

California Alliance for Tamarisk Biocontrol

Biological Control with the Tamarisk Leaf Beetle *Diorhabda* spp.

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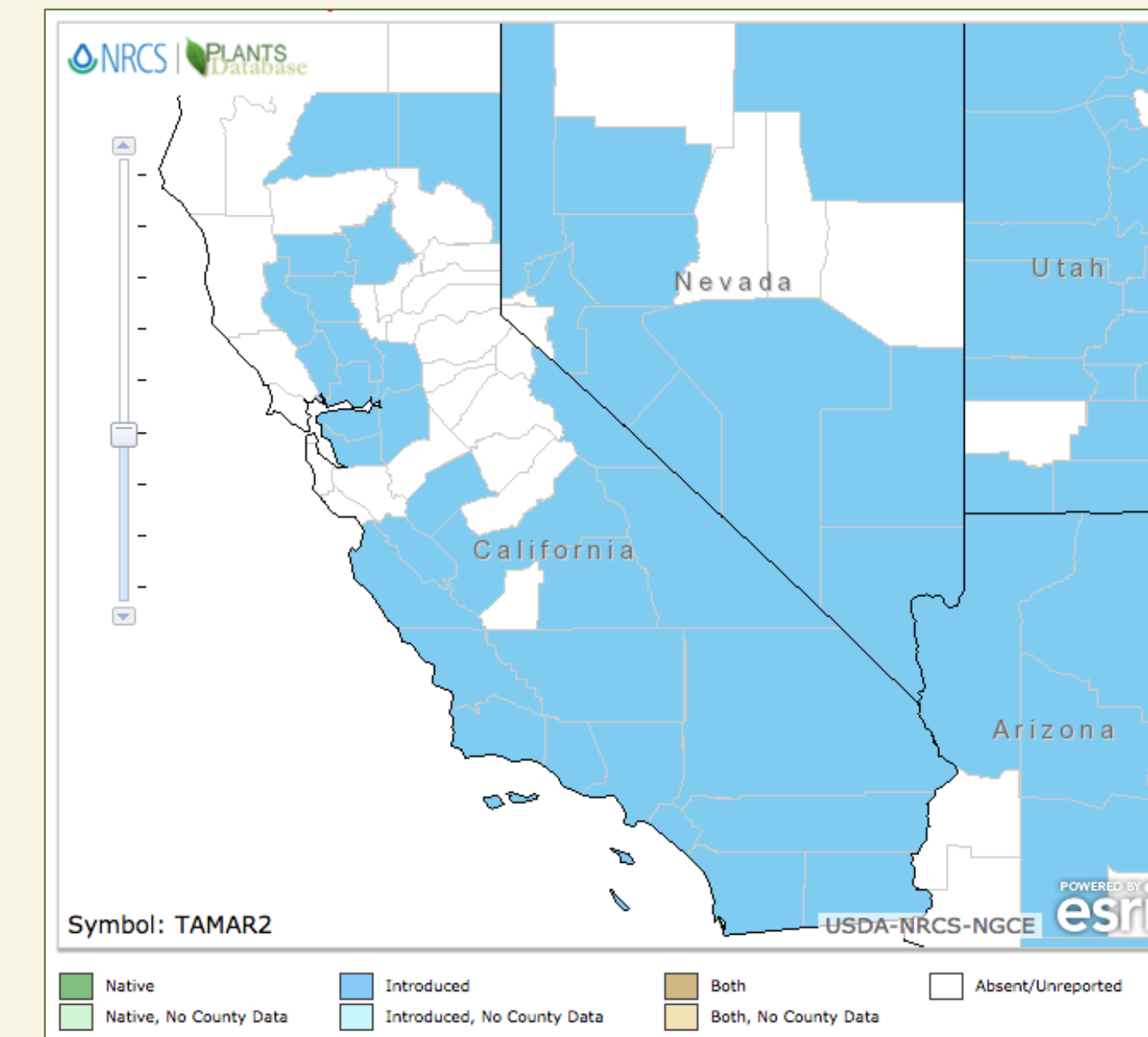
The **California Alliance for Tamarisk Biocontrol** was formed with support from Cal-EPA to provide education and resources on the biocontrol of tamarisk, implement new beetle releases in areas where biocontrol would be useful, and monitor movements of *Diorhabda* and ecosystem responses in California.

