Blueprint for
Coordinated Landscape-Scale Management of
Invasive Plants in California

California Interagency Noxious and Invasive Plant Committee (CINIPC)
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Purpose

Stewarding California's natural areas and working landscapes requires effective landscape-scale management of invasive plants. This document outlines key strategies and tools needed to be successful in this effort. Public and private organizations involved in the California Interagency Noxious and Invasive Plant Committee (CINIPC) will use the blueprint to coordinate efforts, to strengthen programs, to maintain shared resources, and to inform other landscape-scale conservation efforts such as Joint Ventures and the California Landscape Conservation Cooperative. Supporting this Blueprint may require agencies to develop innovative new structures for coordination and funding.

Summary of Key Points

A focus on <u>landscape-scale strategies</u> of prevention, surveillance, eradication and containment is critical. Better <u>performance measures</u> are needed to fit these strategies.

Shared decision-support tools such as the California Invasive Plant Council (Cal-IPC) <u>Inventory</u>, the <u>Calflora</u> database, <u>CalWeedMapper</u>, and <u>WHIPPET</u> should be maintained and enhanced.

Local <u>Weed Management Areas</u> should continue to form the foundation of regional coordination. <u>Cal-IPC regional prioritization</u> work should be supported.

Agencies need to coordinate to effectively address invasive plants, and it is particularly important for the <u>California Dept. of Food and Agriculture (CDFA)</u> and the <u>California Dept. of Fish and Wildlife (CDFW)</u> to prioritize programs addressing management of invasive plants at the landscape level. The structure of the <u>California Invasive Species Advisory Committee (CISAC)</u> should also be leveraged for strong interagency collaboration.

Scientific information resources are critical for decision-makers and natural resource managers, and these should continue to be available through <u>Cal-IPC</u> and the <u>UC Davis Weed Research and Information Center (Weed RIC).</u>

Landscape-Scale Management

Invasive plants—the few non-native plants in California that grow unchecked in our natural areas—cause significant ecological and economic harm. Their management is critical for protecting wildlife and ecosystem services, and is also critical to climate adaptation. As the National Strategy for Fish, Wildlife and Plant Climate Adaptation points out, addressing existing stressors like invasive species is one of the top actions we can take immediately to help wildlife adapt to a changing climate. Reducing the impact of invasive plants can enhance the ability of native species, communities or ecosystems to cope with climate change. (See www.wildlifeadaptationstrategy.gov.)

While site-specific invasive plant management will always be critical for protecting local conservation assets, landscape-level management is the only way to stop the spread of invasive plants into and across California and reduce their future economic and ecological impact. Working at the landscape level means working collaboratively across jurisdictional boundaries. Agencies, utilities and other landowners are increasingly adopting policies that recognize this need to collaboratively manage on invasive plant threats.

CINIPC, comprising state and federal agency invasive plant program managers in California (listed at the end of this document), prepared this blueprint to outline key strategies and tools needed for successful landscape-level invasive plant management in the state. Many entities in California have collaborated to build important infrastructure that serves landscape-level invasive plant management; it is vital that we maintain and, ideally, enhance this infrastructure. Much of the existing infrastructure is shared, and responsibility for maintaining it must be shared as well to ensure steady efforts. Those participating in CINIPC can refer to this blueprint as they develop programs that will integrate into larger landscape-scale management efforts.

The elements of this blueprint are in line with the state's official Strategic Framework on invasive species (see www.iscc.ca.gov), the state's Aquatic Invasive Species Management Plan (www.dfg.ca.gov/invasives/plan/), and the state's 2005 Noxious and Invasive Weeds Action Plan (www.cdfa.ca.gov/plant/ipc/noxweedinfo/pdfs/noxious_weed_plan.pdf). By coordinating landscape-level efforts, the invasive plant management community can best inform other regional efforts like Landscape Conservation Cooperatives and Joint Ventures.

Strategic Elements

To be most successful at the landscape level, management efforts must be strategically focused. It is clear that controlling species early, before they become widespread, is most effective. CDFA and UC Davis have documented eradication effectiveness and cost for infestations of different sizes, showing just how quickly costs go up and effectiveness goes down the more extensive an invasive plant infestation becomes. In short, there is more conservation "bang for the buck" (and higher economic return) when operating

early on at the beginning of the invasion process. The following strategic elements are critical.

