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Orange Trees in Summer? What's Happening?

Saltcedar & *Diorhabda in NM*

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- Extension Entomologist, NMSU &
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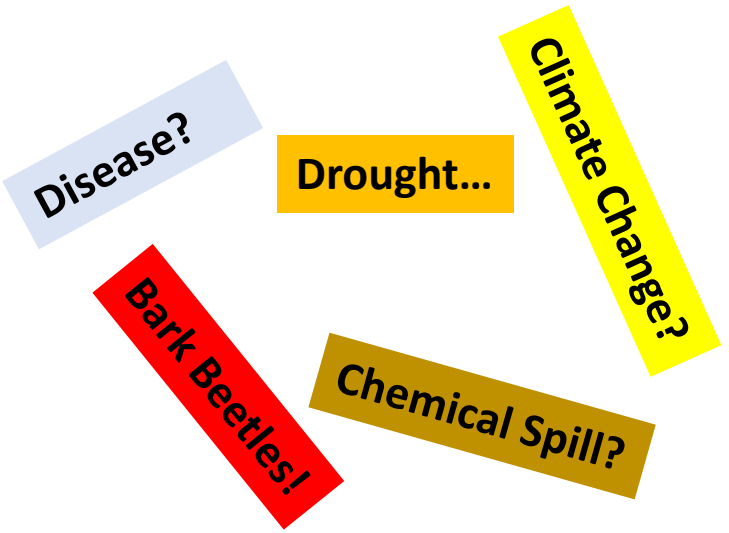
You May Have Noticed This? What Is It?

Sevilleta Exit 169, I-25; July, 2016



Caballo Reservoir, May, 2016

No, It's Saltcedar Under Biological Control by *Diorhabda* Beetles

What? Clarification, please…..

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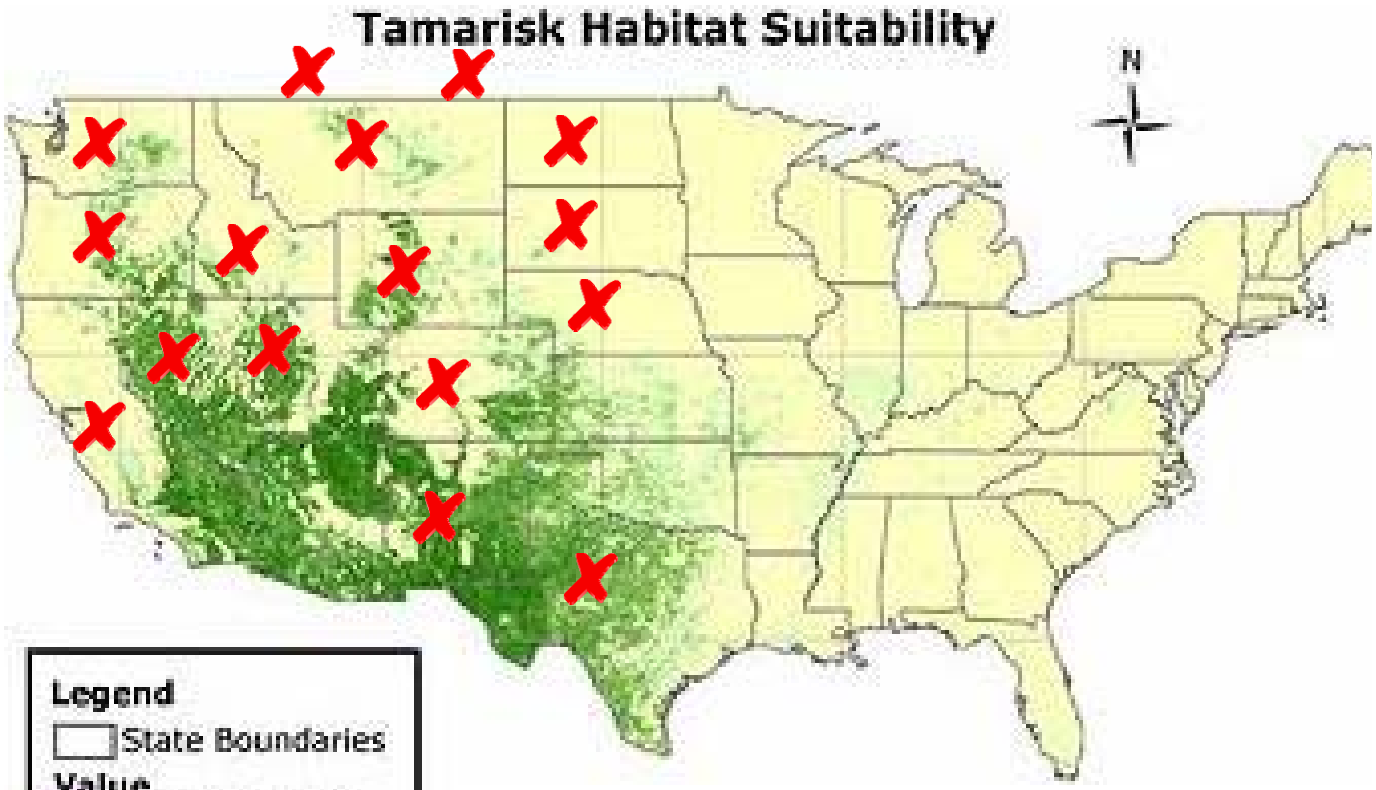
Looking for Saltcedar in the U.S?