Biological Control, or Biocontrol, is the importation of specialist organisms, usually insects, that feed **ONLY** on the target plant, with intent to suppress the weeds and allow native or desired plants to recover along with associated wildlife.

The Alliance assists local agencies and organizations who are interested in participating in biocontrol of tamarisk by providing resources, such as public outreach materials. The Alliance has also created management and monitoring protocols for tamarisk biocontrol and provides resources and guidance on relevant ecosystem restoration methods to enhance recovery of native riparian ecosystems across the state.

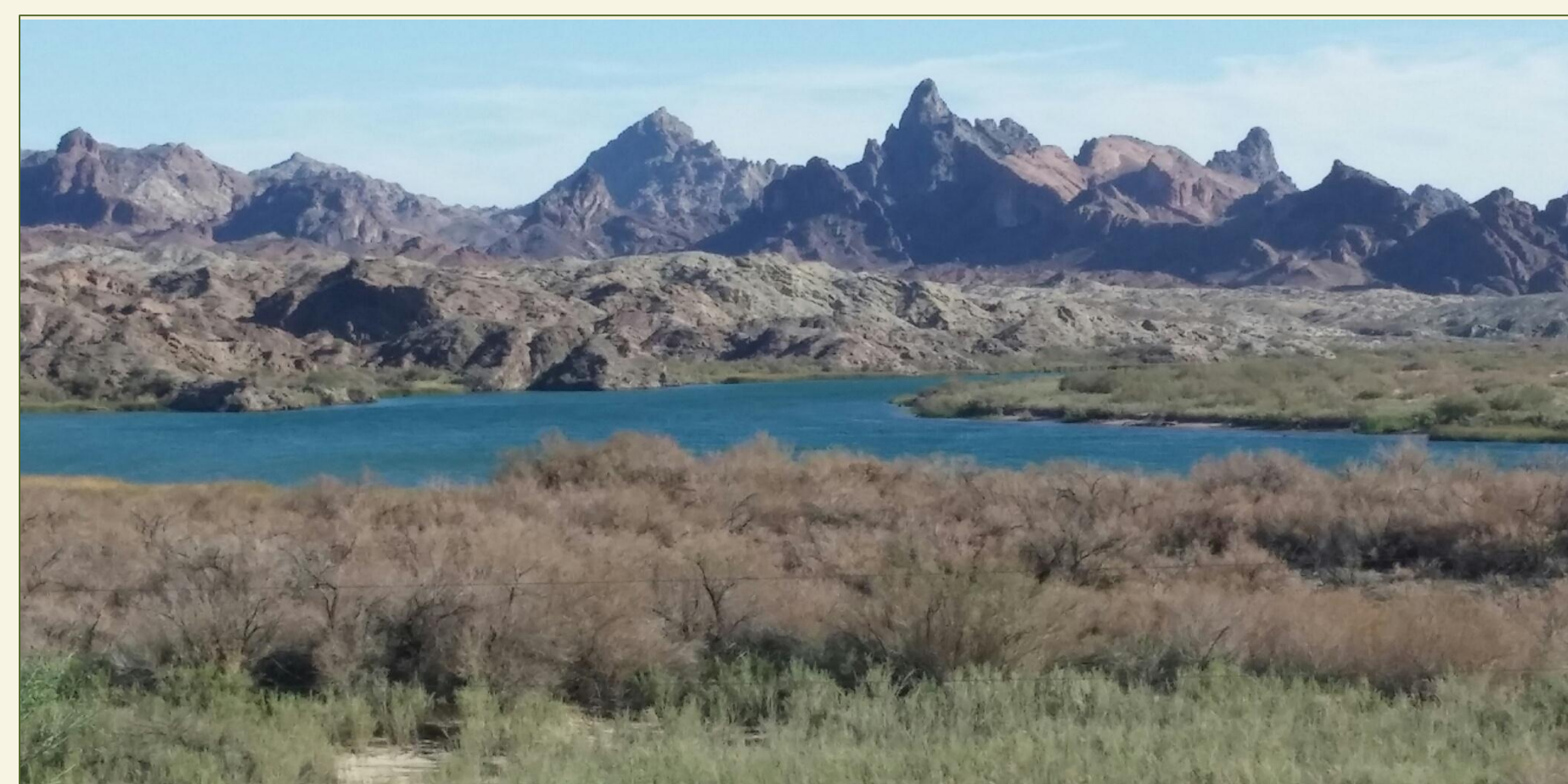
The Alliance includes members from state and federal agencies, regional resource management groups, conservation organizations, and researchers with experience in biocontrol, invasive species management, endangered species protection, and ecosystem restoration.

