

Strategic Approaches to Prevention



Steve Schoenig
CA Dept. of Fish and Wildlife

Why focus on Prevention When the House is already on Fire?

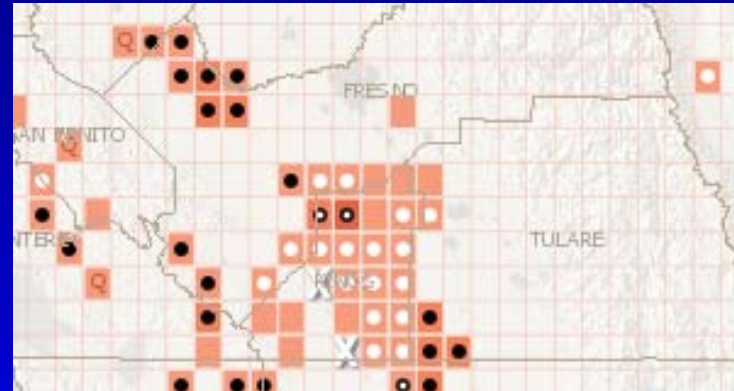
It's a good question. Here are some considerations:

- You may have a lot of bad weeds, but there are hundreds of other really, really nasty ones out there.
- The state and many county programs to fight noxious weeds have been de-funded recently and the historic safety-net is essentially no longer there.
- As with Early Detection and Rapid Response the cost of prevention measures are vastly cheaper than controlling an established infestation.

Prevention For un-infested areas

- Identify potential invaders in your region

calweedmapper.cal-ipc.org



- Assess pathways for entry of new invasive weeds



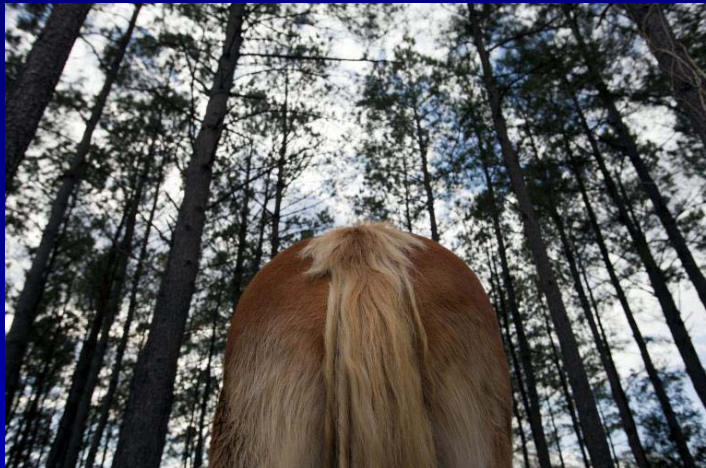
Vehicles, equipment, animals, footwear, seed, plants, materials—straw, sand, gravel, fill, roads, paths, recreation,



