



# ACE'ing New Statewide Maps of Invasive Plants for Conservation Planning

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## Background

The California Department of Fish and Wildlife (CDFW) partnered with the California Invasive Plant Council (Cal-IPC) to create two statewide maps of invasive plants for CDFW's Areas of Conservation Emphasis (ACE). ACE analyzes large amounts of spatial data to summarize biodiversity, significant habitats, habitat connectivity, and climate change resilience. Its maps provide information for conservation planning, ecological research, and land-use planning. ACE also includes stressor layers, such as sea level rise and urbanization, to show where important ecological areas might be threatened.

CDFW's Biogeographic Data Branch wanted to add an ACE layer on invasive species so CDFW approached Cal-IPC. Cal-IPC's CalWeedMapper database (www.calweedmapper.cal-ipc.org) provided statewide information for 225 invasive plant species, combining GIS data and expert knowledge from land managers, updated by datasets and individual observations from the Calflora database (www.calflora.org).

## Species Included

- Maps include all Cal-IPC Invasive Plant Inventory species rated High, Moderate, or Limited, and Calflora data points from 2000 or later.
- The Terrestrial map (Fig. 1) includes terrestrial and riparian species.
- The Aquatic map (Fig. 2) includes species with a National Wetland Plant List wetland indicator status of Obligate or Facultative-Wetland (USDA PLANTS Database, plants.usda.gov).
- Maps are consistent with ACE's terrestrial and aquatic biodiversity maps, which also repeat riparian species.
- Note that results may be affected by biases in species identification and reporting.



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Maps show the relative "level of invasion" in each USGS quad. The data and approach may also be used to assess relative level of invasion within a region. Such analyses can be used for large-scale planning efforts, e.g. Habitat Conservation Plans or CDFW's Regional Conservation Investment Strategies, and to inform where to prioritize ecological restoration. Read Cal-IPC's Summer 2020 [Dispatch](#) for more information.

