Prioritizing invasive plant management on military bases

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Cal-IPC is working with six military installations to make their invasive plant management more strategic and effective. The military manages a large amount of land and its natural resource management must support the military mission while maintaining habitat for sensitive species. The National Wildlife Federation's 2005 report "Under Siege: Invasive species on military bases" described the detrimental effect of invasive species to military activities and natural resources on bases (two of the bases featured in that report were Fort Hunter Liggett and Camp Pendleton). Cal-IPC has aone-year pilot project, funded by the Department of Defense's Legacy Resource Management Program, to develop a process that can be applied to additional installations in the future. The project includes analyzing invasive plant management on the bases as well as connecting the bases to regional partners for the purpose of developing projects on lands near the bases.

Participating Installations

These installations vary widely in size, habitat, and current invasive plan management. Some have extensive programs already while others have limited programs and little connection to regional partners. Each base contains habitat for endangered or threatened species as well as rare plants. Invasive plant management takes place in the context of the military mission for each site, which ranges from training troops to supporting space flights.

Beale Air Force Base (Yuba Co.)

U.S. Army Garrison Fort Hunter Liggett (Monterey Co.)

Vandenberg Air Force Base (Santa Barbara Co.)

Fallbrook Naval Weapons Station (San Diego Co.)

Marine Corps Base Camp Pendleton (San Diego Co.)

Remote Training Site Warner Springs (Navy, San Diego Co.)

Size ranges from 8850 ac to125,000 ac.

Vegetation communities include grassland, coastal sage scrub, chaparral, coastal dunes, riparian, oak woodland, and freshwater and saltwater wetlands.

Current Invasive Plant Management

Invasive plant management programs vary widely by base. Camp Pendleton and Detachment Fallbrook control many invasive plant species and have Early Detection/Rapid Response programs. The other bases have much more limited programs, focusing on a small number of species that affect the military mission or habitat for sensitive species.

Training exercise at Beale AFB (with yellow starthistle). Photo by Robert Scott, U.S. Air Force

For example, Beale Air Force Base manages yellow starthistle because stands of the thistle near the runway attracts birds that pose an aircraft strike hazard. Fort Hunter Liggett controls yellow starthistle because it reduces the ability of the base to provide training areas and damages parachutes. RTS Warner Springs is unusual in that the Navy does not directly manage the land for the base, but uses it for training exercises through use agreements with Cleveland National Forest, the Bureau of Land Management, and Vista Irrigation District.

Camp Pendleton staff participate in the San Diego Weed Management Area. Fort Hunter Liggett conducted a demonstration project on yellow starthistle in conjunction with the Southern Monterey County Rural Coalition. Fallbrook works with the Mission Resource Conservation District to approach landowners.

Prescribed burn for yellow starthistle control at Fort Hunter Liggett. Photo by Rob Pike, Fort Hunter Liggett.

Vandenberg AFB is home to the 30th Space Wing. Photo by Vandenberg AFB.

Acknowledgments

Funding provided by the Department of Defense Legacy Resource Management Program (project 13-621). Thank you to Dawn Lawson (US Navy - SSP Pacific) for assistance with coordination. Thank you to Charles Carroll (Beale AFB); Lauren Wilson (Air Force); Rob Pike and Kim Guilliam (Fort Hunter Liggett); Luanne Lum and Rhys Evans (Vandenberg AFB); Deborah Bieber and Austin Parker (Camp Pendleton); Christy Wolf and Ryan Lockwood (Detachment Fallbrook); Arlene Arnold (RTS Warner Springs) for their expertise. Thank you to regional partners for participating in meetings.

Methods

To develop recommendations for an invasive plant management each base, Cal-IPC examined the current invasive plant program, researched invasive plant data, and met with base staff and regional partners. Each base has an INRMP (Integrated Natural Resource Management Plan) which describes natural resources, threatened or endangered species, and current invasive plant management. We examined invasive plant data for bases and the surrounding area available in the CalWeedMapper website (calweedmapper.cal-ipc.org) and the Cal-IPC Invasive Plant Inventory (www.cal-ipc.org/paf/). The Cal-IPC Inventory rates invasive plants as High, Moderate or Limited threat to wildlands based on a literature review and 13 criteria in categories of Impacts, Invasiveness and Distribution. CalWeedMapper provides statewide maps for the 210 species on the Cal-IPC Inventory based on expert knowledge and GIS data.

We generated a summary from CalWeedMapper for the area around each base, listing species as potential targets for surveillance, eradication, and control. Surveillance refers to species that are not on the Base but are nearby. Eradication targets are those species present on the base but that are not widespread in the surrounding area. Control targets are more widely-distributed species on the base. The Cal-IPC Invasive Plant Inventory was used to examine potential impacts, dispersal, and vegetation communities known to be invaded by each species. The initial species list from CalWeedMapper was reduced based on proximity to the Base, ecological impacts, and potential vectors for spread. We focused on both abiotic vectors, such as creeks or roads, and biotic vectors such as cattle brought onto the base for grazing. Military personnel and vehicles driven onto base for training or construction activities are also a major potential vector for invasive plants.

Bridal veil broom invades Fallbrook Naval Weapons Station and may be more widespread than reported. Photo by gardensandplants.com.

The Quino checkerspot butterfly is an endangered species with habitat on Remote Training Site Warner Springs. Photo by San Diego Natural History Museum.