Propagules



Vectors



Site Conditions

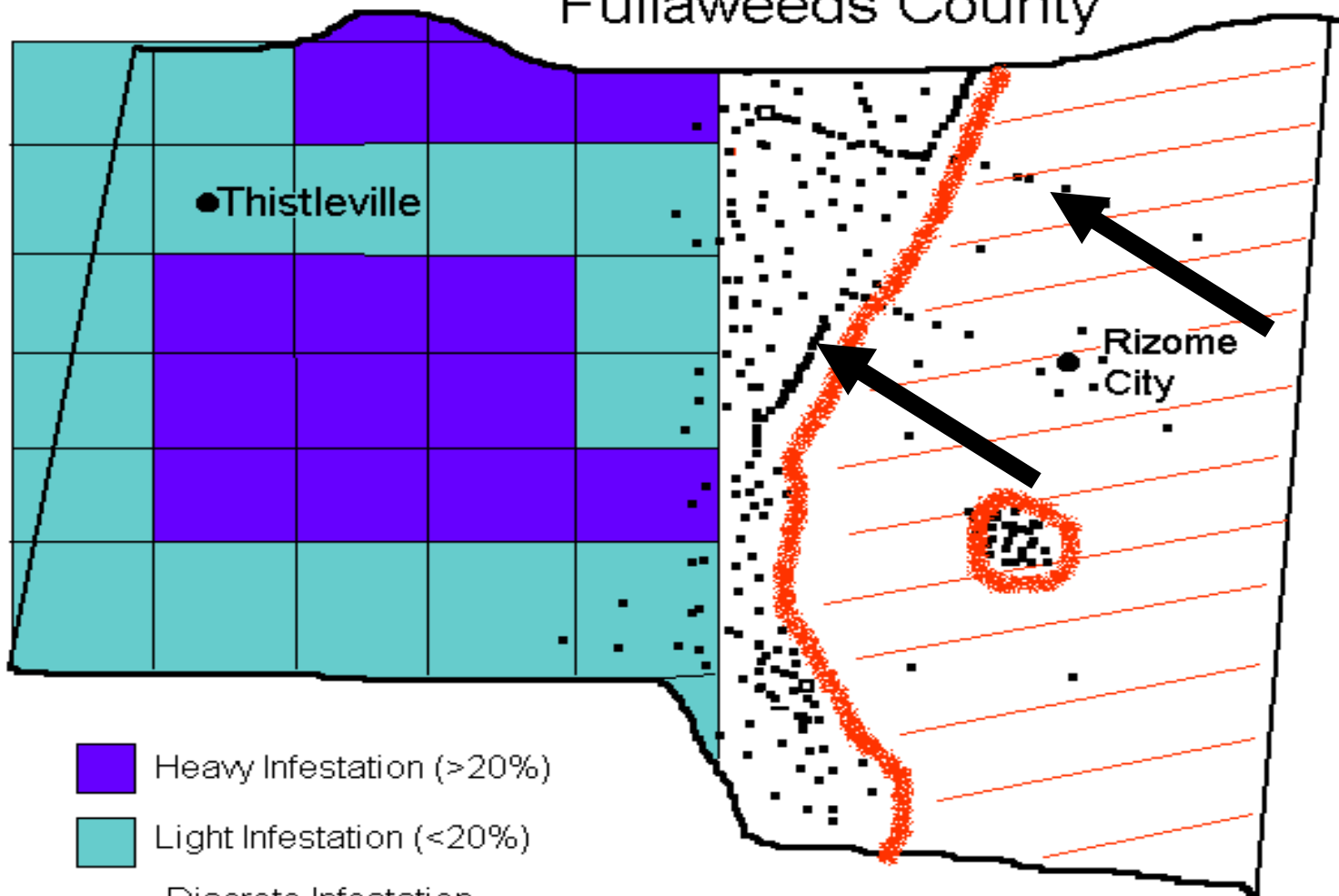


Prevention in Containment Projects

Weed Free Zones and No-spread Lines


- PREVENTING large infestations from spreading to adjacent weed-free areas
- Treating outer edges of heavy zones
- Variety of treatment methods can be used
- Long-term containment strategy can shrink the infestation or protect weed-free zones

Fullaweeds County



 Heavy Infestation (>20%)

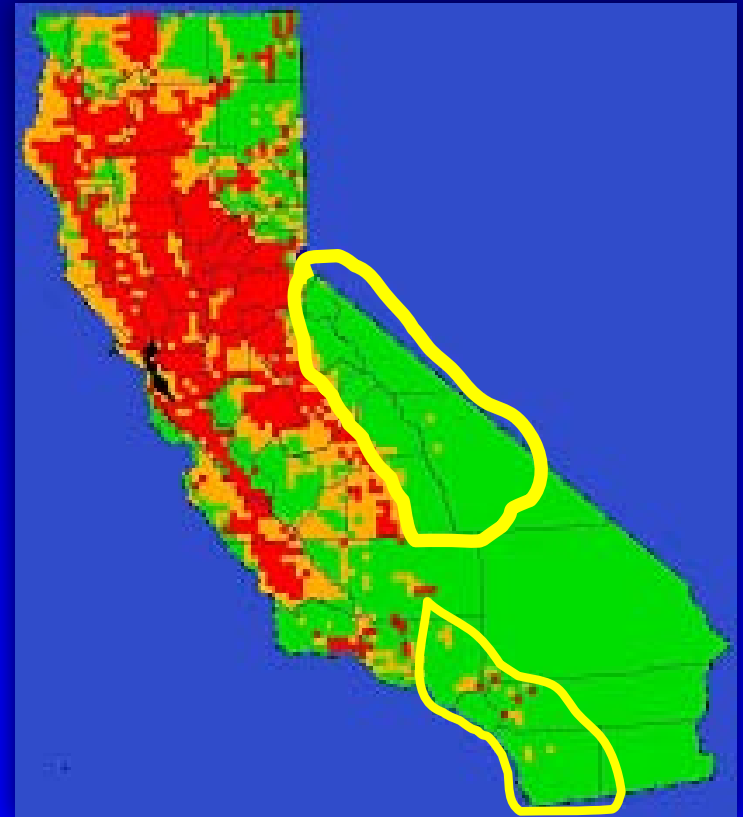
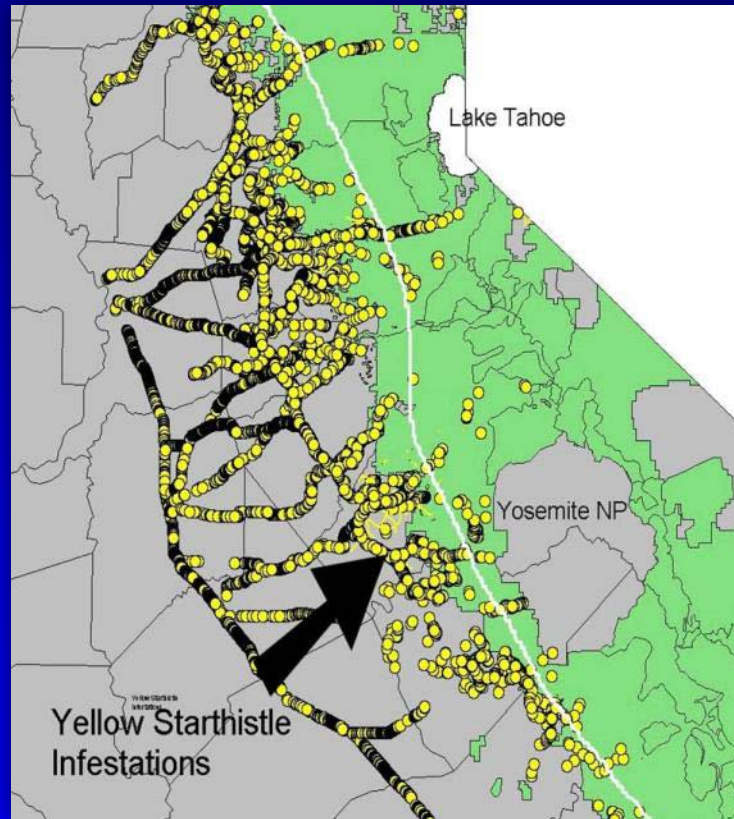
 Light Infestation (<20%)