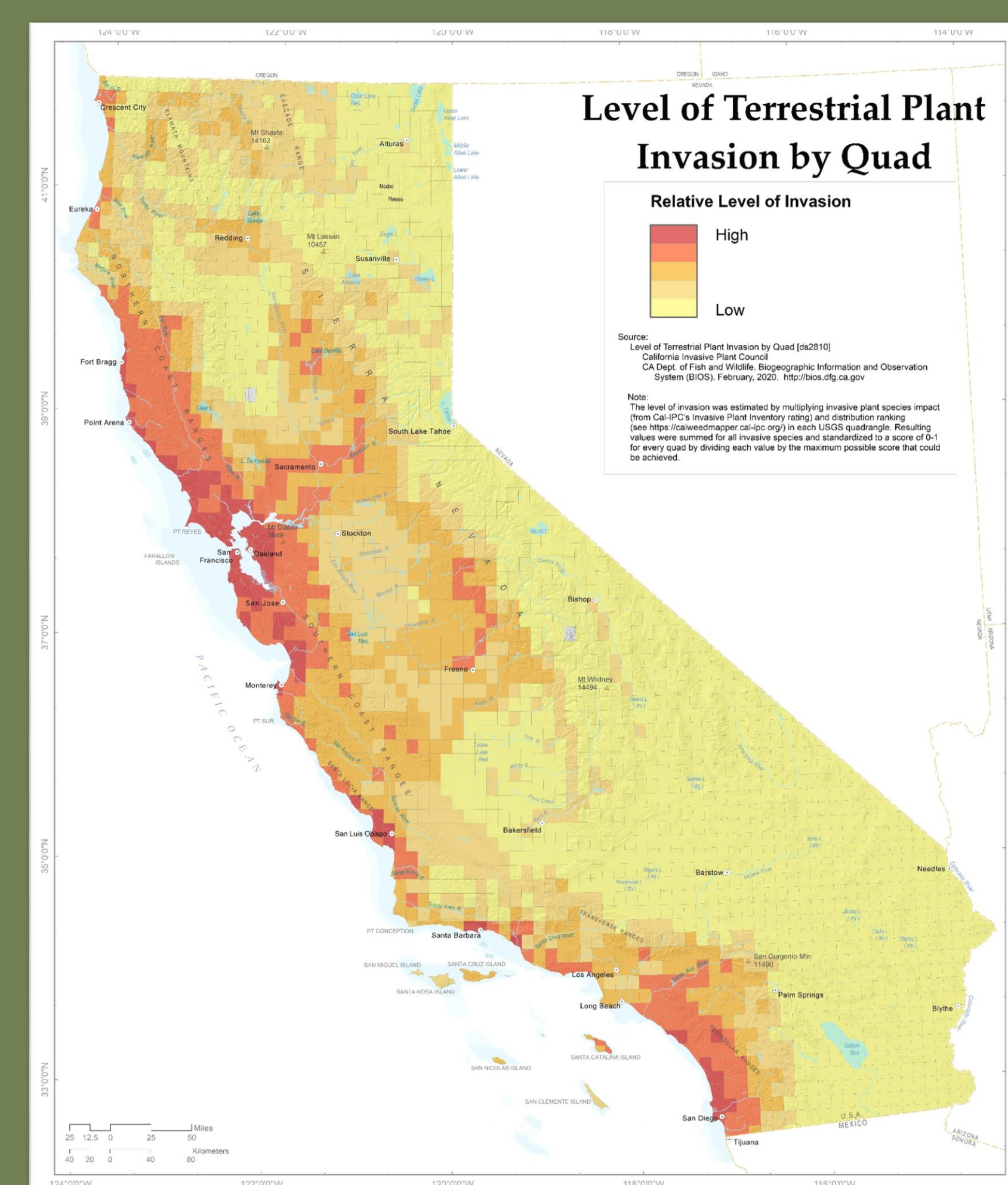
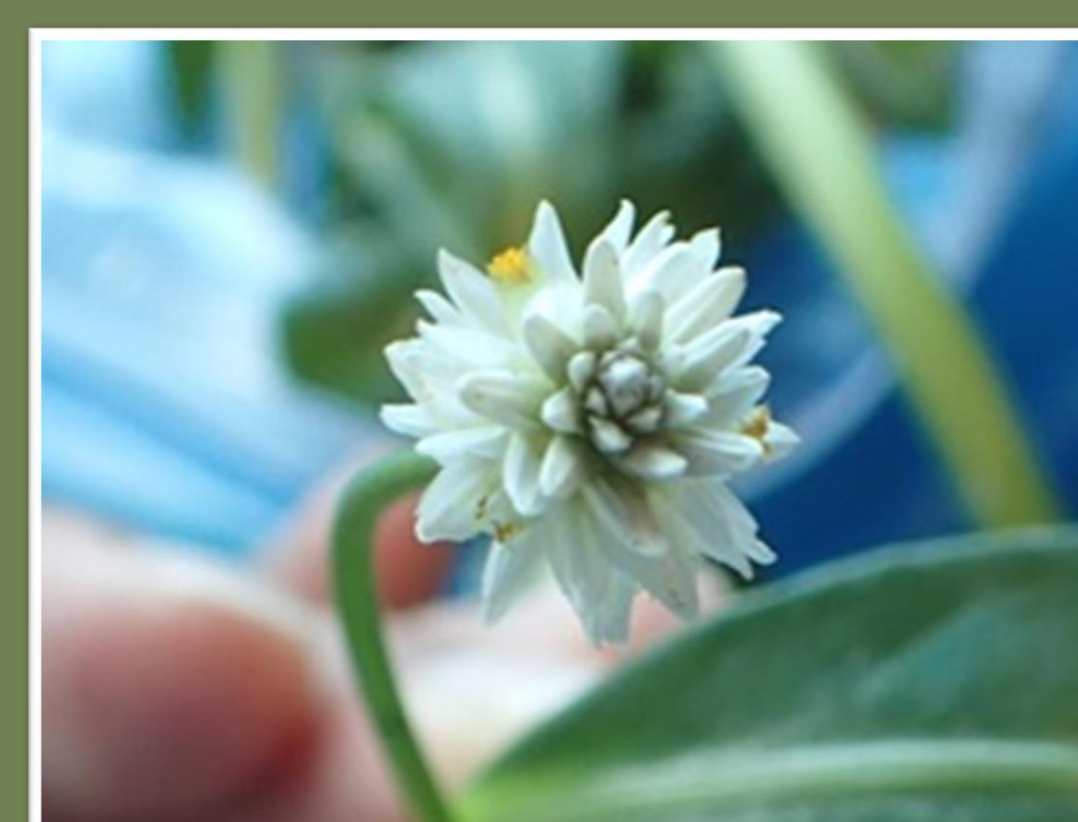


