
Project Goal:

Report on extent of invasive non-native Stinkwort (*Dittrichia graveolens*)¹ at the Galindo Field Station at Cal State East Bay in Concord. Share botanical/ecological insights about the species and report on the possible implications for current grazing practices and the general health of the Station property ecosystem. Review options for control and suggest options for follow-up.

What is Stinkwort?

Stinkwort is a fall-flowering, sticky aromatic annual plant in the aster/daisy family (Asteraceae), native to the Mediterranean area. It has become invasive in many parts of the world, arriving recently in California (around 1984).

Council (Cal-IPC)

posing a M

.² The California Invasive Plant

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Stinkwort is causing alarm as it rapidly spreads, threatening grazing lands, vineyards and valued existing ecosystems [see Figure 1].

Stinkwort thrives in our Mediterranean climate, and tolerates a wide variety of soils and range of soil moisture, from very dry conditions to the margins of wetlands. It needs near-full sun to thrive (i.e., a grassland/pasture environment). It invades aggressively in disturbed areas and over-grazed pastures and into bare patches along roadways and field edges. Because of its enormous seed production (15,000+ seeds/plant!), it can spread very rapidly. While naturally distributed by wind (to 200 meters) or water, its sticky seeds attach to bikes, cars, people and animals, and it

hoto #1]. The

Where is Stinkwort currently found at the Galindo Field Station (and is it expanding)?

Stinkwort at Galindo is easily seen along the immediate edges of the entry roadway (past the gate) [#6; #7], intruding in lower density into the grassy area on the east side of the roadway (in the direction of the creek bed). There are a few patches in the grassy area to the east of the creek (a prime spot for further invasion). There is a dense line of Stinkwort on the west side of the barbed wire fence in the grazed portion of the station [#8], where soils show more disturbance by ranch vehicles, but is by far most

the approximate middle of the grazed portion of the Station [#9; #10]. Notable near-monoculture stands appear in this area [#11], and continue west beyond the boundary of the Field Station [#12]. As Stinkwort reaches its seed-bearing maturity in September/October (after the annual oats and other grasses have dried, browned and begun to lay down), the bright lime-moderate to dense stands of Stinkwort in these areas are very easy to spot on the landscape [#13]. Anecdotal reports from neighbors and others suggest that coverage and density of invasive Stinkwort has been noticeably expanding at the Station, but no formal comparative measurements have yet been made.

So Bad About Stinkwort?

Stinkwort shares the negative characteristics of all invasive plants, but is worse than many.

It threatens existing ecosystem health by exploiting disturbances to form dense stands, creating sterile monocultures that crowd out natives or more desirable **plants** that better service the ecosystem (e.g., by providing food to native **insects**). While Stinkwort feed certain insects, a monoculture that depresses the diversity of native forbs will exclude plants upon which certain insects are uniquely dependent reducing the diversity and productivity of the flora and larger ecosystem. Stinkwort on serpentine and saline soils provides it with broad target areas for infestation (including some areas where rare California native plants currently enjoy dominance and protection from most invaders).

While grazers generally avoid Stinkwort naturally, if ingested, the barbed seeds embed in the intestine and can cause sickness and death, particularly in sheep. The meat and milk of cows becomes tainted, and the milk is often rejected by calves.

A recent study demonstrated that **treatment of mature plants with the herbicide imazapyr (Habitat) was effective against both the plant and its seeds**.¹⁰

Consider the possible need for permits/approvals (and possible opposition from some environmentalists): wetland areas in particular may shelter threatened species like red-legged frogs, pacific garter snakes and other amphibians.

