Identifying emerging invasive plants for early eradication on the San Mateo County coast

Dana Morawitz, Elizabeth Brusati*, and Doug Johnson, California Invasive Plant Council (Cal-IPC), Berkeley, CA. edbrusati@cal-ipc.org, www.cal-ipc.org

Abstract

Cal-IPC, the Bay Area Early Detection Network (BAEDN) and San Mateo County land managers undertook an effort to identify the most important emerging weeds for early eradication. Starting with a list of 68 non-native plant species, we determined which had the optimal combination of sparse distribution and high risk of spreading and causing ecological impacts in the future. With support from the US Fish & Wildlife Service's Coastal Program, Cal-IPC led the assessment effort using three complementary approaches: (1) reviewing data in the Calflora database to gauge current distribution of naturalized non-native plants in the region; (2) conducting expert interviews to verify distribution and perceived risk; and (3) screening plants using the Plant Risk Evaluation (PRE) criteria system from UC Davis to predict risk based on life history factors. The resulting short list of 12 emerging weeds to target for early eradication will be used by local partners to survey and identify control opportunities.

Introduction

Invasive plants can significantly impact vegetation and wildlife communities, even ecosystem processes, when they become widely distributed. The impacts of climate change on native flora and fauna provide a strong rationale for controlling invasive plants, since the opportunistic capacity of invasive plants is likely in many cases to enhance their competitive edge over natives when there is additional disturbance. Given the need to provide corridors of connectivity for species to move freely as needed, it is essential to make sure that invasive species don't restrict movement along these linkages. The National Fish, Wildlife and Plants Climate Adaptation Strategy (2012) recommends addressing existing stressors such as invasive species as an immediate no-regrets action that we can take to help wildlife adapt. The 2015 update to the State Wildlife Action Plan lists invasive species more often than other stressor on wildlife (www.wildlife.ca.gov/SWAP).

The most effective solution is to manage invasive plants while populations are still small and distribution is limited. To undertake such early eradication land managers need to know which invasive plants have the most potential to cause harm and which are feasible to eradicate.

Invasive plant management on the San Mateo County coast, as in most areas, has historically focused on high-profile species, such as Cape-ivy, European beach grass, and pampasgrass. This project aimed to identify a short list of invasive plants suitable as early eradication targets on the San Mateo County coast. The project was conducted from 2012-2014, with ongoing work with partners.

Location

San Mateo County covers most of the San Francisco peninsula. The northern end of the Santa Cruz mountains forms the spine of the peninsula. The western side of the mountains slopes down to coastal bluffs overlooking the Pacific Ocean. The region supports important dune, grassland and coastal scrub habitat that supports a range of wildlife. Twenty-seven plant species in the region have California Rare Plant Ranking, two federally-listed as endangered and three state-listed as endangered.
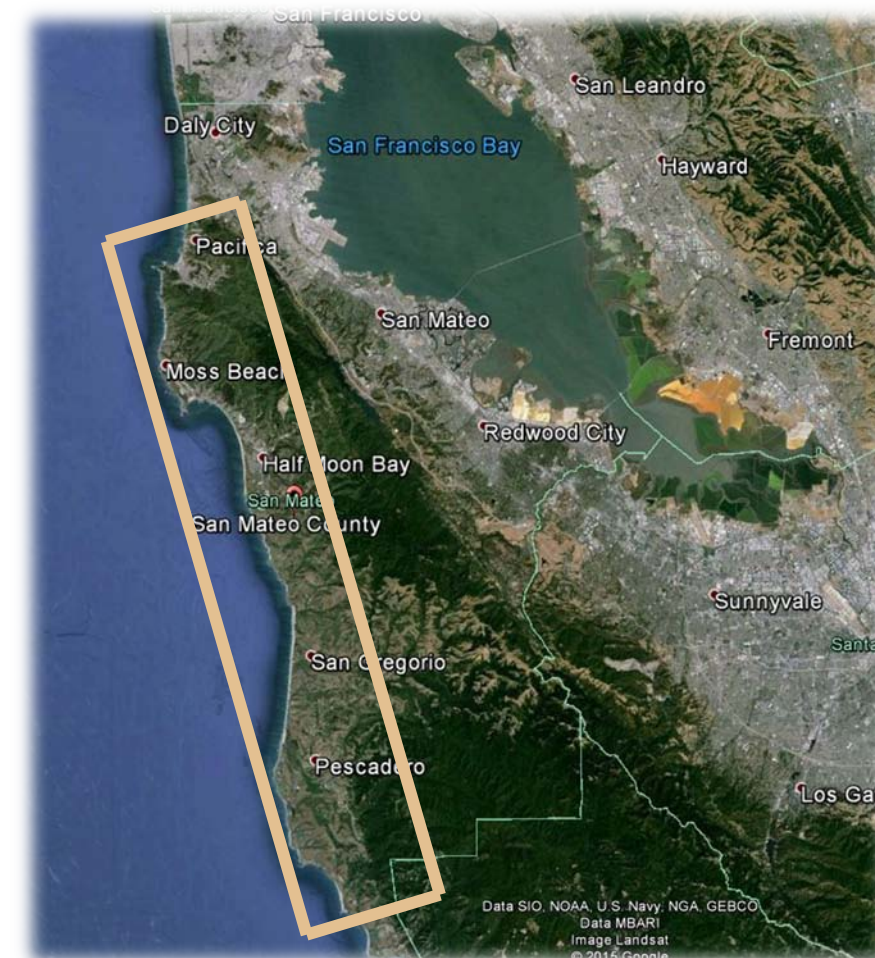
The San Mateo County Coast supports grasslands, coastal sage scrub and other important ecological habitats as well as agricultural lands. Photo: San Mateo Resource Conservation District.

