Invasive Plant Control at California State Parks in the Northern Sacramento Valley

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A mission of the California Department of Parks and Recreation is to preserve the state's extraordinary biological diversity by protecting, maintaining, and restoring native species and natural communities. Invasive exotic plants pose the single greatest natural resource threat facing California State Parks, because they can spread rapidly and out-compete native species, change the landscape, destroy habitat, and upset natural ecosystem processes.

Management of exotic species is designed to avoid damage to natives and their natural communities and processes, park cultural resources, and human health and safety. It is State Park policy to minimize the need for pest control, and when control is necessary, an adaptive integrated pest management approach is taken to reduce pesticide use, and only least toxic, target specific chemicals are used.

Mechanical control methods are generally preferred where effective. Jim Dempsey uses a Weed Wrench to remove a northern Catalpa (*Catalpa speciosa*) sapling.

Larger invasive trees are left standing as snag habitat after treatment where they pose no fall hazard. Here, a treated invasive mulberry (*Morus alba*) snag stands behind a planted California sycamore (*Platanus racemosa*, foreground).

Chemical control methods are designed to minimize herbicide use and target chemical for direct absorption…

…'drill-inject' method used on walnut (*Juglans hindsii* x.) by John Heredia …

…'peel-and-spray' method used on tree of heaven (*Ailanthus altissima*)…

…edible fig (*Ficus carica*) is basal sprayed.

Control of larger stands of invasive plants can itself create the kind of landscape disturbance that provided opportunity for weed Invasion in the first place, so planting and establishment of native plants appropriate to the site are sometimes necessary to prevent reinvasion and to complete restoration of the native habitat.

Volunteers are essential to our habitat restoration projects. In collecting Valley oak (*Quercus lobata*) acorns our Boy Scout Troop contested the largest, longest, and heaviest acorns – the winners are shown below at left. Let me know if you can find any larger !

Volunteers plant Valley oak acorns, December.

Target Invasives In State Parks of the Northern Sacramento Valley

		Park Unit presence / control priority (high control priority; medium priority; low priority)							our control method preference					
		Ide Adobe SHP	Woodson Bridge SRA	Bidwell-Sacramento River SP	Bidwell Mansion SHP	Lake Oroville SRA	Colusa - Sacramento River SRA	unnamed State Park (at Sutter Buttes)	biocontrol	Weed Wrench (or mechanical)	'peel-and-spray' (basal spray) or 'hack-and-squirt'	cut stump	foliar spray	
woody species														
Ailanthus altissima (A-2)	tree of heaven				(removed)						1	2		resprouts
Albizia julibrissin	silk tree			(removed)						1	2	3		
Catalpa speciosa	northern Catalpa									1	2	3		
Celtis occidentalis	eastern hackberry				(removed)					1	2	3		
Cytisus or Genista (A-1)	Scotch or French broom									1		2		
Diospyros kaki	persimmon					(removed)				1	2	3		
Eucalyptus globulus (A-1)	blue gum									1	2	3		
Ficus carica (A-2)	edible fig				(removed)			historic non-inv			1	2		resprouts
*Juglans **	walnut							historic non-inv		1	2	3		
Maclura pomifera	osage orange									1	2	3		
Morus alba	white mulberry									1	2	3		
Nicotiana glauca	tree tobacco									1	2	3		
Olea europaea (b)	olive									1	2	3		
Pistacia chinensis	chinese pistache									1	2	3		
Platanus x acerifolia	London plane tree									1	2	3		
Prunus cerasifera	cherry plum				(removed)					1	2	3		
Prunus dulcis	almond				(removed)					1	2	3		
Pyracantha angustifolia	Chinese firethorn									1	2	3		
Robinia pseudoacacia (b)	black locust									1	2	3		
Sesbania punicea (RA)	scarlet wisteria									1				
Tamarix (A-1)	salt cedar									1	2	3		
Ulmus pumila	siberian elm									1	2	3		
non-woody species of note														
Arum italicum	italian arum													{… your suggestion …}
Arundo donax (A-1)	giant reed				(removed)								2	1
Cardaria (A-2, B)	hoary cress													"foliar"
Carduus pycnocephalus (b)	Italian thistle							pig disturb's		{… your suggestion …}				
Centaurea solstitialis (A-1, C)	Yellow starthistle								insects	bud mow				"Transline"
Chondrilla juncea (A)	skeletonweed													"Transline"
Cortaderia selloana (A-1)	pampas grass					(removed)								yes
Hedera (b)	English/Algerian ivy				(removed)					1				2
Lepidium latifolium (A-1, B)	perennial pepperweed													"foliar"
Lythrum salicaria (RA)	purple loosestrife								beetles					yes
Phytolacca americana	pokeweed									bloom hoe				late spring
Rubus armeniacus (A-1)	Himalay. blackberry				(removed)				(rust?)					yes
Vinca major (b)	periwinkle				(removed)									mid-spring