 Discrete Infestation

 Containment Line

 Eradication Zone

Containment of Spread – The Corridor & Outlier Connection



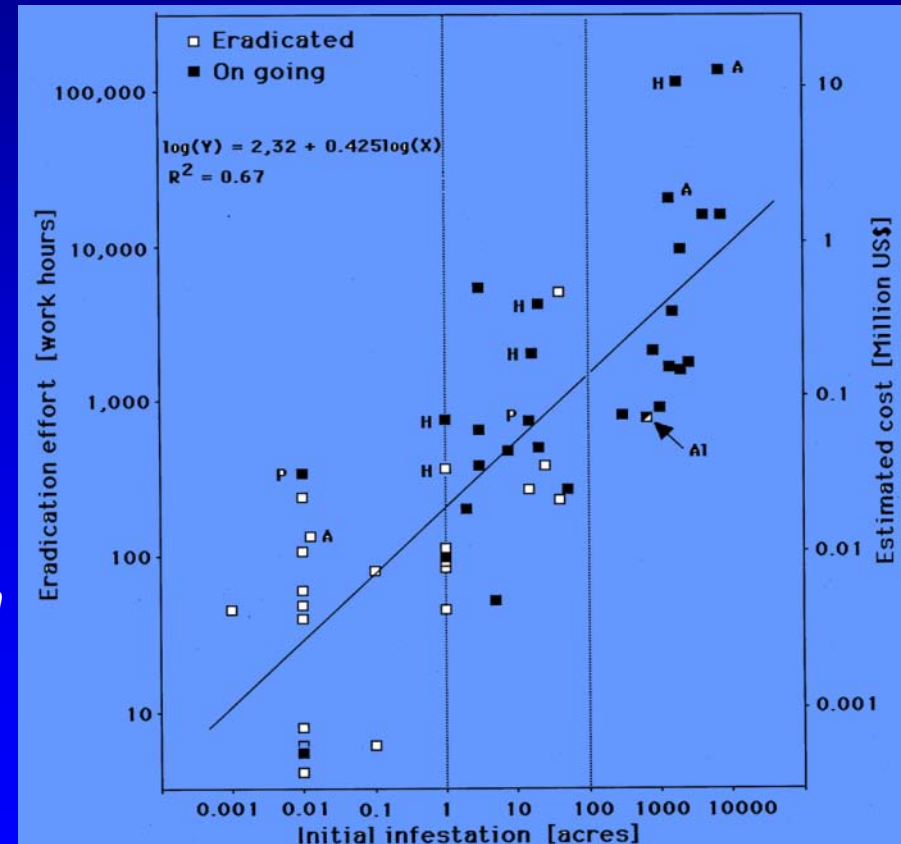
Early Detection and Eradication

When strict prevention fails

- Eliminating every individual plant from the population (eradication vs. extirpation - depends on boundaries)
- Minimum 5 years without any plants up before detection reduction
- Best suited for small-scale populations or outliers
- Requires prevention of weed survival and reproduction through very effective tools and people power. (i.e. you better be able to easily kill the plant and frequently)

Eradicated Species

- 1) Whitestem distaff thistle – *Carthamnus leucocaulos*.
- 2) Dudaim melon – *Cucumis melo var. dudaim*
- 3) Giant dodder – *Cuscuta reflexa*
- 4) Serrate spurge – *Euphorbia serrata*
- 5) Russian salttree – *Halimodendron halodendron*
- 6) Blueweed – *Helianthus ciliaris*
- 7) Tanglehead – *Heteropogon contortus*
- 8) Creeping mesquite – *Prosopis strombulifera*
- 9) Meadowsage – *Salvia virgata*
- 10) Heartleaf nightshade – *Solanum cardiophyllum*
- 11) Austrian peaweed – *Sphaerophysa salsula*
- 12) Wild marigold – *Tagetes minuta*
- 13) Syrian beancaper – *Zygophyllum fabago*
- 14) Perennial sowthistle - *Sonchus arvensis*



Effective Adoption of Prevention Strategies in your Site or Program

Working Together Against Weeds

(Christy Brigham, Sylvia Hautain, Jay Goldsmith NPS)

2009 Workshops

- Workshop goals
- Workshop format
 - One day workshop
 - introductory power points
 - scenarios and discussions
 - Small working groups focused on specific operations
 - Next steps and recommendations
 - Report to management



Cal-IPC Prevention Resources

The screenshot shows a web browser window displaying the California Invasive Plant Council (Cal-IPC) website. The browser's address bar shows www.cal-ipc.org. The website header includes the text "California Invasive Plant Council" and "Cal-IPC" with the tagline "Protecting California's wildlands through science, education, and policy". A navigation menu on the left lists various categories, with "Prevention" highlighted. A sub-menu for "Prevention" is open, listing several resources. A dashed arrow points from the "Prevention" menu item to a larger, semi-transparent box on the right that lists these resources. The website also features a "Quick Links" section, a "SPONSORS" section, and a "New at Cal-IPC.org..." section at the bottom.

File Edit View History Bookmarks Tools Help

Cal-IPC: California Invasive Pl... x +

www.cal-ipc.org Search

California Invasive Plant Council

Cal-IPC

Protecting California's wildlands through science, education, and policy

Across California, invasive plants damage wildlands. Invasive plants displace native plants and wildlife, increase wildfire and flood danger, consume valuable water, degrade recreational opportunities, and destroy productive range and timber lands. Cal-IPC works with land managers, researchers, policy makers, and concerned citizens to protect the state from invasive plants. [More...](#)

Quick Links

- Plant Profiles** - Information clearinghouse by species...
- Membership** - Individual or

Prevention

- BMPs for Land Managers
- BMPs for Transportation & Utility Corridors
- Prevention Training Videos
- Weed Free Forage
- Weed Free Aggregate

SPONSORS

POSUM!