1. **Prevention, Surveillance, Eradication and Containment** are the top strategic approaches for landscape-level invasive plant management, emphasizing action early in the invasion process.

    a. **Prevention** "best management practices" eliminate inadvertent spread of invasive plants. Cal-IPC has compiled BMPS for natural resource managers and those working on transportation and utility corridors; these should be incorporated into work practices. Also, agencies have pursued standards for "weed-free forage" that can prevent the spread of invasive plants through feed.

    b. **Surveillance** is critical for the "early detection" part of early detection and rapid response (EDRR). Active efforts looking for new infestations in areas where they are most likely to be found has the highest potential for finding new infestations when they are most eradicable. Passive surveillance based on educating those who spend time in the field can also pay EDRR dividends.

    c. **Eradication** provides long-term benefits by completely eliminating a particular invasive plant from a given area. This requires steady effort over time to make sure that all living plants as well as all viable propagules (like seeds in the soil) have been eliminated. Eradication of populations across an entire region where the species is not yet widespread can have significant ecological and economic payoff by protecting extensive areas from invasion.

    d. **Containment** is important where the spread of an invasive plant species has a clear "leading edge" such that eradication of outlier populations beyond a given containment line can keep the infestation from spreading into a new region. A good example is the coordinated effort by Sierra foothill counties to contain the eastward spread of yellow starthistle.

2. **Performance measures** are important for gauging progress. However, some existing metrics, such as "acres treated," do not fully capture the benefits of the above strategies. Alternative metrics that measure effectiveness of surveillance and progress towards eradication and containment should be created and used.

3. **Biological control agents** are the only tool that can control widespread invasive plants at the landscape-scale. The 99% reduction of the toxic rangeland plant Klamathweed in the last century is an example of a successful, cost-effective biocontrol effort. It is important that existing biocontrol development and management programs at the local, state and federal level be maintained.

Prioritization

Designing strategies of surveillance, eradication and containment requires prioritization—of species, locations and individual populations. Key species factors to be considered in landscape-level prioritization include the impact of a species, its distribution across the landscape, and its potential for spread under plausible climate change scenarios. Values at risk, such as wildlife, agriculture, recreation and infrastructure, as well as effectiveness of management tools available, can also be critical factors in deciding which landscape-scale actions are likely to be successful and yield the most benefit for the cost. Powerful prioritization tools have been developed with public agency funding to provide a foundation for program planning by California's natural resource management community as a collaborative whole. These tools should be maintained and enhanced and their use encouraged.

1. **The Cal-IPC Inventory** (www.cal-ipc.org/ip/inventory) provides a reference for which non-native species are known to be invasive in California. Cal-IPC developed a transparent criteria system that experts use in completing a Plant Assessment Form for a given species. The assessment form documents the rationale for listing a particular species. The Inventory can be used to determine whether a given plant is invasive in California, and new plants of concern can be evaluated by experts using the criteria system. Also:

   a. The **Cal-IPC Watchlist** (www.cal-ipc.org/paf) complements the Inventory by listing species of concern that may become invasive in the future. Those Watchlist species that are assessed to have the highest potential for becoming invasive in the future may be considered targets for surveillance and eradication (as they have been by the Bay Area Early Detection Network). These species can be prioritized using a screening tool like the **Plant Risk Evaluation (PRE)** being developed by UC Davis.

   b. The California Dept. of Food and Agriculture has developed an explicit risk assessment model for regulating plants through their **noxious weed list**. This will open up the process of adding invasive pants to the noxious weed list to more stakeholders and make listing transparent. The model should be actively used to ensure that all appropriate plants are listed.

   c. **California Dept. of Fish and Wildlife risk assessment capacity** should be enhanced for evaluating ecological impacts of invasive plants, since the agency's expertise and mandate focus on protecting the state's biodiversity.

2. **Calflora**, the online spatial database of wild plant observations, provides a single location for aggregating mapped populations of invasive plants (www.calflora.org). Some spatial data is sensitive and needs to remain private, but agencies and land managers will benefit by sharing their observations widely

via Calflora to the extent possible. This sharing can be accomplished by uploading single observations as they are made or by batch upload of extensive GIS datasets. Calflora is developing additional features, from smart phone apps to an online treatment-tracking module designed to serve land managers.

