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Coordinating Science and Land Management across the Nature Reserve of Orange County

# Invasive Species Issue

Invasive species management is one of the most important, but commonly misunderstood functions of sustaining a nature preserve. In this edition of NCC Quarterly, we will examine some of the emerging and problematic invasive plants and animals prevailing within the Nature Reserve of Orange County. We will also address the essentiality of invasive species management for the long-term ecological health of the Reserve and the mission of protecting and recovering multiple species and habitat.

The United States Department of the Interior (DOI) defines "invasive species" as a non-native organism whose introduction causes or is likely to cause economic or environmental harm, or harm to human, animal or plant health. Furthermore, the DOI defines "invasive species management" as activities including, but not limited to planning, monitoring, prevention, early detection, rapid response, eradication, control, restoration, research, and regulatory approaches used to minimize the threat of invasive species.

Unless you are a biologist or ecologist, you may be unaware that invasive plants are one of the leading causes of native biodiversity loss. The California Invasive Plant Council (Cal-IPC) notes "invasive species are the second greatest threat to native plant species persistence, surpassed in importance only by direct habitat loss through human activities such as land development."

Invasives spread quickly, displace native plants, degrade habitat, and negatively impact the food supply for local wildlife. In addition, invasive species often have extensive root systems and outcompete native plants for moisture and nutrients. Without the prevention and ongoing removal of invasive species, regional protection and recovery of multiple species and habitat would not be an achievable outcome.

The Natural Communities Coalition and its partners maintain an active role in addressing invasive species through its 5-year Invasive Plant Management Plan, developed in coordination with Cal-IPC. The plan details methods to effectively control invasive plants in the Central Reserve portion of Orange County's Central/Coastal NCCP/HCP Reserve. The plan includes recommendations for annual management strategies, processes to facilitate early detection and rapid response, and protocols for tracking and reporting progress. A copy of the plan can be downloaded **here**.

One of the current trends among landowning agencies is to amend their Integrated Pest Management practices to reduce the use of systemic herbicides (e.g. glyphosate) and thus minimize public contact with chemical based pesticides. As these changes make great sense within community and neighborhood park settings, it becomes extremely difficult to control the spread and long-term damage of invasives on larger natural open spaces without the use of pesticides.

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# Emerging Invasive Plants

Two of the more troublesome species of invasive plants found in the Nature Reserve are Stinknet (*Oncosiphon piluliferum*) and Stinkwort (*Dittrichia graveolens*). Both species are in the sunflower family (Asteraceae), produce small yellow flowerheads, have potential allergy implications, and emit a pungent, not so pleasant (stink) odor.

Stinknet, also known as Globe Chamomile, is an erect annual herb, which is native to South Africa. Stinknet has globe-shaped, flowerheads which have no petals. It is a prolific seeder, which emerges from the ground in late November and may bloom from March to July. It often grows on disturbed clay, sandy and gravelly soils. In rainy winters, stinknet may rapidly grow with infestations spreading throughout open spaces, roadways, and agricultural field edges and into riparian habitat. Stinknet plants commonly displace native vegetation, cause severe allergic reactions in humans, both dermal and respiratory, and are highly flammable. The Sonoran Desert Cooperative Weed Management Area has indicated if stinknet is allowed to spread for two years, manual removal becomes impossible.

Controlling stinknet typically involves repeated manual removal and repeated post emergent herbicide applications. The California Invasive Plant Council (Cal-IPC) has designated a "high" invasive rating for stinknet, which means the species has severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. In addition, Cal-IPC indicated stinknet's reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment.

Stinkwort is a native to southern Europe and is commonly found on disturbed soils or roadsides, gravel areas, washes, fields and riparian woodlands. It is an upright, fall flowering annual herb which grows up to 3 feet tall. Stinkwort prefers well-drained, sandy or gravelly soils.

The concerns regarding stinkwort include its rapid expansion throughout Orange County and the potential impacts it may have on human activity and livestock. It causes allergic contact dermatitis in humans and has been implicated in livestock deaths by way of its barbed bristles puncturing the small intestine.

Cal-IPC indicates the stinkwort invasive rating is moderate, which translates to stinkwort having substantial and apparent, but generally not severe, ecological impacts on physical processes, plant and animal communities, and vegetation structure. There is a Cal-IPC alert however on stinkwort as it has the potential to spread much further.

Stinknet

Stinkwort

Invasive Mustard at Limestone Canyon

# Invasive Pests – Borer Beetles

The Polyphagous shothole borer (PSHB), Kuroshio shothole borer (KHSB), and goldspotted oak borer (GSOB) are invasive beetles that invade, injure and potentially kill native and landscape trees and shrubs. Experts believe the PSHB and the KHSB were introduced to Southern California from Vietnam (PSHB) and Taiwan (KSHB). The GSOB is believed to be a native of southeastern Arizona. All three beetles presumably found their way to California through infested wood products, nursery trade or shipping materials.