- Conservation Experience
- ation Corps, San Diego
- Foundation/Cal. Oaks
- iversity
- Diego Open Space

BRONZE SPONSORS

- ACS HABITAT MANAGEMENT
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- Aquatic Environments
- Habitat West
- Santa Ana Watershed Association
- Southern California Edison
- US Fish & Wildlife Service
- Dow Agrosciences
- Irvine Ranch Conservancy
- Mission Resource Conservation District
- Moosa Creek Nursery
- National Park Service, Cal. Exotic Plant Management Team
- Sustainable Conservation/PlantRight Project
- Urban Corps of San Diego

New at Cal-IPC.org...

www.cal-ipc.org/ip/prevention/index.php

- Prevention
- BMPs for Land Managers
- BMPs for Transportation & Utility Corridors
- Prevention Training Videos
- Weed Free Forage
- Weed Free Aggregate

Cal-IPC Training Manuals

Preventing the Spread of Invasive Plants:

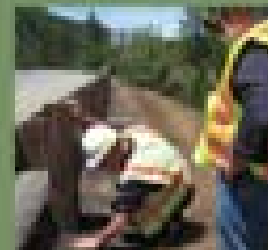


**Best Management Practices
for Land Managers**

3rd Edition

California Invasive Plant Council

Preventing the Spread of Invasive Plants:

