>	castorbean	Limited	C	B	B	2.5	Coastal scrub and prairie, riparian areas. Widespread in southern CA. Impacts locally variable.	GV, CW, SW
	<i>Robinia pseudacacia</i>	black locust	Limited	C	B	B	2.8	Riparian areas, canyons. Severe impacts in southern states. Impacts minor in CA.	CA-FP, GB
	<i>Rubus armeniacus</i> (= <i>R. discolor</i>)	Himalaya blackberry	High	A	A	A	3.0	Riparian areas, marshes, oak woodlands	CA-FP
	<i>Rumex acetosella</i>	red sorrel, sheep sorrel	Moderate	B	B	A	2.3	Many habitats, riparian areas, forest, wetlands. Widespread. Abiotic impacts unknown. Impacts can vary locally.	CA-FP
	<i>Rumex crispus</i>	curly dock	Limited	C	C	A	2.7	Grasslands, vernal pool, meadows, riparian. Widespread. Impacts appear to be minor.	CA
	<i>Salsola paulsenii</i>	barbwire Russian-thistle	Limited	C	C	C	2.9	Desert and Great Basin scrub. Limited distribution. Impacts in desert appear to be minor.	SW, SNE, DMoj
	<i>Salsola tragus</i> (= <i>S. kali</i>)	Russian-thistle	Limited	C	B	B	2.8	Desert dunes and scrub, alkali playa. Widespread. Impacts minor in wildlands.	CA
	<i>Salvia aethiopsis</i>	Mediterranean sage	Limited	C	B	B	2.5	Sagebrush, juniper, bunchgrass. Limited distribution. Impacts minor but can be locally higher.	MP
◆	<i>Salvinia molesta</i>	giant salvinia	High	A	A	C	2.9	Freshwater aquatic systems	CW, DSon
◆	<i>Sapium sebiferum</i> (= <i>Triadica sebifera</i>)	Chinese tallowtree	Moderate	B	B	C	3.2	Riparian areas. Impacts severe in southeast US. Limited distribution, but spreading rapidly regionally.	GV
	<i>Saponaria officinalis</i>	bouncingbet	Limited	C	B	C	2.5	Riparian scrub and woodland. Impacts unknown or minor, but appear to be locally variable.	NW, GV, CW, SW, GB
	<i>Schinus molle</i>	Peruvian peppertree	Limited	C	B	B	2.5	Riparian. Limited distribution. Impacts largely unknown in CA.	GV, SN, CW, SW
	<i>Schinus terebinthifolius</i>	Brazilian peppertree	Limited	C	B	C	2.6	Riparian. Very invasive in tropics. Abiotic impacts unknown, but appear significant locally.	SW