3. **CalWeedMapper** (http://calweedmapper.calflora.org) is an online decision-support tool that provides management recommendations for a user-selected region. The system includes statewide data on distribution, spread and management status for more than 200 invasive plant species in California. From this information, the system suggests priorities for eradication, surveillance or containment. The system also provides maps of potential future climatic range for many species, which can inform decision making. A growing number of multi-county regions have successfully used CalWeedMapper to develop priority lists, seek funding for eradication targets and assemble identification guides for EDRR surveillance targets. The USDA Forest Service, California Landscape Conservation Cooperative, CDFA, and the California Wildlife Conservation Board have sponsored development and implementation of CalWeedMapper as a weed management prioritization tool. The regional approach using CalWeedMapper should form the foundation for establishing coherent statewide strategy at the landscape scale.

4. **WHIPPET** (Weed Heuristics: Invasive Population Prioritization for Eradication Tool) is a decision-support tool that helps prioritize individual populations of invasive plants for eradication, based on species factors (such as impact and ability to spread) and spatial factors (such as relative isolation of the population from other populations of the same species). The tool also considers factors such as conservation value for particular sites and the cost of eradication. A desktop version was developed by UC Davis and CDFA and is being enhanced by the state Dept. of Water Resources. An online version is being developed by Cal-IPC with support from the USDA Forest Service and US Fish and Wildlife Service. WHIPPET should be maintained and enhanced to provide fine-grained prioritization at the population level.

Coordination

Addressing invasive plants at the landscape-scale requires collaboration between a range of entities to set priorities and to implement high-priority surveillance, eradication and containment activities. Effective collaboration requires entities who can facilitate coordination among multiple land management stakeholders. The following are key entities for coordinating invasive plant management in California.

1. **Weed Management Areas (WMAs)** have coordinated hundreds of partners at the county level since the 1990s. These county-based coordinating groups

should be supported, and regional collaborative efforts should build on these existing WMAs. Key local partners that support WMAs, like county Agricultural Commissioners and Resource Conservation Districts, should be supported.

2. **Cal-IPC** is currently leading regional coordination to develop landscape-level management strategies using CalWeedMapper. Cal-IPC should be supported in this role. Numerous multi-WMA regions are actively coordinating with Cal-IPC on landscape-level efforts. This coordination should eventually engage all regions of the state, and these regions should work together as a statewide network to coordinate efforts and share resources.

3. **CDFA and CDFW** each have particularly significant roles to play in managing the state's invasive plants, which threaten both agriculture and wildlife. CDFA has historically led statewide strategic coordination in cooperation with county Agricultural Commissioners; recent funding reductions have greatly reduced those roles. CDFW is mandated to manage the state's biological diversity. Both agencies should maintain and enhance their programs addressing invasive plants, including the key functions of prioritization, coordination, and implementation.

4. **Coordinated environmental planning** can ensure that all legal requirements are most cost-effectively integrated into project design for invasive plant management.

5. **An interagency strike team** could be organized to enhance our collective capacity to respond quickly to eradication opportunities. Funding would be directed to regional partners willing to provide on-call management personnel when and where needed.

Research, Training and Education

Implementing effective strategies for landscape-scale management requires scientifically credible information for decision-makers and natural resource managers. The following are key entities providing these services in California.

1. **UC Davis WeedRIC** provides research on the effectiveness of management techniques, the impacts of invasive plants and management, and prioritization approaches. They provide extension materials that synthesize scientific information for use by those in the field. They provide formal trainings and informal consultation. It is critical that we maintain and support the UC Davis WeedRIC.

2. **CISAC** (California Invasive Species Advisory Committee) provides a venue for agencies and a range of stakeholder groups to come together around the issue of invasive species. Among the goals of CISAC are to promote public awareness of invasive species, to support research, and to promote strong policy. These are important functions. CISAC should be maintained.

3. **NGOs** provide a range of training, conferences, and reference materials. These are important functions. NGOs such as Cal-IPC, the California Forest Pest Council, the California Weed Science Society, and the California Forest Vegetation Management Conference, provide practical training to professionals, landowners, and the public in the methods of, and need for, managing invasive plants. These NGOs should be maintained.

CINIPC

CINIPC (originally CINWCC, the California Interagency Noxious Weed Coordinating Committee) formed in 1995, with 14 agencies signing an MOU (which has since expired). Current participants include the following, who were active in drafting and reviewing this Blueprint:

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