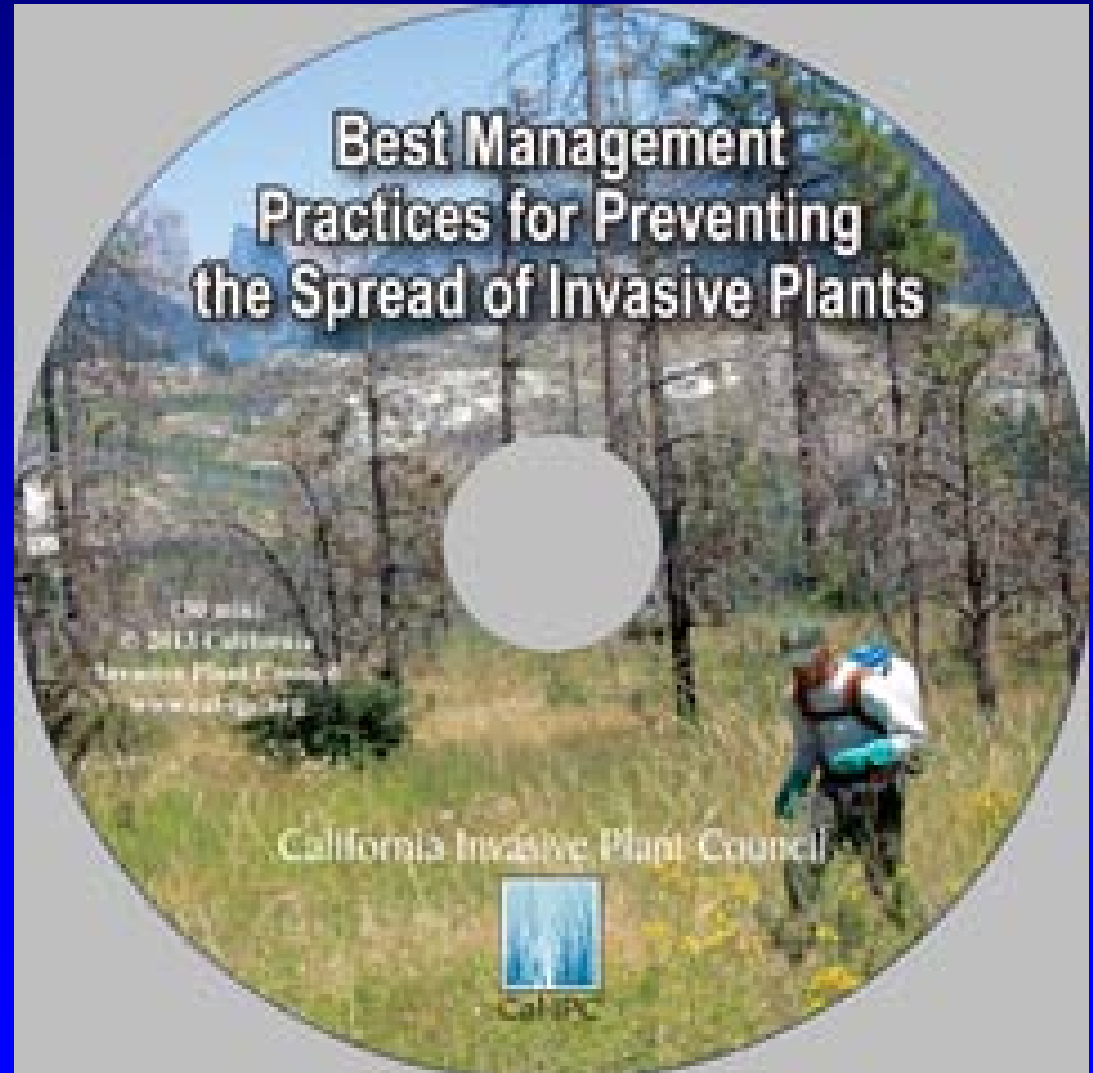


**Best Management Practices
for Transportation and
Utility Corridors**

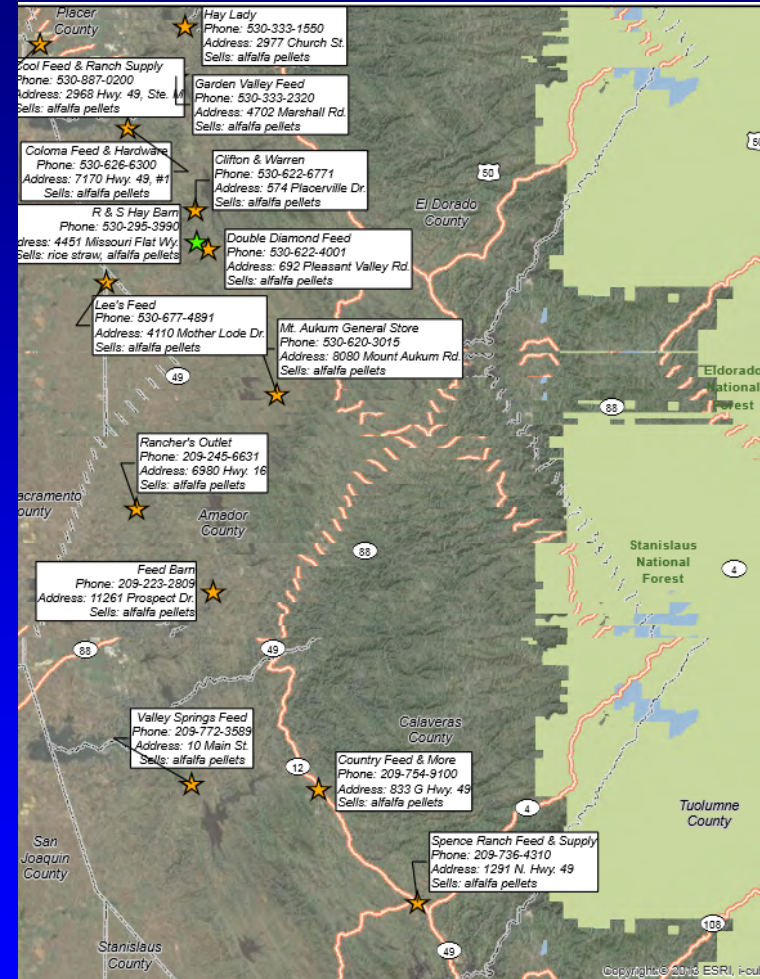
California Invasive Plant Council

Cal-IPC Training Video

Cal-IPC produced a 42-minute training video based on our Best Management Practices manuals, covering movement, disturbance, planning and awareness for land managers and utility/transportation corridor managers.



Certified Weed Free Forage and Straw Resources



Amador County Weed-Free Forage Providers 2015

LEGEND

- ★ Weed-Free Hay and Straw Provider
- ★ Weed-Free Pellet Providers
- ★ Weed-Free Hay, Straw & Pellet Provider

0 4 8 Miles

Weed-Free Aggregate Resources

Amazing 14-page online manual on getting a contract for weed-free gravel.



Don't Plant a Pest

Cal-IPC has led the charge on Don't Plant a Pest



The screenshot shows a web browser window with the address bar displaying "www.cal-ipc.org/landscaping/dpp/". The page header features a large image of a yellow thistle-like plant and the text "California Invasive Plant Council" and "Cal-IPC" with the tagline "Protecting California's wildlands through science, education, and policy".

The main content area is titled "Don't Plant a Pest!" and includes a breadcrumb trail: "Cal-IPC > Responsible Landscaping > Don't Plant a Pest > Choose a region". Below this is a section titled "Alternatives to invasive garden plants" with a paragraph of text and a "PLEASE NOTE" section. A link is provided to "Learn more about each brochure and download pdfs here.".

At the bottom, there is a section titled "Select your region using the map or the text links below:" which includes a map of California with callouts for "North Coast", "Northeast", "Tahoe Basin", and "Sierra Foothills". To the right of the map is a list of "Statewide information:" and "Regions:" with links for "Trees", "Aquatic Plants", "Bay Area", and "Central Coast".

A vertical navigation menu on the left side of the page lists the following items: Home, Invasive Plants (with sub-links for Definitions & Impacts, California Inventory, Prevention, Early Detection, Mapping, Management, and Research), Symposium, Training, Policy & Advocacy, Responsible Landscaping, WMAs & Regions, Outreach & Education, Publications & Resources, and About Us.

Don't Plant a Pest!

Give them an inch and they'll take an acre...



Scotch broom creates a serious fire hazard in the Sierra Foothills region.

INVASIVE

Suggested alternatives for invasive garden plants

Sierra Foothills Region

Gardening Responsibly – Help keep garden plants in the garden!

California is a gardener's dream. Our Mediterranean climate allows us to have fantastic gardens showcasing a wide variety of ornamental plants from all around the world. Unfortunately, some of these are serious invasive plants, threatening California's biodiversity and economy. That's because some of our plants don't stay in the garden. They "jump the fence" when seeds, roots or stem fragments spread to other areas. Because of their highly aggressive nature, invasive plants out-compete desirable plants. Once established, they change wildlife habitat, impair water resources, increase soil erosion, degrade agricultural lands, create fire hazards and reduce recreational opportunities.

