



Invasive Plant Management on The Santa Lucia Preserve: A Landowner's Guide

Updated January 2019

Invasive weeds are on the march throughout California, jeopardizing the beauty and biodiversity of the land, damaging streams and watersheds, and increasing the risk of uncontrolled wildfire. Here on The Preserve, the Santa Lucia Conservancy, Santa Lucia Preserve Community Service District, the Ranch and Golf Clubs, and Preserve landowners and neighbors are teaming up on weed abatement activities, and we could use your help. In particular, you can support this effort by taking action against four top priority weed species that are increasing fire fuels and posing a threat to our native plants and animals.

The care shown by Preserve owners and landscaper contractors in implementing the Prohibited Plant List has been remarkably effective for avoiding impacts seen on neighboring properties. However, some of the most aggressive weeds are still finding their way into our Homelands, Openlands and Wildlands. This guide outlines how to identify our top weeds of concern, their threats to The Preserve, and Conservancy-approved invasive weed treatments for Homelands and Openlands. When working in the Openlands, following these guidelines is necessary to protect people, sensitive habitat and wildlife. Conservancy staff are always available to assist in assessing and addressing your weed challenges. These are the four 'weeds types' of particular concern on The Preserve at this time:



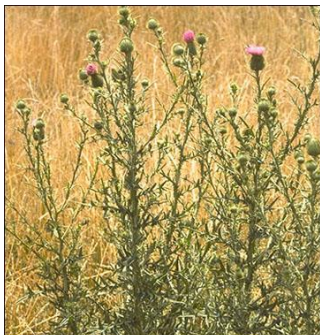
Preserve Member Rich Griffith and the streamside meadow he is reclaiming from broom and hemlock. Spring 2017



1. 'French Broom' *Genista monspessulana*



2. 'Poison Hemlock' *Conium maculata*



Effective control of these weeds requires persistent management. Experts at seed dispersal, invasive plants often ‘return’ after initial treatments due to a reservoir of seeds in the topsoil (called a seedbank). Our best approach for achieving long-term control of these weeds is two-fold:

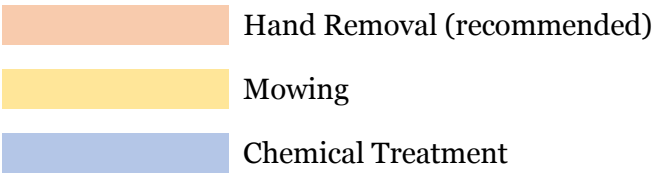
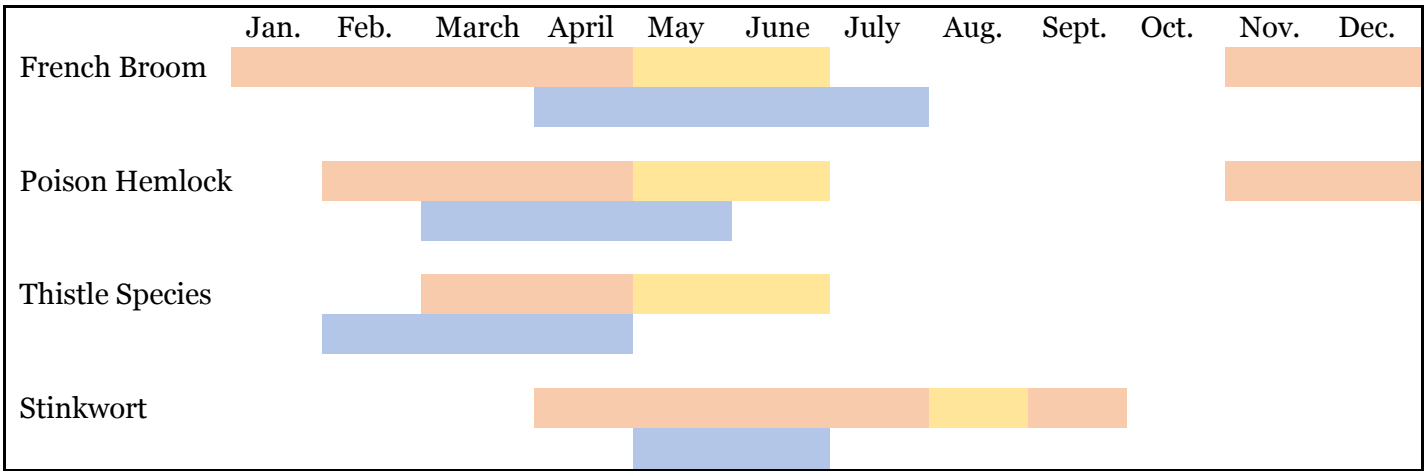
1. Deplete the seedbank by removing plants each year before flowers mature, and continue to do so for several years until we have diminished the seedbank in the soil.
2. Manage for a desired condition: have a plan for what will replace the weeds and actively promote those species. The Conservancy can help you design and implement a simple restoration plan.