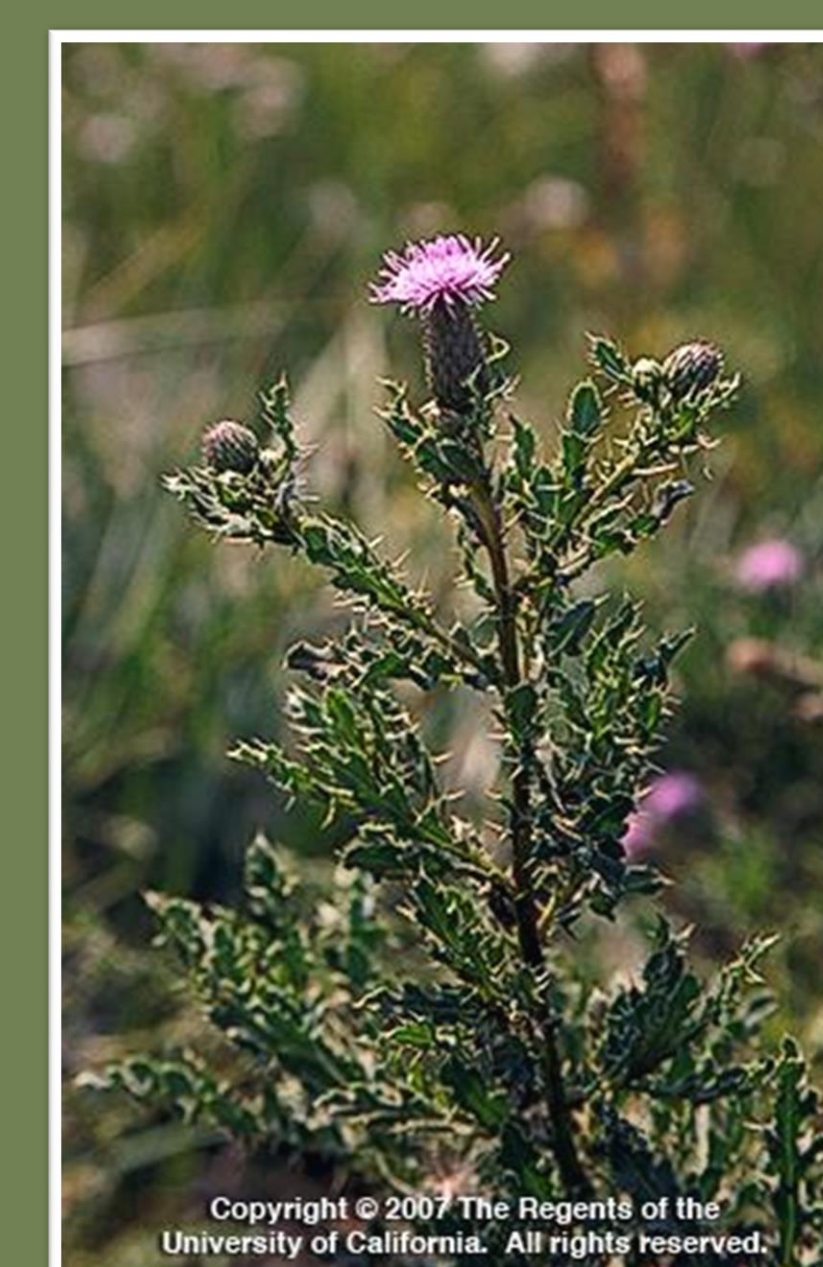
Figure 1

## Aquatic Invasive Plants



Alligatorweed  
(Division of Boating and Waterways)

## Terrestrial Invasive Plants



Canada thistle  
(J. DiTomaso, UC Davis)