English ivy (*Hedera helix*)

Photo by J. M. DeGroot

Some of these plants show woody tendencies in the garden. For example, English ivy can take over a yard and damage buildings and fences. When birds drop seeds from these trees near a stream the plants can take over, degrading natural vegetation and degrading wildlife habitat. As another example Scotch broom can quickly take over both landscaped and natural areas on your property. This plant is highly flammable and can increase the potential of wildfire.

Gardeners don't plant invasive species intentionally. Like other Californians, gardeners have a deep respect for our state's rich natural heritage. The good news is that most garden plants behave perfectly well in their intended roles. By checking state lists and resources for the problem plants, we can save ourselves and our neighbors trouble and expense while helping to protect California's landscapes from invasive plants.

Invasive plants are, by nature, a regional or local problem. A plant that jumps out of the garden in one climate and habitat type may behave perfectly in

another. The problem plants listed here have escaped from gardens throughout the Sierra foothill region. For additional plants and lists of invasive plants in other regions of the state, see the California Invasive Plant Council website at www.cal-ipc.org.

How to use this brochure:

This brochure features the most common invasive non-native pest plants that are sold in nurseries or "shared" by unknowing gardeners and suggests safe alternatives for these plants. When you are buying new plants, consider these alternatives, or ask your local nursery for other non-native plants. If any of these invasive plants are already in your yard, especially if you live near a natural area or wetland, you should remove them and replace them with a suggested alternative.

Think about why you might plant one of the problem plants in the first place. If it is for appearance, find a replacement is often easy – some of the alternatives listed here are selected especially for their similar appearance. If you need a plant to fill a functional role, such as a groundcover that grows well in a shady place, or a border plant that likes full sun, the alternatives listed here thrive in the same environments as problem plants. Both native and non-native plants have been recommended as alternatives in this brochure. Many of these alternatives are readily available; others may be easy to find in specialty or native plant nurseries.

Pay close attention to plant names when looking for non-invasive alternatives since a few of our recommended plants may have invasive relatives – even in the same genus.

Many of the characteristics that make a plant a good choice for the garden may also make it a successful invader:

- Good Garden Plants**
 - Easy to propagate
 - Establish rapidly
 - Mature early
 - Abundant flowers
 - Pest/Bease tolerant
- Invasive Plants**
 - Broad germination
 - Colonize rapidly
 - Mature early
 - Prolific seeds
 - Fast natural producers

GROUND COVERS

DO NOT PLANT! INVASIVE!



Photo by Richard O.

Periwinkle (*Vinca major*)
This aggressive grower has trailing stems that root wherever they touch the soil. Its ability to regrow from stem fragments enables periwinkle to spread rapidly in shady drainages and creeks, smothering the native plant community and reducing available wildlife habitat and forage.



Photo by Richard O.

English ivy, Algerian ivy (*Hedera helix, Hedera canariensis*)
Some ivy species in the Hedera genus are invasive. Ives can climb trees and under-story plants, causing damage by completely shading them. Shading also prevents regeneration of those trees and shrubs. Birds often spread the berries of these ivies into riparian and wetland areas. Ivy also harbors pests, such as rats and dogs, which spread them. It is difficult to remove ivies. Never dispose of ivy cuttings into natural areas.

ORNAMENTAL GRASSES AND SCREENS

DON'T PLANT! INVASIVE!



Photo by Joseph C. Williams

Crimson fountaingrass (*Pennisetum setaceum*)
Spreads aggressively via seeds by wind, water or hitch hiking on vehicles and animals. Dense infestations can crowd out native and other desirable plants.

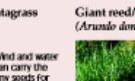


Photo by Joseph C. Williams

Pampasgrass, jubatgrass (*Cortaderia selloana, Cortaderia jubata*)
Wind and water can carry the dry seeds for miles. The massive size of each plant, with its accumulated root rhizomes, can cause erosion and displace desirable plants. Highly flammable and can burn even when green. Areas along creeks and streams are particularly vulnerable to invasion and the damage caused by these plants.

TRY PLANTING THESE INSTEAD



Photo by Joseph C. Williams



Photo by Joseph C. Williams



Photo by Joseph C. Williams

Deer grass (*Muhlenbergia rigens*)
Clumping perennial grass growing up to 5 feet tall with 2 foot plumes rising above the plant. Native Americans use it for making baskets. Other Muhlenbergia species can also be good choices.

New Zealand flax (*Phormium tenax*)
Large, hardy, fast-growing and requires minimal care. Many varieties available including striking stripes of red, yellow and green.

Bamboo – clumping varieties only (*Bambusa multiplex*)
Rhizomes of the clumping bamboo stay close to the plant, decreasing the ability to become invasive like the running bamboo varieties. Dense growth forms good hedges and screens.

California fescue (*Festuca californica*)

Blue oat grass (*Holciotrichon sempervirens*)

Flowering stalks rise up to 5 feet above large clumped grass 2-5 foot tall in late spring, early summer. Striking appearance, good edging plant, with clumps holding their shape well throughout the year.

Evergreen, bright blue-gray, narrow leaves in a fountain like clump. In spring, stems to 2 feet or taller rise above the clump, forming straw-colored flower clusters.

Also try: California milk native (*Melica californica*), Giant wild rye (*Leymus condanensis*)

SHRUBS

DO NOT PLANT! INVASIVE!