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	<i>Schismus arabicus</i> , <i>S. barbatus</i>	Mediterranean-grass	Limited	B	C	A	2.3	Scrub, thorn woodland. Widespread in deserts. Impacts can be more important locally.	GV, CW, SW, D
	<i>Senecio jacobaea</i>	tansy ragwort	Limited	C	B	B	2.8	Grasslands, riparian. Impacts generally minor. Can be locally important in NW CA.	CA-FP
◆	<i>Sesbania punicea</i>	red sesbania, scarlet wisteria	High	A	B	C	3.2	Riparian areas	GV
	<i>Stybum marianum</i>	blessed milkthistle	Limited	C	C	A	3.5	Grasslands, riparian. Widespread, primarily in disturbed areas. Impacts can be higher locally	NW, GV, CW, SW
	<i>Sinapis arvensis</i>	wild mustard, charlock	Limited	C	C	C	2.9	Grasslands. Primarily in disturbed sites. Impacts minor or unknown in wildlands.	CA-FP
	<i>Sisymbrium irio</i>	London rocket	Moderate	B	B	A	1.9	Scrub, grasslands. Widespread. Primarily in disturbed sites. Impacts vary locally.	GV, SW
◆	<i>Spartina alterniflora</i> (and <i>S. alterniflora</i> x <i>foliosa</i> hybrids)	smooth cordgrass & hybrids, Atlantic cordgrass	High	A	A	C	3.5	San Francisco Bay salt marshes and mudflats. Hybridizes with native <i>S. foliosa</i> .	CW
◆	<i>Spartina anglica</i>	common cordgrass	Moderate	B	B	D	3.4	San Francisco Bay salt marshes. Very severe impact in other countries. Limited distribution in CA.	CW
◆	<i>Spartina densiflora</i>	dense-flowered cordgrass	High	A	B	C	3.3	San Francisco and Humboldt Bay salt marshes	NW, CW
	<i>Spartina patens</i>	saltmeadow cordgrass	Limited	C	C	D	2.9	San Francisco Bay salt marshes. Very limited distribution. Impacts currently minor in CA, but high in other countries.	CW
	<i>Spartium junceum</i>	Spanish broom	High	A	B	B	3.2	Coastal scrub, grasslands, wetlands, oak woodland, forests	NW, CW, SW
◆	<i>Stipa capensis</i>	Mediterranean steppegrass, twisted-awned speargrass	Moderate	B	B	D	1.9	Desert scrub. First recorded in CA 1995. Limited distribution, but spreading rapidly in CA deserts.	Dson
	<i>Taeniatherum caput-medusae</i>	medusahead	High	A	A	A	3.4	Grasslands, scrub, woodland	CaR, NW, SN, GV, SW

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	<i>Tamarix aphylla</i>	athel tamarisk	Limited	C	B	B	3.5	Desert washes, riparian areas. Limited distribution. Impacts minor, but can be locally higher.	GV, SW, D
	<i>Tamarix parviflora</i>	smallflower tamarisk	High	A	A	B	3.1	Riparian areas, desert washes, coastal scrub	NW, GV, CW, Dmoj
	<i>Tamarix ramosissima</i>	saltcedar, tamarisk	High	A	A	A	3.3	Desert washes, riparian areas, seeps and springs	SN, GV, CW, SW, D, SNE
	<i>Tanacetum vulgare</i>	common tansy	Moderate	B	B	B	2.3	Riparian areas, forest. Limited distribution. Severe problem in other western states.	NW, CaR,
	<i>Torilis arvensis</i>	hedgearsley	Moderate	C	B	A	2.3	Expanding range. Appears to have only moderate ecological impacts.	CA-FP, especially CW, NW
	<i>Trifolium hirtum</i>	rose clover	Moderate	C	B	B	2.8	Grasslands, oak woodland. Widely planted in CA. Impacts relatively minor in most areas.	CA-FP
	<i>Ulex europaeus</i>	gorse	High	A	B	B	2.9	Scrub, woodland, forest, coastal grassland	NW, CaR, SN, CW
	<i>Undaria pinnatifida</i>	wakame	Limited	C	B	C	3.3	Algae of estuaries. First recorded in CA in 2000. Impacts unknown, but do not appear to be significant	CW, SW
	<i>Verbascum thapsus</i>	common mullein, woolly mullein	Limited	C	B	B	3.8	Meadows, riparian, sagebrush, pinyon-juniper woodlands. Widespread. Impacts minor.	NW, CaR, SN
	<i>Vinca major</i>	big periwinkle	Moderate	B	B	B	2.8	Riparian, oak woodlands, coastal scrub. Distribution currently limited but spreading in riparian areas. Impacts can be higher locally.	CaR, SW, SN, GV
	<i>Vulpia myuros</i>	rattail fescue	Moderate	B	B	A	3.0	Coastal sage scrub, chaparral. Widespread. Rarely forms monotypic stands, but locally problematic.	CA-FP, D
◆	<i>Washingtonia robusta</i>	Mexican fan palm	Moderate	B	B	C	2.7	Desert washes. Limited distribution but spreading in southern CA. Impacts can be higher locally.	SW
	<i>Watsonia meriana</i>	bulbil watsonia	Limited	C	B	C	2.3	Coastal prairie, coniferous forest. Abiotic impacts unknown, but may be locally dense.	NW
	<i>Zantedeschia aethiopica</i>	calla lily	Limited	C	B	C	2.1	Coastal prairie, wetlands. Impacts high in other countries and local impacts may be high in CA.	NW, CW, SW