PHSB was discovered at Whittier Narrows in Los Angeles County in 2003, but at the time was believed to be a tea shot hole borer, which is a much less destructive species. The beetle remained unnoticed until 2012 when it became formally identified as PHSB in a backyard avocado tree. In 2023, PHSB can be found in Orange, Los Angeles, Riverside, San Bernadino, Ventura and Santa Barbara Counties.

KHSB was initially discovered in 2014 among commercial avocado groves and landscape trees in San Diego County. In 2015, a significant infestation was identified in the Tijuana River Valley. Through a four-year span, KHSB was categorized as infecting approximately 375,000 willow trees and killing more than 122,000 of those trees in the Tijuana River Valley.

According to researchers Dr. John Boland and Dr. Kellie Uyeda," when KSHB attack a tree, the females drill into the trunk and create galleries of tunnels in the wood by pushing sawdust 'tailings' out of the entrance hole. They inoculate the tunnel walls with a fungus (e.g., Fusarium sp.), and live in the tunnels eating the fungus and reproducing. Within a few weeks new females emerge, and start another gallery in either the natal tree or a new tree. The beetles are tiny (~2 mm in length) and seldom seen, however if there are enough of them they can damage and even kill trees via their tunneling activities, which undermine the structure of the tree trunk."GSOB was identified in California in 2004 but was not linked to extensive oak mortality until 2008. Like the other borers, GSOB larvae impact the future growth of its host, however GSOB remains exclusive to oak trees, whereas the PHSB and KHSB may invade multiple tree species. Within Weir Canyon (OC Central Reserve), a broad section of coastal live oak trees has been identified as being infected with GSOB and is being closely monitored by scientists and land managers.

Top: Shot Hole Borer beetle infested tree.
Bottom: Gold Spotted Oak Borer Damage

The University of California Agriculture and Natural Resources Department, UC Cooperative Extension, and John Kabashima Ph.D. have taken the lead to carefully study invasive beetles and inform landowners and land managers of best practices in detection and minimizing current and future damage. A video which describes the pest-disease complex and how to identify it can be accessed **here**.

## *Invasive Species Issue* *From page 1*

In 2018, the Natural Communities Coalition (NCC) released the document "Best Practices for Implementation of Invasive Plant Control for Resource Management on the Nature Reserve of Orange County." This paper, approved by the NCC Board of Directors, supported by the United States Fish and Wildlife Services and California Department of Fish and Wildlife, and endorsed by the California Invasive Plants Council, provides the processes and systems landowning agencies may adopt to effectively manage invasive species within their charge. A copy of the document can be downloaded **here**.

# *Invasive Reptile – Sonoran Spotted Whiptail*

The California Department of Fish and Wildlife (CDFW) recently issued a Local Assistant Grant to study the invasive threats of the Sonoran spotted whiptail (*Aspidoscelis sonorae*) upon Orange County's Central-Coastal NCCP/HCP.

The Sonoran spotted whiptail (SSW) is a lizard native to central and southeast Arizona and extends into parts of New Mexico, with isolated populations in the Chiricahua and Catalina Mountains of Arizona, and south into the northern parts of the states of Chihuahua and Sonora in Mexico.

SSW are approximately 9-10 inches in length and have a long, slender tail, which is about twice the length of its body. Their appearance is very similar to the orange-throated whiptail (OTW), which is one the three target species receiving regulatory coverage under Orange County's Central-Coastal NCCP/HCP. With the NCCP/HCP providing long-term protection for the coastal sage scrub habitat, which supports the three target species, it was reasoned that any threat to the target species is a potential threat to many other species that share this important habitat.

According to the Journal of Herpetology, the SSW is a parthenogenetic species. Thus, there are no males in the population and every individual is a female which can produce fertile eggs without mating. This allows for a rapid population expansion as compared to the sexually reproducing OTW species.

Concerns regarding the SSW have been raised since the lizards were first discovered in Orange County in 2014. It is believed the SSW is a threat to OTW and an additional native lizard species, known as the coastal western whiptail. CDFW has identified some potential interactions among the species such as direct predation, habitat competition and hybridization.

How the SSW made its way to Orange County is unknown, but populations have been recently discovered near Orange County nurseries, implicating the plant nursery trade. If SSW populations in Orange County are connected to nurseries, it is likely that plants, such as succulents or other plants often grown in areas of states native to SSW, are acting as transports into Orange County where they are brought in for sale. It is also likely other southern California communities are impacted by this invasion.

Sonoran whiptail

The objective of the CDFW grant is to establish if the SSW is a true threat to the OTW and what the source of that threat is to the species. An additional goal of the study is to determine the proximate threats of the SSW to other native species in the region, including the whiptail and native invertebrates, including endangered butterflies.

Organizations collaborating on the project include the United States Geological Survey, The Nature Conservancy, Irvine Ranch Conservancy and Natural Communities Coalition.

For more information about CDFW local assistance grants and other grant opportunities, go to https://wildlife.ca.gov/grants


## ACKNOWLEDGEMENTS:

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- Calflora
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- California Native Plant Society
- Orange County Chapter California Native Plant Society – occnps.org
- University of California Cooperative Extension
- California Department of Fish and Wildlife
- United States Fish and Wildlife Services