Methods

To prepare, we compiled lists of emerging weeds from BAEDN, Cal-IPC and the San Mateo County Weed Management Area (WMA), arriving at an aggregated list of 68 non-native plant species. We also formed a local expert advisory team recommended by the WMA.

Determining the best early eradication targets requires assessing which naturalized non-native plants have the appropriate combination of sparse distribution and high potential for future impact. We developed an approach for assessing distribution and potential future impact and used this approach to narrow the initial list of emerging weeds to 9 high-priority early eradication targets.

Assessing Distribution – To assess current distribution for each species we used the Calflora online database to determine how many populations have been reported in the San Mateo County coast region. We set 15 reported populations as the maximum number for full eradication to be feasible, and filtered out those species that had more than 15 populations in the region. We then consulted the expert advisory team to filter out plant species that they knew to be much more widespread than evidenced by the number of reported populations in Calflora. (We also used Calflora to determine whether San Mateo County coast populations of a particular species are relatively isolated from populations outside the region—a large infestation in a neighboring region might serve as a continual source of reintroduction, making eradication unfeasible.)

Assessing Potential for Future Impact – From the shortened list of species that are still sparsely enough distributed that eradication from the region are feasible, the expert advisory team selected a dozen that were of highest concern to them based on their knowledge. These 12 species were then assessed using a prototype of the Plant Risk Assessment (PRE) tool then under development at UC Davis (since completed; see Conser *et al* 2015). The PRE tool uses a set of scored criteria to assess the level of risk of a plant spreading and having impacts in a given region based on invasiveness in other regions, reproductive biology, and spread vectors. The chart below shows the scores for each plant species, with scores 18 or greater indicating high potential for future impacts and scores of 14 and lower indicating low potential for future impacts.