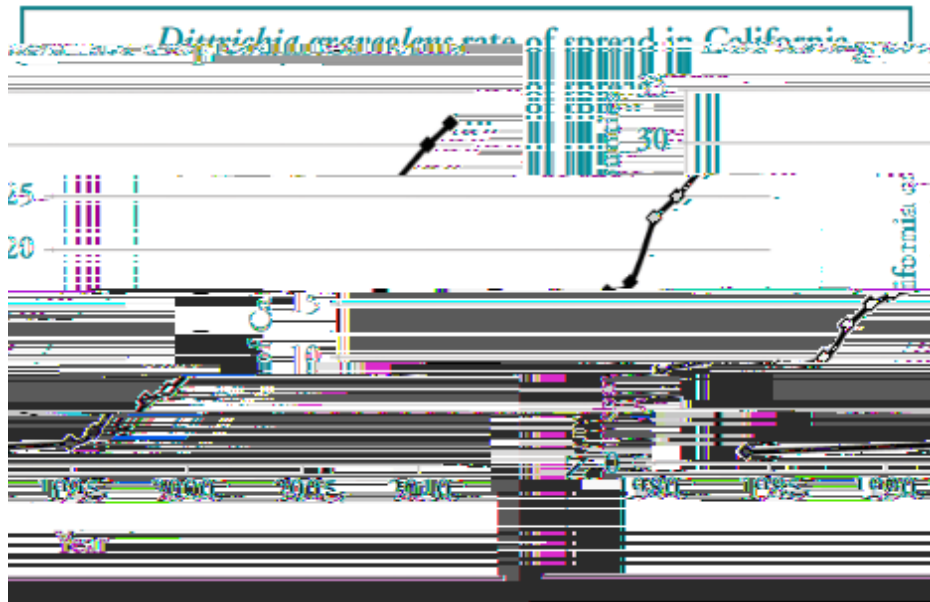
SUMMARY: AUGUST IS STINKWORT ELIMINATION MONTH! [See Figure 2]. Mowing before flowering begins may prove effective (and will certainly prove helpful). The existing seed bank will make aggressive efforts necessary for 2-3 years (believed to be the life of older seeds in soil). While recontamination is likely, more limited infestations, caught early, could be targeted with well-timed spot herbicide treatment or hand pulling (if cost-effective). A nice summary document with additional information on herbicide use/efficacy is at https://wric.ucdavis.edu/information/natural%20areas/wr_D/Dittrichia.pdf.

Further reading:

See links in footnotes throughout (bolded items of particular value/interest)

Figures & Photos

Figure 1: Rate of Spread



Photos #2: Close-up of stem, flowers and leaves



Photo #3: Root ball showing Taproot

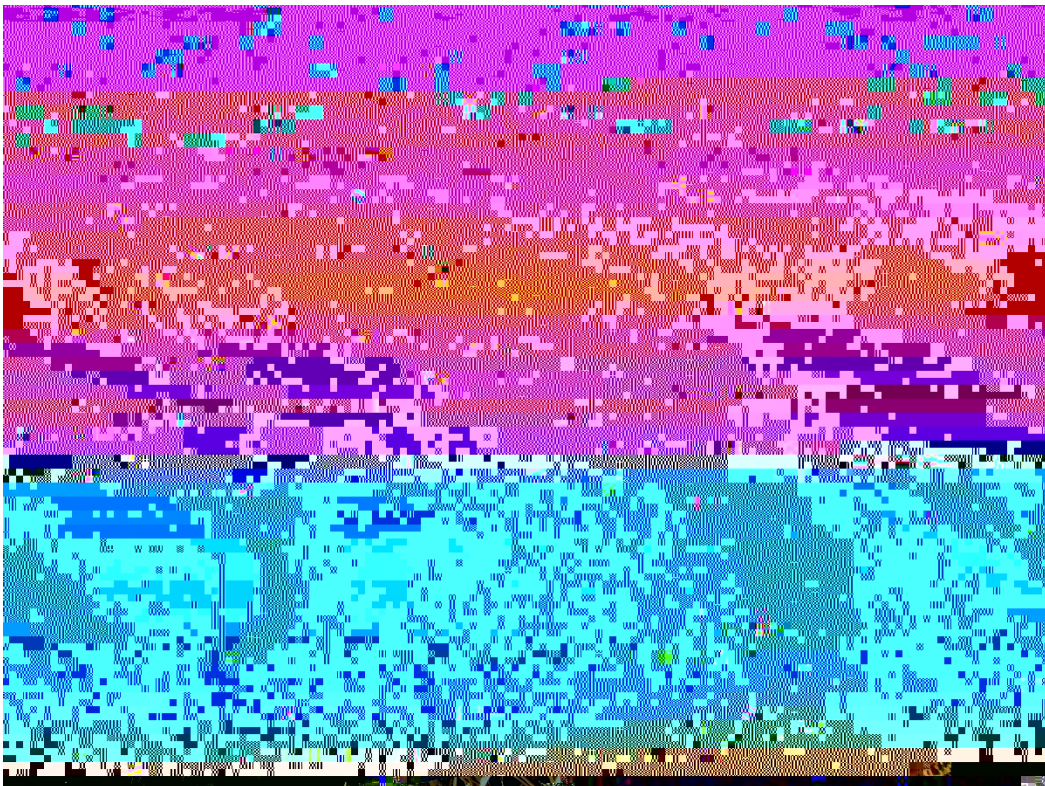


Photo #8: Stinkwort along Fence in Grazing area (note preference for bare/disturbed soil):