Saltcedar = Tamarisk or *Tamarix*
Ornamental? Bank stabilizer? Windbreak?
An 'escaped' invasive, exotic phraeatophyte

Introduced into US in 1800s, 1900s
In arid West, it's a 'noxious weed'
Water waster, habitat changer

Saltcedar is on these Noxious Weed Lists

WA
OR
CA
ID
NV
MT
WY
UT
CO
NM**
ND
SD
NE
TX
Alberta
Saskatchewan



Saltcedar homelands include North Africa, Mediterranean Region, South & East Asia

Until Recently, Land Managers Used These Options for Managing Saltcedar

Fire

Combinations

Heavy Equipment

Drowning

Herbicides

Goats

Biological Control: Another Tool?

- **Premise for Biological Control---** An organism removed from its native habitat and natural enemies may become an exotic, invasive, economically significant pest in a new environment.

- **Advantages**: host specific, no residues in the environment, self-sustaining, mobile, cheap (after its release), may find & control hosts in difficult environments

Are There Any Insects Damaging Saltcedar in New Mexico? Yes, But….

Opsius stactogalus
SC Leafhopper

Coniatus splendidulus
SC Bud Weevil

Chionaspis etrusca
SC Armored Scale

Icerya purchasi
Cottony Cushion Scale

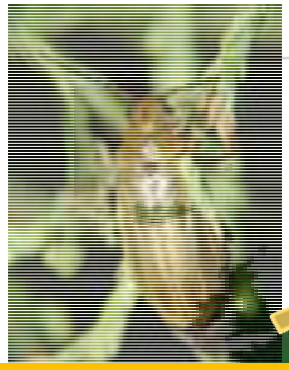
They <u>do</u> feed on saltcedar but usually do little damage to it.

So, situation in the homeland?

All are Exotic Species, Too!

Diorhabda Became Top Biocontrol Candidate!

For years, each *Diorhabda* species was given multiple host specificity tests
It's Saltcedar or Death for them! Very promising as biocontrol!
First limited release permits were issued in 2001-03



Crete-*elongata*

Larger-*carinata*

Fukang/Northern -*carinulata*-

Top candidates For biocontrol

Tunisian-*sublineata*

Another Management Tool!

***Multi-year Project→Dr. Jack DeLoach, (USDA-ARS, Temple, TX) went to saltcedar homelands---case of 'Classical Biological Control'**

Diorhabda Life Cycle

Very Similar for All 4 *Diorhabda* Species

NPS, Dinosaur NatMon 2009

NMSU News

NatParkServ-DinosaurNatMon

3 larval instars, 12-14 days of feeding

NPS, Dinosaur NatMon 2009

Life Cycle in Summer abt. 4 weeks
5-7 generations/year in NM?