THE GOOD NEWS: most weed species respond significantly after 2-3 seasons of consistent, timely control, reducing the effort required in future years to monitoring and managing new seedlings.

Where removal activities have left patches of bare dirt larger than a square foot (around the size of a dinner plate), seeding of native grasses may be appropriate. Please consult Conservancy staff to determine the best options to use on your property. Appropriately sourcing seed mixes can avoid the risk in introducing new, potentially worse weeds to The Preserve.

Please take a few minutes to observe whether these plants are present in your Homelands or Openlands. If present, we strongly encourage you to remove these plants at your earliest convenience. Your landscaping contractor or Resident Services can assist you, using the methods below.

Invasive Weed Management Time Table – Optimal Treatment Periods



Chemical treatment of invasive plants is permitted in the Homelands. Please consult with the Conservancy prior to use in the Openlands to protect community health and sensitive resources.

1. French Broom (*Genista monspessulana*) is a perennial woody shrub from the Mediterranean that is invading grasslands, chaparral, woodlands, and riparian areas throughout California. Plants can grow a foot or more per year and reach a height of 5-15 feet. The shrub can be identified from the small soft leaves which grow in sets of 3 leaflets. Bright yellow flowers blossom from January-September. Once pollinated, the flowers form ‘pea pods’ from May through late summer. These pods then pop during the

driest time of year, producing huge sets of seeds. A single bush can produce thousands of seeds, enabling it to overwhelm native vegetation in a wide variety of conditions. French broom changes native soil conditions by altering nitrogen levels, enhancing its own population. Stands of French broom increase fire risk by creating continuous and often dense ladder fuel which can increase the rate of spread and intensity of wildfire.



'French Broom' Genista monspessulana



Treatment: Although these shrubs grow quickly, their roots develop slowly and remain shallow in the soil. Plants can be pulled by hand or with the use of a 'weed wrench' during the rainy season from November - April. This timing is optimal for removing plants before they form or set seed. Manual removal also has the benefit of flushing the otherwise long-lived seed bank, provided additional control is conducted in following years. Once mature plants are removed, the next generation of young plants will not produce flowers or seeds in their first 2-3 years. The small plants in their second generation can then be easily pulled and in doing so, reduce the populations by as much as 70-80%, making them much more manageable. Conducting manual 'weed patch' management every other year for five years with annual follow-up monitoring and maintenance thereafter is the most effective means to achieve long term eradication. *Weed wrenches are available by loan through the Santa Lucia Conservancy.*

Herbicide treatment to control French Broom may impact non-target species. Use of foliar spray is recommended for dense stands of French Broom where there will be little impact on non-target species using triclopyr (Garlon). Spray leaves until wet but not dripping. In areas where French Broom is mixed in dense stands of coastal scrub, use of a cut stump treatment or basal bark treatments are preferred. French Broom treated with herbicides must be removed after they have been killed to reduce fire risk. (See table on page 11 below for herbicide rates for each treatment)

Note: Although mowing broom plants can lower fuels and reduce seed production in the short term, plants often re-sprout even after repeated mowing, making them harder to control in the long term. In this case, herbicides may be required to kill previously mowed plants with extensive root systems. *Please note: herbicide use in the Openlands requires coordination with the Conservancy.*

Please be sure to avoid damage to these Native Look-a-Likes:

Yellow Bush Lupine (*Lupinus arboreus*): This is the largest of our native lupines and the only lupine with yellow flowers on the Preserve. Compared to French broom, the flowers tend to grow in more compact columns and the leaves are composed of 5-7 leaflets rather than 3. Like French Broom, they have 'pea-pod' seed structures that can look very similar.

Deerweed (*Acmispon glaber*): Although this California native also bears leaves of three, they are much smaller and thinner than French broom. The plant is also shorter and more compact with smaller flowers that eventually fade to red as they mature.