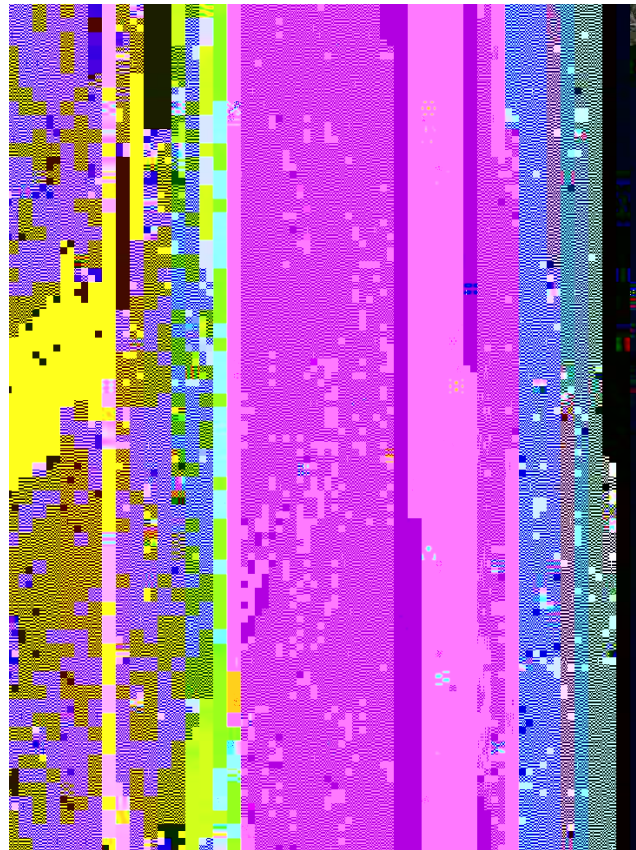


Photo #9: area view from South looking North



**Photo #10 Stinkwort within central
area North looking South**

**Photo #11: Stinkwort within central
area**

Photo #12: Stinkwort continuing to West of Field Station Property

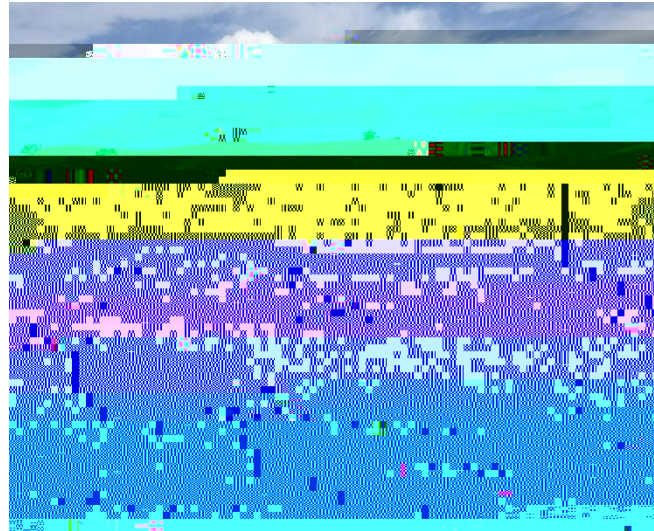


Photo #13: Lime Green Stinkwort stands out on Galindo Property in Early October

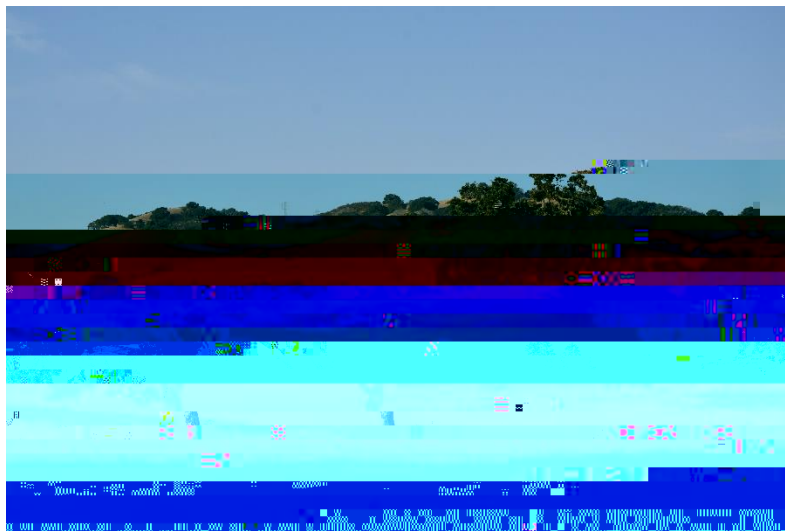


Figure #2:

August is Stinkweed Removal Month!
(full sized, but not yet flowering)