NPS, Dinosaur NatMon 2009

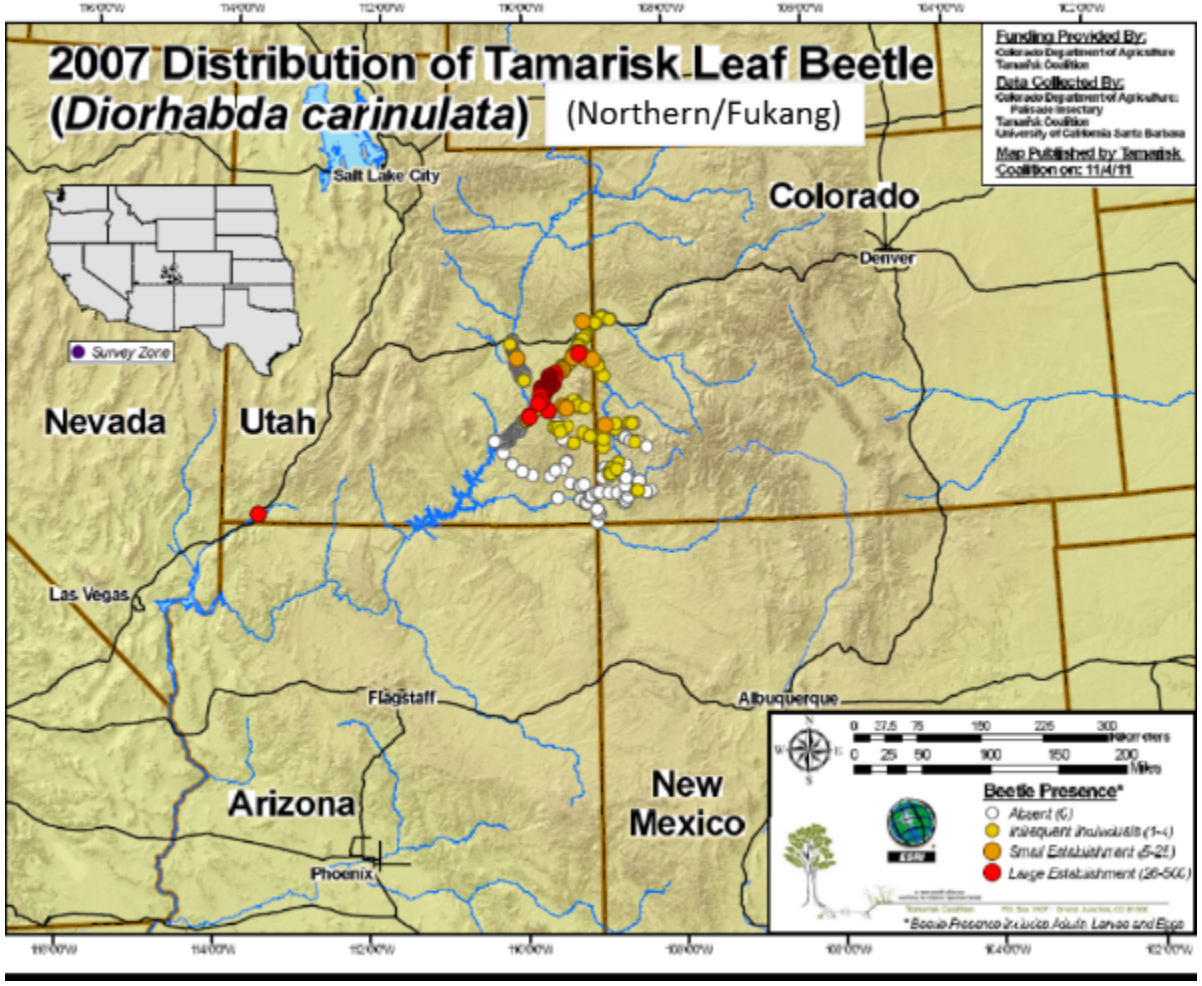
Adult: lives 2-4 weeks
Disperses, reproduces