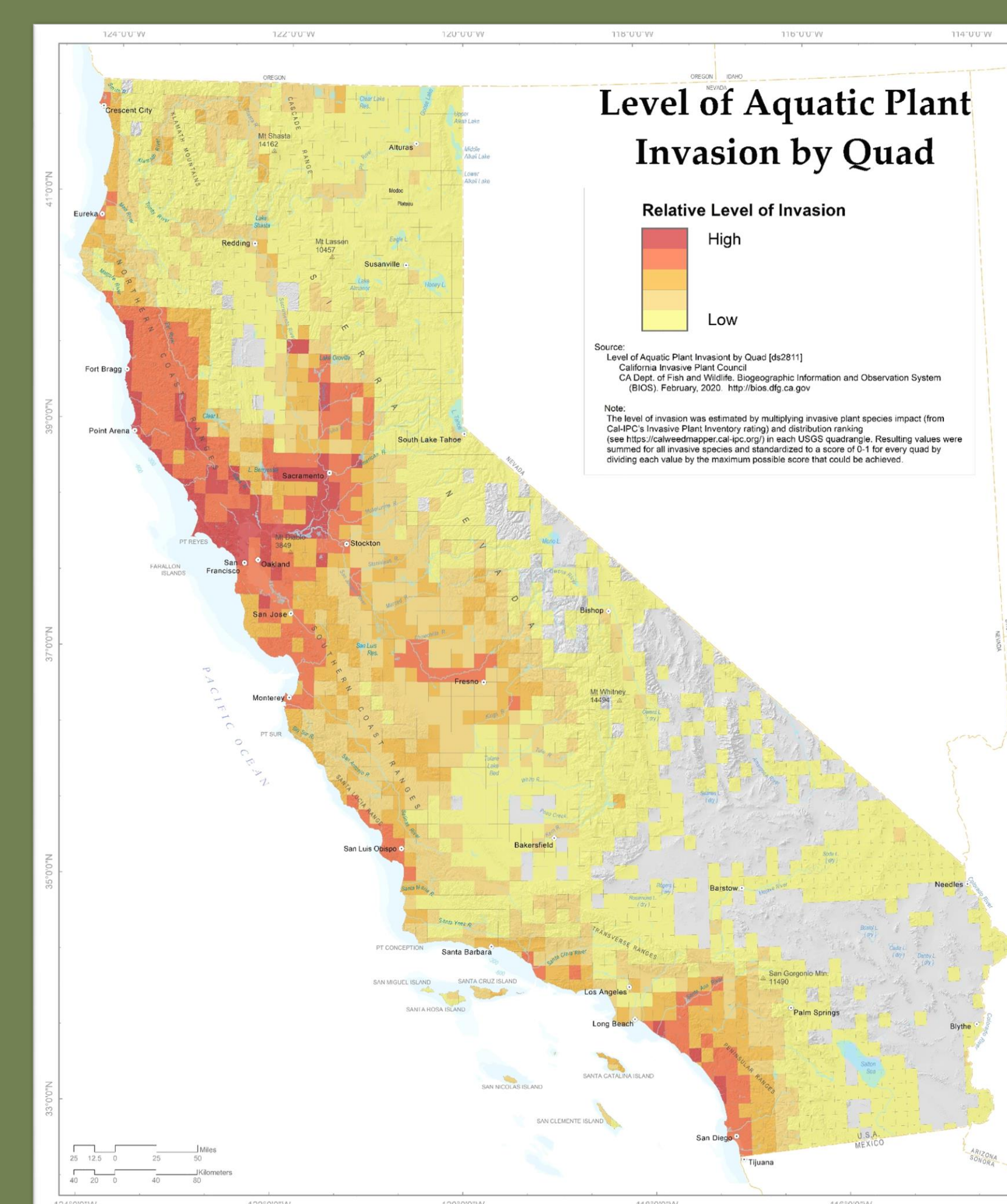


Figure 2

## Invasive Level per Quad

For each plant occurrence within a USGS quadrangle:

R = Cal-IPC Inventory rating

D = Distribution based on invasion curve

Value per quad = Sum of (R x D) for all species

Distribution was based on data coding in

CalWeedMapper, which combines abundance and rate of spread into an estimate of each plant occurrence's position along the typical invasion curve (Fig. 3).

We calculated the "ultimate weedy quad" R x D sum with all species at high distribution, then divided the R x D sums by the ultimate weedy quad value to calculate the total invasive level per quad. The result is a ratio between 0-1.