Mature 'Bush Lupine' *L. arboreus*



'Bush Lupine' *L. arboreus* flower



Mature 'Deerweed' *A. glaber*



'Deerweed' *A. glaber* flower

2. Poison Hemlock (*Conium maculatum*) is an herbaceous biennial plant from Eurasia. It responds vigorously to disturbed earth, and tends to thrive in wet, open areas. The leaves have a lacy, fern-like appearance. Purple spots and streaks occur along the hollow stalk, which ranges in height from 2 to 10 feet tall. In the winter, early growth of hemlock is easily noticeable from the bright green color of early growth. In the spring, the feathery foliage begins to bolt, producing white compound flowers which form seeds in early to mid-summer. Plants dry into tall stiff dead stalks in late summer and fall, increasing fire risk. The vegetation is toxic to people and animals if consumed.



'Poison hemlock' *Conium maculatum*

Treatment: Poison hemlock plants do not regenerate if hand-pulled: their shallow roots can be easily pulled as young plants in the spring or once the ground softens in the fall. Wearing gloves and washing up after handling these toxic plants is encouraged. Remove plants before they produce seed every year to reduce the seedbank. There are several plants with a similar appearance, so it is helpful to look for purple streaks on the stems or contact the Conservancy if you are unsure. If the impacted area is too large to manage by hand, hemlock stands can be mowed in their second year during the late spring to early

summer when the flowers are in bloom. Mowed plants may resprout, especially if fog and late rain occurs following the mow.

Herbicide treatment for poison hemlock can be effective when applied early to seedlings or small rosettes, but not mature plants. Treat with either Imazapry (Habitat) or Triclopyr (Garlon 4 Ultra) in the spring when the plant is actively growing before it bolts. Spot spray the plants until foliage is wet, but not dripping. Effective eradication requires follow-up monitoring and management of poison hemlock for several years until the seedbank is depleted. Reseeding the treated area following herbicide application may improve long term control of this invasive. *Please consult the Conservancy about appropriate native seeds to use on your property.* (See table on page 11 below for herbicide rates for each treatment)

Native Look-a-Likes:



‘Cow Parsnip’ *Heracleum maximum* plant and flower leaves and plant



‘Yampah’ *Perideridia* sp.



Cow Parsnip (*Heracleum maximum*): This large native is closely related to the invasive non-native Hemlock. It is also an annual plant but it has both bigger thicker leaves and larger umbrella blooms. It thrives in shaded wet areas and is rarely found in dry areas with full sun.

Yampah (*Perideridia* spp.): These natives are in the carrot family, with one local species—Gairdner’s Yampah—designated as a rare plant. Yampahs are perennial and grow up to 5 feet tall on slender stalks. Though a yampah flower may resemble that of poison hemlock, yampah leaves occur only at the base of the plant whereas hemlock leaves occur up the entire stalk.

3. Invasive Thistles: There are several species of non-native thistles that are of concern in this area. Thistles thrive in areas that have been disturbed or exposed to fire. In areas where native vegetation is healthy, thistles are less inclined to invade. On The Preserve, Italian thistle tends to sprout along roads, trails, and in construction areas. Generally, the first to bloom and the most prolific of the Preserve’s invasive thistles, its control is challenging. Milkthistle generally follows in mid-spring and then bull thistle and yellow starthistle towards the end of spring into early summer.

Seeds are wind dispersed and can travel great distances, making control especially challenging. Preventing seed dispersal is the most effective means of control, so proper timing is essential.

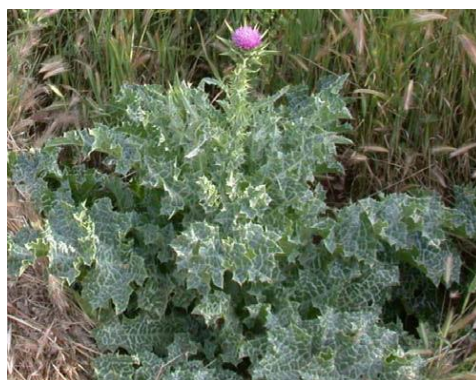
Italian Thistle (*Carduus spp.*): Italian thistle often forms large dense stands. Mature Italian thistle plants have branching stems near the top, supporting clusters of 2-5 small pink to purple flower heads.



'Italian Thistle' *Carduus spp.*



Milkthistle (*Silybum marianum*): These may be the easiest to identify of the invasive thistles from the white veins on the thick spined fleshy, ruffled leaves. The size of milkthistle plants can vary greatly depending on soil moisture. Milkthistle starts blooming in mid spring and produces large stalks and bright pink flowers with large spines.