Broom – Scotch, French, Spanish (*Cytisus scoparius, Genista monespeliensis, Spartium junceum*)
Brooms have invaded over one million acres in California. The flowers produce thousands of seeds that build up in the soil over time. When the seeds germinate they create dense thickets of plants that obliterate entire plant and animal communities. Brooms also create a serious fire hazard in the Sierra Foothills region and in many areas throughout California. Note: Plants commonly known as "Sweet broom" (*Cytisus scaberrimus, Cytisus racemosus, Genista racemosa, Genista integrifolia*) are currently not known to be invasive. However, because of the lack of information on their potential for invading beyond landscaped areas, we do not recommend them as a substitute for other brooms.

Scarlet wisteria, rattletail (*Sesbania portulacastris*)
The plants form dense thickets along creeks and streams, choking out plants that provide wildlife group and habitat. Seeds are moved from garden plantings and by birds, but also by floating downstream in waterways.

TRY PLANTING THESE INSTEAD

Forsythia (*Forsythia species*)

Often the first plant to bloom in spring, Forsythia produces an astounding display of bright yellow flowers. Dozens of cultivars available. Grow quickly.

Sticky monkey flower (*Mimulus aurantiacus*)

Plants grow 1 to 3 feet tall, depending on growing conditions. Sticky green leaves, with yellow flowers blooming mid-summer to fall.

Western redbud, Eastern redbud (*Cercis occidentalis, Cercis canadensis*)

Shrub or small tree, several trunks from base, rose pink flowers in spring and interesting seed pods and foliage, which changes color throughout the seasons. Prefers well-drained soils. Western redbud is native to our region.

Strawberry tree (*Arbutus unedo*)

Dark green, handsome, red-stemmed leaves, clusters of small white, urn-shaped flowers and large clusters of red berries that can be managed as either a shrub, with screening ability if not unpruned, or a tree.

TREES

DO NOT PLANT! INVASIVE!

Chinese tallowtree (*Sapium sebiferum*)
Chinese tallowtrees are able to produce a large number of seeds and new shoots can sprout from roots. Seeds are dispersed by birds and in moving water, when they get into wetlands, creeks, rivers and native plant habitat are particularly vulnerable to invasion by this tree.

Tree-of-heaven (*Ailanthus altissima*)
Although not commonly sold in nurseries, this tree is sometimes "shared" among gardeners and spreads rapidly in its fast-growing, shade-producing habit. It produces a prolific seed producer and easily regrows from roots and stumps. Once established, the tree is very difficult to eliminate. Due to its extensive root system it is aggressive enough to cause damage to towers, roadways, sidewalks, and building foundations.

Saltcedar/Tamarisk (*Tamarix species*)
A serious riparian invader throughout California. Uses excessive amounts of water, adds salt to the soil, changes water courses, diminishes wildlife habitat, and increases fire hazard. Not commonly sold, but occasionally available.

TRY PLANTING THESE INSTEAD

Crape myrtle (*Lagerstroemia species*)

Stunning tree, great as a hot area. Showy summer flowers, good looking bark and in many cases, brilliant fall color makes them attractive year round.

European white birch (*Betula pendula*)

Upright main branches, weeping side branches with a delicate, lacy appearance. Average mature tree is 50-60 feet tall, spreading to half its height.

Mountain ash (*Sorbus aucuparia*)

Valued for showy white flowers in clusters and orange to scarlet colored fruit. Foliage is typically finely cut, glossy green and some species have good fall color.

Don't Plant or Share These Plants

These additional garden and pond plants have escaped into our local agricultural and wetlands. Although these may not be sold in local nurseries, some are available on the Internet for purchase, and others are commonly "shared" among gardeners.

Water hyacinth (*Eichhornia crassipes*)
Populations of this plant expand rapidly forming dense mats that clog waterways, alter oxygen levels, provide mosquito habitat, and displace native vegetation and habitat. Originally introduced as an aquatic ornamental.

Perennial pepperweed/Tall whitetail (*Lepidium latifolium*)
Out competes native vegetation and crops by reproducing from underground roots, forming dense weedy plots. The dried flowers have been used as decoration but growing the plant is not worth the risk!

Himalaya blackberry (*Rubus armeniacus* – *R. discolor*, *R. procerus*)
Sprawling perennial vine or shrub that may expand 10 or more feet per year, smothering other plants. Identified easily by its leaflets grouped together to form each leaf.

Purple loosestrife (*Lythrum salicaria*)
Commonly grown near wet areas. Resists year to year from root buds and from the root crown. Erect stems, 2 to 4 feet tall, produce purple flowers on spikes. Although not commonly sold locally, this plant is available for purchase on the internet.

Oblong sedge (*Euphorbia oblongata*)
The plants form extensive creeping root systems, making the plant highly invasive. The whitey sap is toxic to humans, horses and cattle.

Dalmatian toadflax (*Linaria gentianifolia subspecies almatika*)
Reproduces by seed and from creeping roots. This plant, also known as "wild snapdragon" has been used as an ornamental but the invasive nature makes it a poor garden companion.

Foxglove (*Digitalis purpurea*)
Foxglove has escaped cultivation to thrive in open and moist sites along roads and in forest areas in the Sierra Nevada Foothill region. These plants produce abundant seed that have been reported to survive in the soil for up to 88 years!