* *Juglans hindsii*, Northern California black walnut is not native in the Sacramento River watershed above the American River.

(A-1) Cal IPC 1999 Weed List A-1, Most Invasive Wildland Pest Plants documented as aggressive invaders that displace natives and disrupt natural habitats; Widespread.

(A-2) Cal IPC 1999 Weed List A-2, Most Invasive Wildland Pest Plants documented as aggressive invaders that displace natives and disrupt natural habitats; Regional.

(b) Cal IPC 1999 Weed List B, Wildland Pest Plants of Lesser Invasiveness; invasive pest plants that spread less rapidly and cause a lesser degree of habitat disruption; may be widespread or regional.

(RA) Red Alert: Pest plants with potential to spread explosively; infestations currently small or localized. If found, alert Cal-IPC, County Agricultural Commissioner, or California Department of Food and Ag.

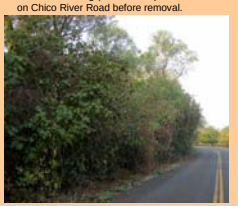
(A) CDFA A-rated noxious weed; eradication, containment, rejection, or other holding action at the state-county level. Quarantine interceptions to be rejected or treated at any point in the state.

(B) CDFA B-rated noxious weed, includes species more widespread, therefore more difficult to contain; agency allows county Agricultural Commissioners to decide if local eradication or containment is warranted.

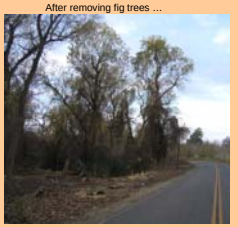
(C) CDFA C-rated noxious weed, includes weeds that are so widespread that the agency does not endorse state or county-funded eradication or containment efforts except in nurseries or seed lots.

Oak seedlings are protected with tree tubes as they emerge in late spring.

Invasive edible fig (*Ficus carica*) encroaches on Chico River Road before removal.



After removing fig trees …



.. the area is planted with natives …

… and gets flooded by the Sacramento River.

Restoration of a hillside seep infested with Himalayan blackberry and fig:

'hack-and-squirt' = use a shingle hatchet to hack into the wood (target xylem), 1 hack per 2" diameter at breast height (= 1 cut every 6" circumference), then quickly squirt into the opening 1-3 mL of xylem-mobile herbicide (50% 'RazorPro' glyphosate and/or 6% 'Stalker' imazapyr in water), May-July, conditions permitting.

'drill - inject' = similar application to 'hack-and-squirt', I use this method because my bad shoulder limits hatchet use. Use a compact cordless drill with 1/4" Brad-point bit to drill 1 hole every 3-6" circumference; quickly inject 1-2 mL of xylem-mobile herbicide mix (as above) using a calibrated 'drench gun' drawing from a backpack reservoir.

'peel-and-spray' = basal spray thin-barked trees (generally under 3" diameter); for trees with thicker bark, cut and peel the outer bark low on the trunk to expose the inner bark (target phloem), 1 peel per 2" diameter (=1 cut every 6" circumference), then spray without runoff a penetrating phloem-mobile herbicide mix (20% 'Garlon-4' and/or 6% 'Stalker' imazapyr in basal oil), August-November, conditions permitting.

Monitoring is important to catch an invasion early and remove it before it gets out of hand. Here, Ed Larsen pulls 'Red Alert' scarlet wisteria (*Sesbania punicea*) from the Lake Oroville Forebay shoreline while it is still easy to control.

Pigs introduced to the Sutter Buttes create extensive areas of disturbed soil in their search for acorns and roots. These disturbances are opportunities for an epidemic invasion of Italian thistle (*Carduus pycnocephalus*).