

Western Ecological Research Center <http://www.werc.usgs.gov>

## Invasive Species Studies in the Pacific Southwest

The Pacific Southwest—California, Nevada, Utah, and Arizona—is characterized by remarkable biodiversity in an unparalleled range of environments. Some native plants and animals are found nowhere else in the world. But the region’s biodiversity and the continued survival of functioning native ecosystems are threatened by the invasion of nonnative species. Once established, some invasive species have the ability to displace or replace native plant and animal species, disrupt nutrient and fire cycles, and cause changes in the pattern of plant succession. The invasive plant saltcedar has the additional notoriety of siphoning off millions of acre-feet of water from our aquifers.

Under the USGS “Weeds in the West” initiative of 1998, the Western Ecological Research Center (WERC) began research that will improve the ability to detect, monitor, and predict the effects of invasive species. The projects address critical needs in California’s Central Valley, the Mojave and Sonoran deserts, selected national parks, and other sensitive areas in California and Arizona. This research will provide resource managers with the information and tools needed to better understand and control invasive weeds on the land they manage and to help them avoid or prevent future invasions.

Ongoing and recent studies include: the distribution and impact of perennial pepperweed on Central Valley national wildlife refuges; the roles of cattle grazing and off-highway vehicles on the spread of invasive plants



Tortoise-eye view of less nutritious, fire-threatening, invasive grass. Photo: desert tortoise trail through dried red brome, by C. Schwalbe.

### Research is still needed for:

- Understanding mechanisms or conditions that promote the spread of invasives
- Predicting the invasiveness of nonnative species
- Better understanding of the proximate and ultimate impacts of invasive species on native plants and animals
- Finding better ways to control the establishment and spread of nonnatives

in the Mojave Desert; how red brome out-competes native plants in the Mojave, how increased fire frequency from the spread of nonnative plants in the Mojave and Sonoran deserts is affecting native animals and plants such as the desert tortoise and saguaro cactus; how the abundance of nonnative food plants is affecting reproduction in desert tortoises; how land disturbance influences the distribution of nonnative riparian plants along Redwood Creek; whether cattle grazing and prescribed fire can be used to reduce and control the spread of invasive plants; and the distribution, abundance, and ecology of nonnative plants in the Sierra Nevada national parks, in southern Arizona national parks, and in Channel Islands National Park.

Equally important research is being conducted by WERC scientists on exotic animals. Studies include: the biology of bullfrogs in California and in Arizona and their impacts as predators of rare native species; the effects of cattle grazing on the desert tortoise and its habitat; testing whether a parasitic barnacle can be used as an agent to control the European green crab without risk to native species; the ecology of feral burros in and around Death Valley National Park; and the ecological impacts of the African clawed frog in southern California.

### For more information, contact:

USGS Western Ecological Research Center  
7801 Folsom Blvd., Suite 101  
Sacramento, CA 95826  
Phone: 916.379.3740 Fax: 916.379.3765