Based on a brochure by the California Invasive Plant Council www.cal-ipc.org



Content developed and funding provided by: California Native Plant Society – El Dorado Chapter P.O. Box 1948, Placerville, CA 95667 www.cnps.org

Divide Garden Club P.O. Box 478, Georgetown, CA 95634

El Dorado County Invasive Weeds Management Group (530) 621-5555 or (530) 621-5520

University of California Cooperative Extension Natural Resources Program <http://cecenter.ucdavis.edu> (530) 621-5502

UCEC Master Gardeners – El Dorado County <http://extension.ucdavis.edu/> Master's/Gardener (530) 621-5512

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- ▶ [Invasive Plants & Alternatives](#)

- ▶ [PlantRight's Projects](#)

- ▶ [How to Help](#)

- ▶ [Resources](#)

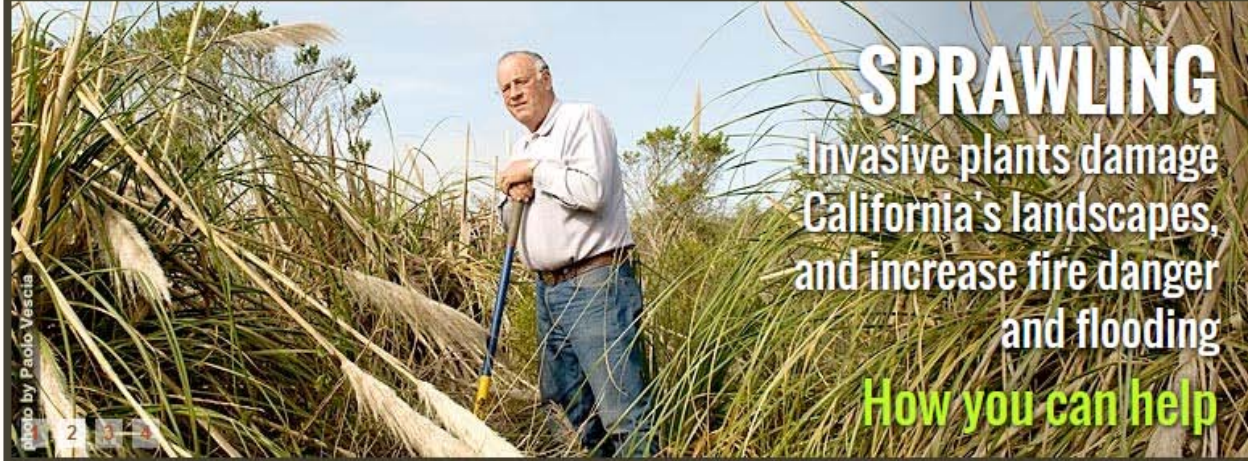
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Invasives Where You Live	Retail Nursery Partners	Invasives 101
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Which plants are invasive in your area of California?
Find out here

California Retail Nurseries:
Join us today!

Or, [find a PlantRight Partner](#) near you

Get the facts on invasive plants
Continuing Education
 Impacts | Research | Spread the word

Cal-IPC Offered an awesome class!

Preventing the Introduction and Spread of Invasive Weeds Workshop

Opening Remarks and Introduction

- Wendy West, University of California Cooperative Extension (3 mins.)

What is the Issue? Invasive Plant Biology and Vectors of Spread

- Sue Donaldson, University of Nevada Cooperative Extension (27 mins.)

Controlling Invasive Weeds through an Aggregate Quarry Inspection Program

- Garrett Dickman, Yosemite National Park (30 mins.)

Weed Control, Mine Reclamation, and the Surface Mining and Reclamation Act

- Leah Gardner, Office of Mine Reclamation, CA Dept. of Conservation (16 mins.)

USFS Lake Tahoe Basin Management Unit Aggregate Inspection Program

- Rena Escobedo, LTBMU, US Forest Service (18 mins.)

Best Management Practices for Work in Utility & Transportation Corridors

- Wendy West, University of California Cooperative Extension (19 mins.)

Stop the Spread of YST into the Sierra Nevada Mountains Project

- Wendy West, University of California Cooperative Extension (34 mins.)

Invasive Species Information

General Information

Impacts

Management

Planning and Prioritizing
Threats

Inventory and Survey

Monitoring

Ecologically-based IPM

Control Methods

Prevention

Restoration and
Revegetation

Troublesome Invaders

Fact Sheets

News and Media

Invasive Plant Management: Prevention

The most effective, economical, and ecologically sound approach to managing invasive plants is to prevent them from invading in the first place. Land managers often concentrate on fighting well-established infestations, at which point management is expensive and eradication is unlikely. Infestations must be managed to limit the spread of invasive plants, but weed management that controls existing infestations while focusing on prevention and early detection of new invasions can be far more cost-effective.

Invasive plant prevention depends on:

- Limiting the introduction of invasive plant seeds
- Early detection and eradication of small patches of invasive plants
- Minimizing the disturbance of desirable plants along trails, roads, and waterways
- Maintaining desired plant communities through good management
- Monitoring high-risk areas such as transportation corridors and bare ground
- Revegetating disturbed sites with desired plants
- Evaluating the effectiveness of prevention efforts and adapting plans for the following year.

EDRR

Prevention

Websites

[California Invasive Plant Council: Prevention](#)

[Don't Move Firewood](#)

[Prevention Training Videos](#)

[Weed Prevention Areas: Protecting Montana from Invasive Weeds](#)

[Weed Prevention and Management Guidelines for Public Lands](#)

Articles and Publications

[Preventing the Spread of Invasive Plants: Best Management Practices for Land Managers](#)

California Invasive Plant Council | 2012

[Preventing the Spread of Invasive Plants: Best Management Practices for Transportation and Utility Corridors](#)

California Invasive Plant Council | 2012

[Inspection and Cleaning Manual for Equipment and Vehicles to Prevent the Spread of Invasive Species](#)

USDI Bureau of Reclamation | 2012

There are
many
other
resources
out there
on the
web

www.weedcenter.org/management/prevention.html