'Milk Thistle' *Silybum marianum*



Bull Thistle (*Cirsium vulgare*): This is the largest of our invasive thistles growing up to 6 ½ feet tall. It has deep green foliage with large blossoms and spines. It is important to properly identify because it shares the most similar features to our native thistles. Distinguish bull thistle from natives by identifying the stiff, bristle like hairs on their foliage giving a sandpaper like feel. The shade of green is also a distinguishing feature compared to the more silver look of natives.



'Bull thistle' *Cirsium vulgare*



Yellow Starthistle (*Centaurea solstitialis*): Through vigorous monitoring and rapid response, yellow star thistle is largely controlled on The Preserve. However, new seeds can come in on construction equipment and other sources, so vigilance is required. This thistle is considered a 'zero tolerance' weed by the Conservancy; if you detect yellow starthistle anywhere on The Preserve, contact us immediately with specific information on its location. Yellow starthistle is poisonous for horses and can be fatal. Yellow starthistle has grey-green to blue-green foliage covered in fine cottony hairs, forms dense patches, and has a deep taproot. The flower is bright yellow with sharp spines around the base.



'Star thistle' *Centaurea solstitialis*



Treatment: Thistle begins growth with low clusters of leaves that can be effectively dug or pulled in early spring. Healthy native vegetation competes well, so consider seeding with native grasses if hand-pulling thistle. The Conservancy can assist with identifying appropriate seeds and sources.

Once plants produce stalks with flowers, they should be mowed immediately to prevent flowers from maturing and forming seeds. Thistle stands may require multiple mows in a single season as plants mature during the rainy season. Even mowed plants can quickly re-sprout if followed by rain or fog and must be promptly re-treated. Milk thistle and Bull thistle can be more effectively eradicated through a single mowing prior to setting seed.

Herbicide treatment for thistles is effective at the rosette stage from February to April. Recommended chemicals are Aminopyralid (Milestone) and Clopyralid (Transline) and are effective on all targeted thistles for weed management. Milestone can be applied up to the edge of water bodies, Transline requires a buffer zone of at least 25 feet from water bodies. Spray the rosettes until wet but not over saturated so that the chemical runs off the plant. Herbicide treatment of thistles should continue for at least three years. (See table on page 11 below for herbicide rates for each treatment)

Please be sure to avoid damage to this Native Look-a-Like: The Preserve is also home to a native thistle species. It typically grows as a solitary plant or in small stands. These thistles can be safely retained, as they support native pollinators and do not become invasive.

Cobweb Thistle (*Cirsium occidentalis* spp.): Native cobweb thistles are most easily identified by the spindles of webbing found on the flower head beneath the bloom. They generally have a silver tinge and rarely grow in large stands.



'Cobweb thistle' *Cirsium occidentale* spp.

4. Stinkwort (*Dittrichia graveolens*) Stinkwort is a relatively new California invader causing great concern in the region. An annual woody shrublike weed, it has a conical shape about 3 feet tall when mature. Proliferating in disturbed areas, stinkwort is often first noted in construction sites, and thrives along roads and trails. Leaves are long and slender, up to 1 inch long and 1/4 inch wide. Small yellow flowers usually show in fall and winter, and become more red in color as the plant matures. The seeds are small and distributed by wind, water, or sticking to equipment, clothing and fur. This highly aromatic plant has sticky, hairy, oily foliage which makes control with herbicide difficult. Use caution when managing this weed as it can cause skin rashes in humans. The Conservancy will assist with removal – please notify us immediately if you see it.



'Stinkwort' *Dittrichia graveolens*



Treatment: Managing stinkwort requires aggressively preventing seed production for 1-2 years to reduce the seedbank and inhibit population growth. This may require monitoring the plants and treating them multiple times in the first season. Hand removal of stinkwort is the most common and effective method for eradication. Using gloves, pull stinkwort as soon as it emerges in the spring through early fall (April – September). Stinkwort has a shallow root system and can be easily pulled from the ground. It is best to remove stinkwort before it flowers and produces seed. Thoroughly bag and remove all cut vegetation, as seeds can mature even on dead plants. Wear protective clothing such as gloves and long sleeves to reduce exposure to the irritating oils of Stinkwort foliage. Mowing stinkwort may help with controlling proliferation late in the season, but low branches will evade mowers and may continue to grow. A second mowing of stinkwort is recommended in mid- to late summer when the soil has dried out. Mowing activities must be scheduled carefully since mowing may lead to sparks between mower blades and rocks on the ground igniting wildfires during dry periods. Clean all equipment.