PRE score
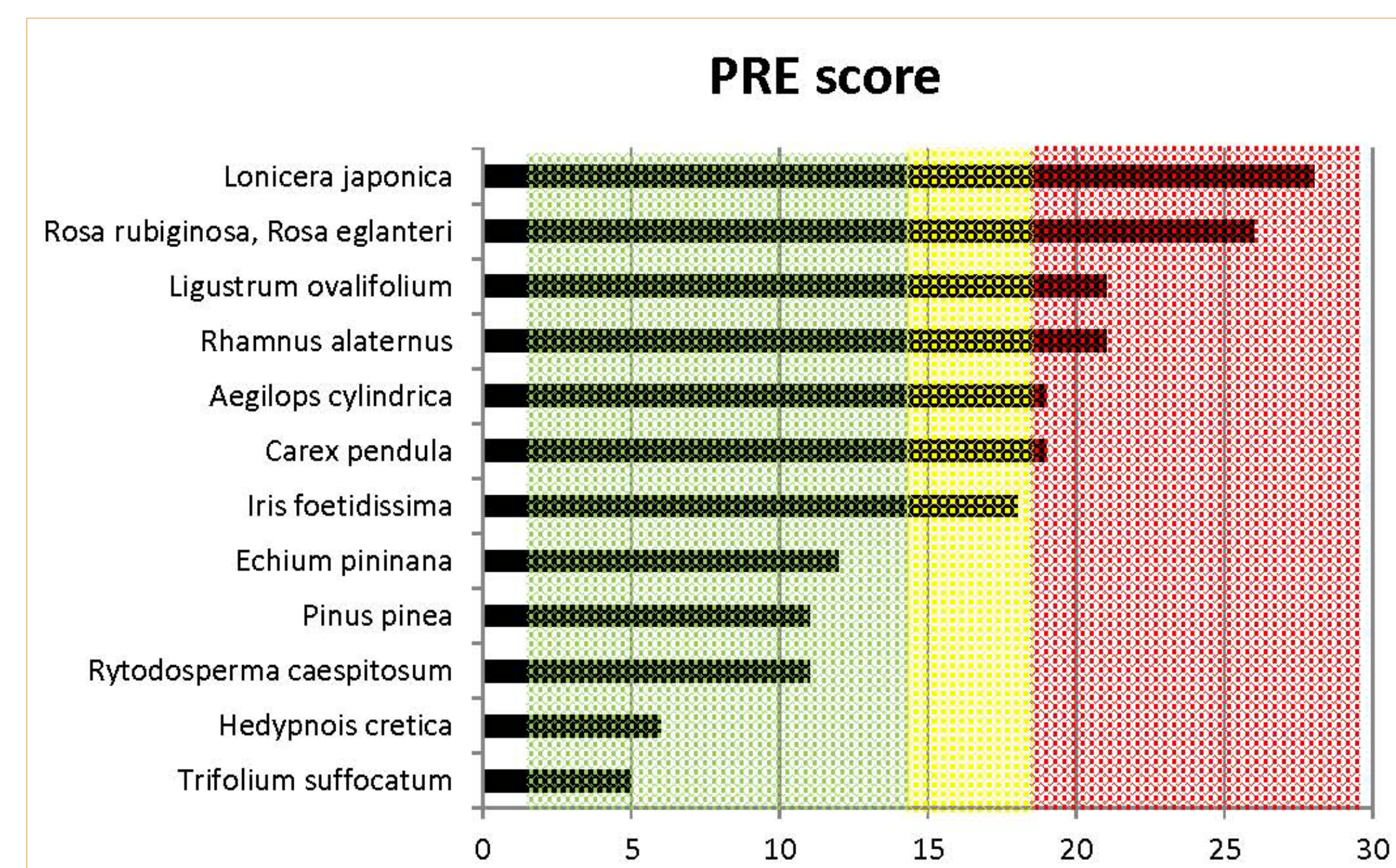
Green = low risk of invasiveness, Yellow = evaluate further, Red = high risk of invasiveness
Chart by Christiana Conser, UC Davis

Results

Based on assessment of distribution and potential for future impact, the expert team selected 9 emerging weed species as priority early eradication targets for the San Mateo County coast region, shown in the table below. Local organizations including the National Park Service, Midpeninsula Open Space District, State Parks, and San Mateo Agriculture Department are now watching out for these species.

Common Name	Scientific Name	Family	Lifeform
Jointed goatgrass	*Aegilops cylindrica*	Poaceae	Annual grass
Hanging sedge	*Carex pendula*	Cyperaceae	Perennial grasslike herb
Stinking iris	*Iris foetidissima*	Iridaceae	Perennial herb
California privet	*Ligustrum ovalifolium*	Oleaceae	Shrub/tree
Japanese honeysuckle	*Lonicera japonica*	Caprifoliaceae	Vine/shrub
Mexican feathergrass	*Nassella (Stipa) tenuissima*	Poaceae	Perennial grass
Italian buckthorn	*Rhamnus alaternus*	Rhamnaceae	shrub
Sweet briar	*Rosa rubiginosa, R. eglanteri*	Rosaceae	shrub
Tufted wallaby grass	*Rytidosperma caespitosum*	Poaceae	Perennial grass

Example: Hanging sedge *Carex pendula*

Native to the United Kingdom, western Asia, and North Africa.

Invades riparian areas.

Becoming a problem in Marin County. Expanding in Purisima Creek, San Mateo County.

Below: Carex pendula in Marin County. Photo by Mill Valley Streamkeepers. Right: Photo by Neal Kramer

Literature Cited

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