Tamarix distribution in California and surrounding states



Tamarisk Impacts

- Can displace native trees like cottonwood, willow, mesquites
- Poor habitat for wildlife
- Poor forage for livestock
- Increases erosion
- Restricts recreation access
- Increases soil salinity
- Promotes fire, **even if green** (and tamarisk grows right back)



Tamarisk defoliation along the Colorado River in Needles, CA



Bruce Kenyon (Quail Unlimited) and Alliance Partner Mike Pitcairn (CDFA) in front of beetle defoliation at Camp Cady along the Mojave River.

Sticky trap with male-derived aggregation pheromone for *Diorhabda*. These traps serve as sentinel markers to detect new colonization as the beetles move throughout a region.

The pheromones alone can help keep populations of beetles in the same area for better establishment with a small number of beetles.



Tamarisk defoliation along the Virgin River

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Tamarisk Leaf Beetles

The **tamarisk leaf beetle (*Diorhabda carinulata*)** was introduced to the U.S. from Asia in 2001, after scientists conducted over 10 years of testing to ensure the beetle would be effective and not feed on other plants. Larvae and adults feed by scraping the tamarisk foliage, causing it to dry out.

This beetle is now present along the Colorado River on the California border, and in the Owens Valley and the Mojave River. Three other *Diorhabda* species were later released in North America, one of which, *Diorhabda elongata* (Mediterranean), is present in northern California.



Diorhabda carinulata adult and larva.

Ecosystem Responses

When tamarisk is defoliated, water loss to the atmosphere is halted and instead is retained in the groundwater. Annual water savings over 65% have been measured. Tamarisk initially re-grows after defoliation, but gradually dies back and in 2 to 4 years some plants may be killed. Thus tamarisk is not eradicated, but it is suppressed, allowing space for native riparian plants like willows and cottonwoods to re-colonize the ecosystem. This process can be slow where years of environmental degradation makes recovery difficult, but active re-vegetation is being applied to jump-start the process.

While temporary disruption of nesting IS possible, researchers from universities and public agencies closely monitor biocontrol agents and ecosystem responses including wildlife and native plants, water savings, soils and hydrology, and fire risk. It is also key to test **restoration** methods to jump-start native plant recovery, and create conditions that favor a return to the natural ecosystem.

If you are interested in participating in management of tamarisk in California, please contact us at TamariskAllianceCA@gmail.com

Alliance Partners

CA Environmental Protection Agency – Doug Downie
CA Department of Food and Agriculture – Mike Pitcairn
CA Department of Fish and Wildlife – Joel Trumbo
UC Co-op Extension – Chris McDonald and Carl Bell
CA Native Plant Society – Dan Gluesenkamp
Tijuana River National Estuarine Reserve – Jeff Crooks
USDA Agricultural Research Service – Paul Pratt
U.S. Forest Service – Nicole Molinari
U.S. Bureau of Land Management – Denis Kearns
U.S. Army at Ft. Irwin – Liana Aker
Mojave District Resource Conservation – Ken Lair and Chuck Bell