Camp Pendleton has nearly eradicated arundo from the base. Photo by Camp Pendleton.

Regional Coordination

Working at a regional scale with multiple partners is important for combating invasive plants. Military bases work with adjacent state, federal, and local agencies.

This project connects to Cal-IPC's other projects on landscape-level regional planning, where for the past two years we've been meeting with multi-county groups to decide on regional priorities and develop funding proposal. We are also working with State Parks on Early Detection guides. Land managers from Camp Pendleton and Fallbrook attended an Early Detection meeting with the San Diego District of State Parks.

Fort Hunter Liggett conducted a yellow starthistle demonstration project with local landowners. Photo by Rob Pike, Fort Hunter Liggett.

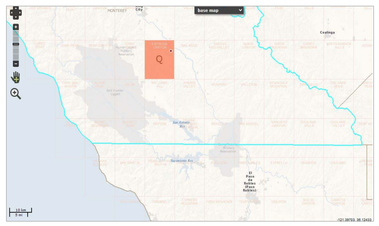
One goal of this project is to develop a list of regional priorities, where bases and nearby agencies can work together to improve overall effectiveness. Bases may be able to provide funding to other organizations if the work will benefit the base's needs. Other organizations, such as Resource Conservation Districts, may serve as contacts with local landowners to encourage them to remove weed populations adjacent to bases.

We engaged a wide range of partner organizations in meetings with base staff, including:

Federal: Bureau of Land Management, Cleveland National Forest,

State: California Dept. of Fish and Wildlife, California State Parks, California Army National Guard, CalTrans, UC Cooperative Extension

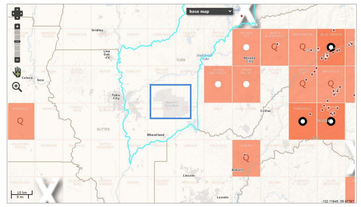
Local: County Agriculture (Yuba, Monterey, San Diego), Monterey County Parks, Southern Monterey County Rural Coalition, Friends of Spenceville Wildlife Area, Sutter RCD, Cachuma RCD, Mission RCD, Center for Natural Lands Management, San Elijo Lagoon Conservancy, Vista Irrigation District



Fort Hunter Liggett: *Dittrichia graveolens* (stinkwort) is present at nearby National Guard bases. After the regional partners meeting, it was found on a tank trail leading from FHL to these bases thanks to staff from the two bases searching for it together. Photo by Bob Case.

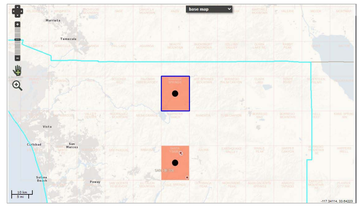
Example Recommendations

We are providing recommendations for the base and recommendations for the base to work on with regional partners. Several of the bases do not currently have map their invasive plant infestations. We recommend that they start a program in order to track populations, identify vectors that could spread them (such as nearby roads), and communicate with off-base partners about actions to work on together.

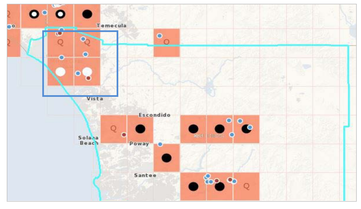


Beale AFB (gray in dark blue square): *Centaurea stoebe* ssp. *micranthos* (spotted knapweed) is not yet in Yuba County but is spreading in neighboring Nevada County. Beale, the county, and other regional partners can put this on their early detection list. Photo by Bob Case.

Vandenberg AFB (gray in dark blue square): *Brassica tournefortii* (Saharan mustard) was eradicated from the base but was recently found again. It is not very widespread in Santa Barbara County and could be an eradication target. Photo by Jim Andre.

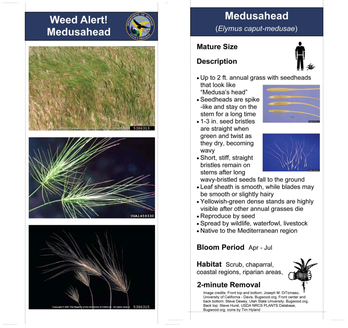


Warner Springs (in the quad with the blue rectangle): *Elymus caput-medusae* (= *Taeniatherum caput-medusae*, medusahead) is not common in San Diego County and is a Very High Priority species on the Management Strategic Plan Invasive Plant List for the San Diego Management and Monitoring Program. It can covert chaparral to grassland, which is a concern on RTS Warner Springs. Removing this species will provide a benefit at a county-wide scale. Photo by Zoya Akulova.



Camp Pendleton and Fallbrook Naval Weapons Station (dark blue square): *Spartium junceum* (Spanish broom) is present in small populations on the base and in neighboring Cleveland National Forest. Camp Pendleton may be able to provide a contractor to work on populations in the forest, benefiting the base by preventing spread. Photo by Karen Suarez.

Next Steps

We are preparing recommendations for each base, listing species for control on the base and species that could be the subject of coordination with regional partners. Each base will also receive surveillance guides for several species. These guides can be provided to biologists conducting surveys on base, maintenance crews, or hunters to encourage reporting of high-priority species.

We hope to expand this project to additional bases. As part of this project, we developed guidelines for transferring our approach to other locations, which could include bases outside of California.