Scientific names based on *The Jepson Manual*. For each species, the first common name is based on the Weed Science Society of America's "Composite List of Weeds" (www.wssa.net), followed by other names used in California. Scores: A = Severe, B = Moderate, C = Limited, D = None, U = Unknown. Documentation level averaged. Regions invaded based on Jepson geographic regions. Plant assessment forms, literature citations, and full rating criteria available at www.cal-ipc.org.

ATTACHMENT C

Herbicide Use within City Open Space

**Attachment C
Herbicide Use Within City Open Space**

Listed species present (or potentially present) for all maintenance activities: VP FS, VELB

Preserve and General Open Space Resource Maintenance	Goal: To control or eradicate invasive and non-native plants and trees.				
Herbicides	Active Ingredient	Application Method	Treatment	Minimization Measures	
Garlon 4 Ultra	Triclopyr, 3,5,6 Trichloro, pyridinyloxacetic, butoxyethyl	<i>Backpack sprayer with cone and low drift nozzle</i> Woody Brush: 20% solution Grassy weeds 10-20% solution <i>Hack and squirt</i> Woody Brush and Trees: 30% solution	Himalaya Blackberry, Parrot Feather, Pampas Grass, Bamboo, Cattail, Willows, Knot Weed, Fennel, Giant Reed, Chinese Tallow, Chinese Pistache, Red sesbania, Spanish Bloom, Tree-of-heaven, Black Locust, Catalpa, Tree Tobacco, Castor Bean, Eucalyptus, Tamarix, Ludwigia, Acacia, Giant Asian Dodder, Water Primrose, Water Ivy	Maintain 60' foot buffer from vernal pools and elderberry shrubs. See attached list of Minimization and Avoidance Measures numbers: For Vernal pools: #10, #11	
Aqua Master	Glyphosphate	<i>Backpack sprayer with cone and low drift nozzle</i> Aquatic: 0.5-1.5% solution Grassy Weeds: 4-8% solution <i>Sponge and Wick: 40% solution</i>	Pampas Grass, Parrot Feather, Bamboo, Cattail, Knot Weed, Arundo, Ludwigia, Water Primrose	For Valley elderberry longhorn beetle: #13, #14, #15, #16 Specific avoidance measures for herbicide use are detailed in the Invasive Plant Management Plan.	
Accord WRT	Glyphosphate, N-(phosphonomethyl) glycine	<i>Backpack sprayer with cone and low drift nozzle</i> Aquatic application: 0.75-3.75% solution Grassy weeds: 5-10% solution <i>Hack and Squirt</i> Woody Brush: 5-8% solution	Himalaya Blackberry, Parrot Feather, Pampas Grass, Bamboo, Cattail, Willows, Knot Weed, Fennel, Giant Reed, Chinese Tallow, Chinese Pistache, Red sesbania, Spanish Bloom, Tree-of-heaven, Black Locust, Catalpa, Tree Tobacco, Castor Bean, Eucalyptus, Tamarix, Ludwigia, Acacia, Giant Asian Dodder, Water Primrose, Water Ivy		
Habitat	Imazapyr	<i>Hack and Squirt</i> 1ml undiluted per cut <i>Backpack sprayer with cone and low drift nozzle</i> 0.5-5% solution	Bamboo, Cattail, Willows, Parrot Feather, Knot Weed, Fennel, Giant Reed, Chinese Tallow, Chinese Pistache, Red sesbania, Spanish Bloom, Tree-of-heaven, Black Locust, Privet, Catalpa, Tree Tobacco, Castor Bean, Eucalyptus, Tamarix, Ludwigia, Star Thistle, Giant Asian Dodder, Water Primrose, Water Ivy		