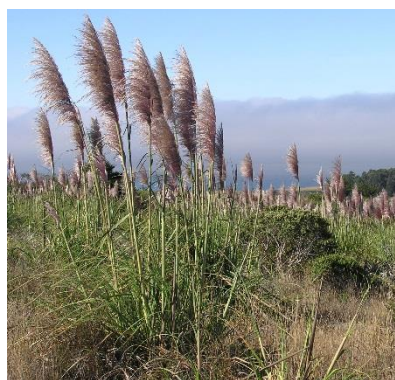
For herbicide treatment use a foliar spray with Triclopyr (Garlon) is effective early in season when plants are small and before they begin to flower. The plant must be saturated for herbicides to be effective. May and June are the best months for applying herbicide treatments to eradicate stinkwort; herbicide is ineffective once stinkwort has developed flowers and causes seeding as a stress response. (See table on page 11 below for herbicide rates for each treatment)

Please be sure to avoid damage to these Native Look-a-Likes:

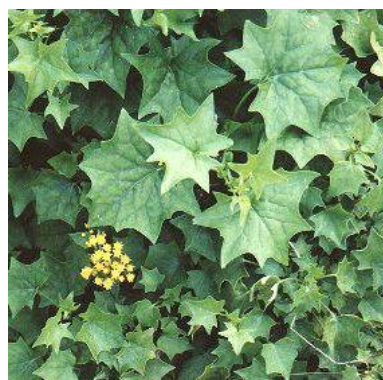
Tarweeds: California native tarweeds have a similar lifecycle to stinkwort, flowering late in the season. Mature tarweeds range from 1 – 1 ½ feet tall. The lower leaves are long and slender like the stinkwort, but the upper leaves are flat against the stem and hairy. Tarweed flowers may be yellow or white.

Additional “Zero Tolerance” invasive plants you can help us control:

Please notify Conservancy staff immediately if you find any of these species in any location on The Preserve. Early detection can save valuable resources by eliminating these highly aggressive species before they have a chance to establish and spread. Of particular interest are the following, which are spreading rapidly outside The Preserve.



Pampas and Jubata Grass *Cortaderia* spp.



Cape Ivy *Delairea odorata*



Fountain Grass *Pennisetum setaceum*



Mexican Feather Grass *Nassella tenuissima*

For more information on managing invasive plants in Homelands or Openlands, as well as assistance with fuel management or locating property boundaries, please contact Lindsay Cope, Conservation Program Manager (831) 238-2210 and lcope@slconservancy.org.

Sources:

DiTomaso, Joseph M., Healy, Evelyn A. 2007. Weeds of California and Other Western States Vol. 1. University of California Agriculture and Natural Resources.

Marriott, M., Tertes, R. and C. Strong. 2013. South San Francisco Bay Weed Management Plan. 1 st Edition. Unpublished report of the U.S. Fish and Wildlife Service, Fremont, CA. 82pp.

The University of California Agriculture and Natural Resources Statewide Integrated Pest Management Program (UC IPM): www.ipm.ucanr.edu

California Invasive Plant Control (CAL IPC): www.cal-ipc.org

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Herbicide Application Rate

Species	Common Chemical Name	Product Example	Rate per Acre (Broadcast)	Backpack Sprayed Treatment	Cut Stump Application	Basal Bark Application	Time of Application	Remarks
French Broom	Imazapyr	Polaris	-	1-3%	6.3% (in water)	-	Early fall before the leaves drop.	
	Triclopyr	Garlon 4 Ultra	-	0.75-1.5%	12% (88% oil)	20 % v/v Garlon in 20% v/v crop oil and water	Foliar Spray: April to July, after leaves are fully developed and when actively growing. Cut Stump and Basal Bark: Any time of the year.	Do not spray in temoeratures above 80F
Poison Hemlock	Imazapyr	Polaris	2 pt + adjuvants	0.75-1.5%	-	-	Spring, seedling to rosette stage.	
	Triclopyr	Garlon 4 Ultra	5-8 pt	0.5-1%	-	-	Spring, Postemergence in seedling to rosette stage.	Do not spray in temoeratures above 80F
Thistles	Aminopyralid	Milestone	3-5 ounces	3-5%	-	-	Winter to early spring, rosette through boloting stage.	
	Clopralid	Transline	0.25-0.67 pints	1-3%	-	-	Fall to early spring during early rosette stage.	
Stinkwort	Triclopyr	Garlon 4 Ultra	2-4 pt + surfactant	0.25-1%	-	-	Sprint to summer, before flowering	Do not spray in temoeratures above 80F