Pupae may be 'bare' or inside a litter-covered 'cocoon'

First 'Large Scale Releases'(Under Permits) Began in 2005

Tamarisk Coalition started mapping in 2007

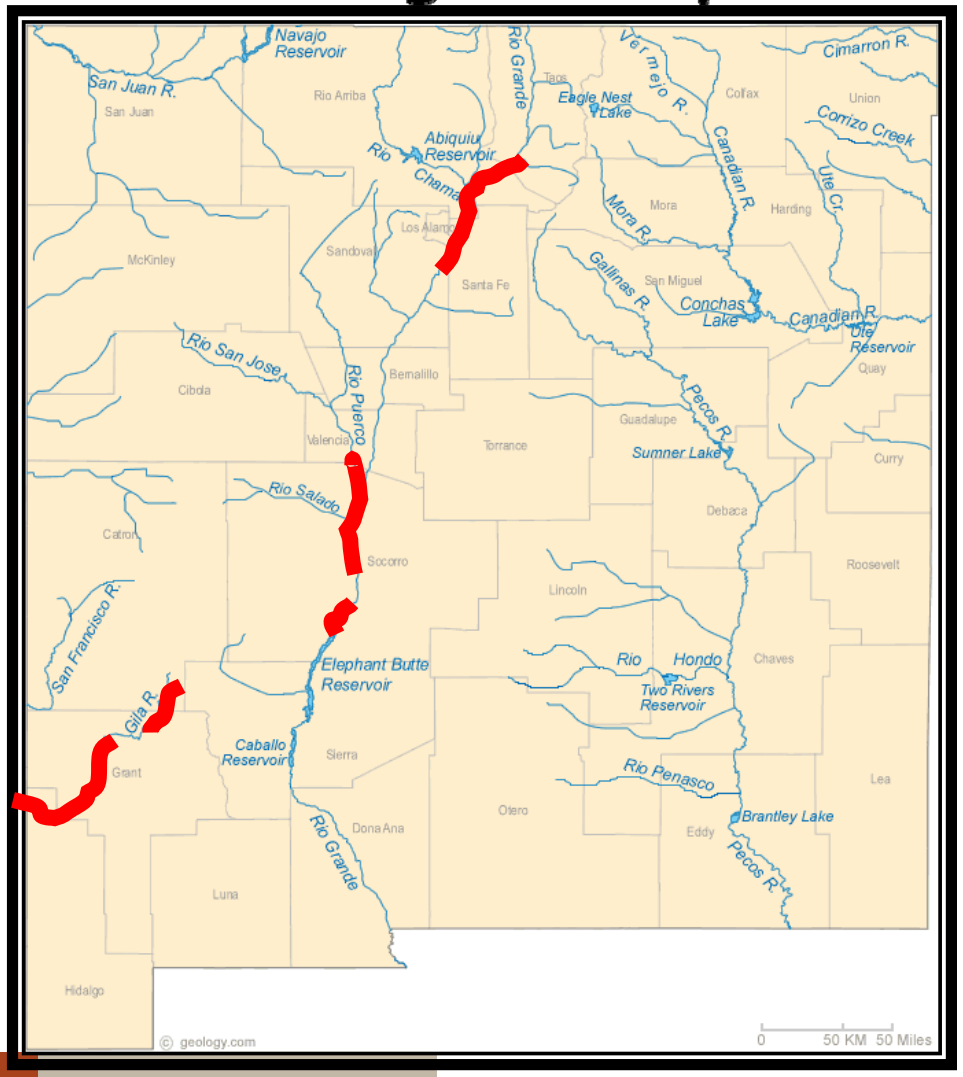
Establishment, reproduction, dispersal began