Attachment C (continued)
Herbicide Use Within City Open Space

Listed species present (or potentially present) for all maintenance activities: VP FS, VELB

Infrastructure Maintenance: Outfalls and Ditches	Goal: To control vegetation within 50ft of drainage outlets to prevent damage to storm drainage infrastructure and allow proper flows.			
<i>Herbicides</i>	<i>Active Ingredient</i>	<i>Application Method</i>	<i>Treatment</i>	<i>Minimization Measures</i>
Aqua Master	Glyphosphate	<i>Backpack sprayer with cone and low drift nozzle</i> Aquatic: 0.5-1.5% solution Grassy Weeds: 4-8% solution <i>Sponge and Wick: 40% solution</i> <i>Large tank sprayer, low drift nozzles, surfactant: 1.5% solution</i>	Grassy Weeds, Bamboo, Cattail, Willows, Parrot Feather, Knot Weed, Fennel, Giant Reed, Chinese Tallow, Chinese Pistache, Red sesbania, Spanish Bloom, Tree-of-heaven, Black Locust, Privet, Catalpa, Tree Tobacco, Castor Bean, Eucalyptus, Tamarix, Ludwigia, Star Thistle, Giant Asian Dodder, Water Primrose, Water Ivy	Maintain 60' foot buffer from vernal pools and elderberry shrubs. See attached list of Minimization and Avoidance Measures numbers: For Vernal pools: #10, #11
Reward	Diquat Dibromide	<i>Large tank sprayer, low drift nozzles, surfactant: 6.4% solution</i>	Bamboo, Cattail, Willows, Parrot Feather, Knot Weed, Fennel, Giant Reed, Chinese Tallow, Chinese Pistache, Red sesbania, Spanish Bloom, Tree-of-heaven, Black Locust, Privet, Catalpa, Tree Tobacco, Castor Bean, Eucalyptus, Tamarix, Ludwigia, Star Thistle, Giant Asian Dodder, Water Primrose, Water Ivy	For Valley elderberry longhorn beetle: #13, #14, #15, #16 Specific avoidance measures for herbicide use are detailed in the Invasive Plant Management Plan.

Attachment C (continued)
Herbicide Use Within City Open Space

Listed species present (or potentially present) for all maintenance activities: VP FS, VELB

Bike Trails/Roadways	Goal: To remove vegetation with the potential to cause public safety hazard and/or damage infrastructure.			
<i>Herbicides</i>	<i>Active Ingredient</i>	<i>Application Method</i>	<i>Treatment</i>	<i>Minimization Measures</i>
RoundUp Pro	Glyphosphate	<i>Large tank sprayer, low drift nozzles, surfactant: 2% solution</i>	Grassy weeds, woody brush	Maintain 60' foot buffer from vernal pools and elderberry shrubs.
Aqua Master	Glyphosphate	<i>Large tank sprayer, low drift nozzles, surfactant: 1.5% solution</i>	Grassy weeds, woody brush	See attached list of Minimization and Avoidance Measures numbers: For Vernal pools: #10, #11
Diuron	Diuron	<i>Large tank sprayer, low drift nozzles, surfactant: 1.5% solution</i>	Grassy weeds, woody brush	For Valley elderberry longhorn beetle: #13, #14, #15, #16
Milestone VM	Triisopropanolammonium salt of pyridine, 6 dichloro-	<i>Large tank sprayer, low drift nozzles, surfactant: 0.1% solution</i>	Grassy weeds, woody brush	Specific avoidance measures for herbicide use are detailed in the Invasive Plant Management Plan.

NOTE: All herbicide applications follow written recommendation from a Qualified Pesticide Advisor and the Herbicide Label.