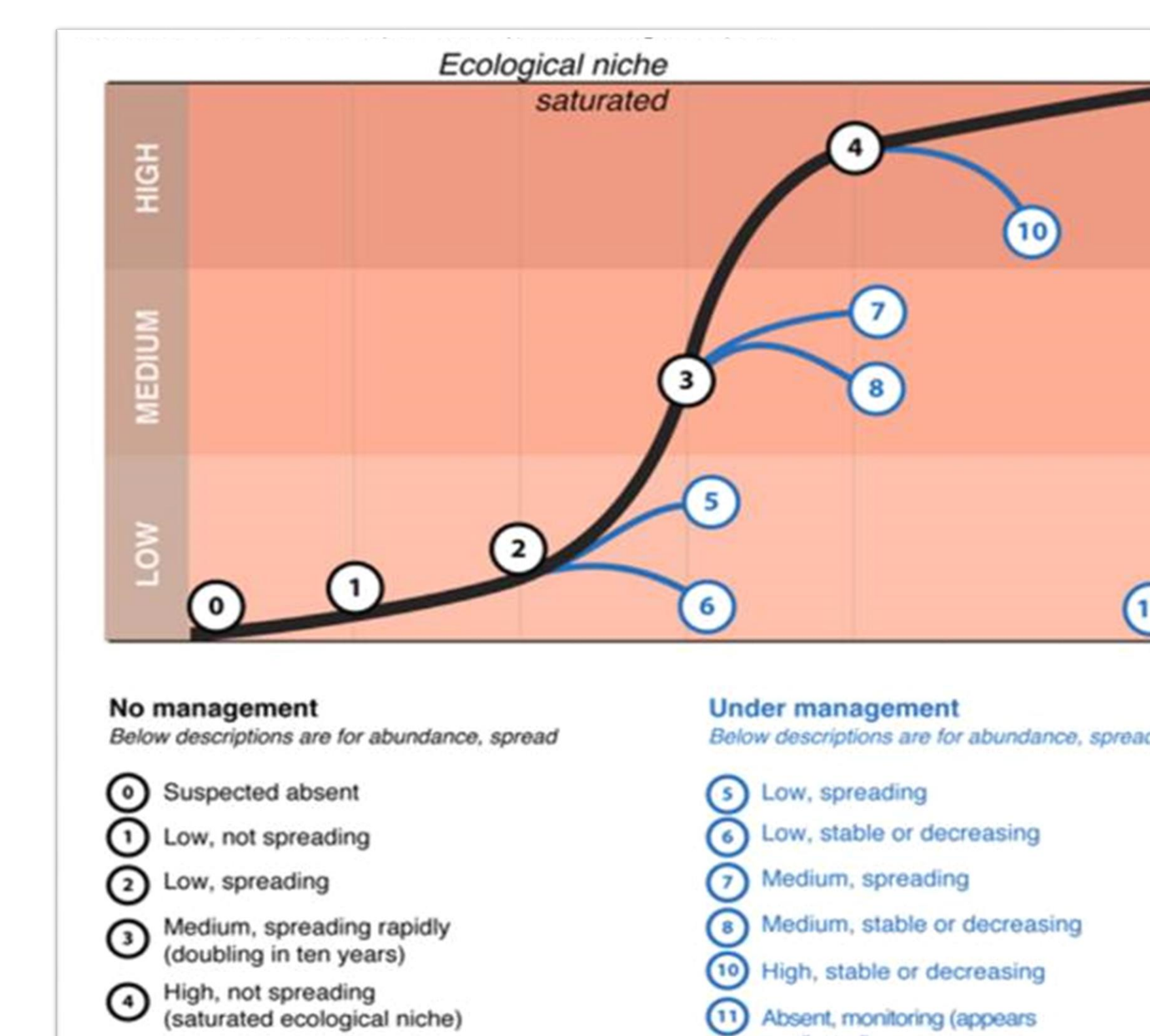


Figure 3. CalWeedMapper codes used for Distribution. (Graphic by Cal-IPC)

## Acknowledgments

Thank you to CalWeedMapper and Calflora data contributors for plant occurrence information, and to Ryan Hill and other staff of the CDFW Biogeographic Data Branch for GIS analysis.

Link to ACE Viewer at <https://wildlife.ca.gov/Data/Analysis/Ace>