But There's a Problem:
SW Willow Flycatcher, An Endangered Species

It nests along several rivers in the Southwest, including NM

Concern: beetles defoliate saltcedar during nesting season



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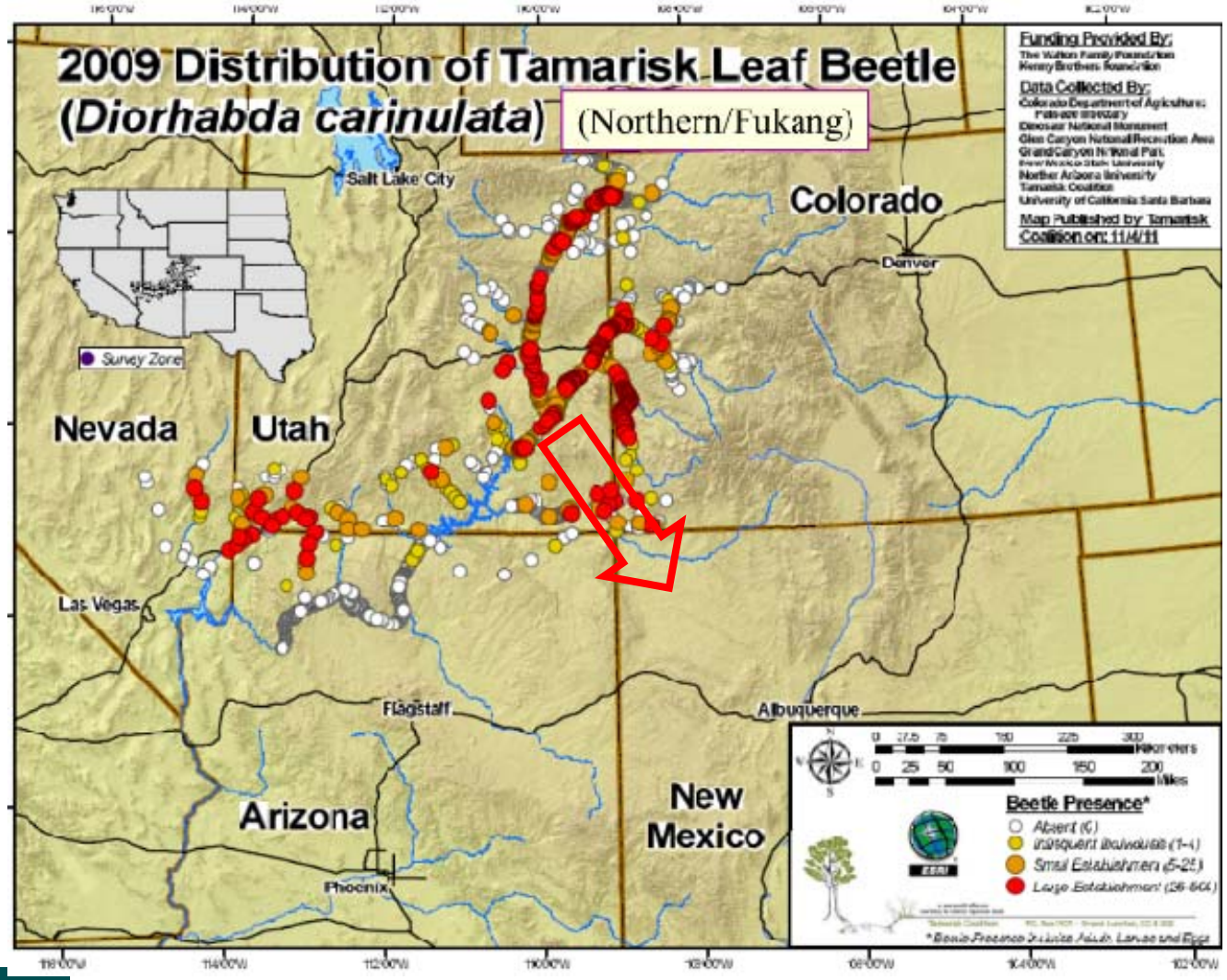
Critical Habitat is Designated by USF&WS

2009: Beetles Established in the Four Corners & Moving!

USF&WS denied release permits for NM

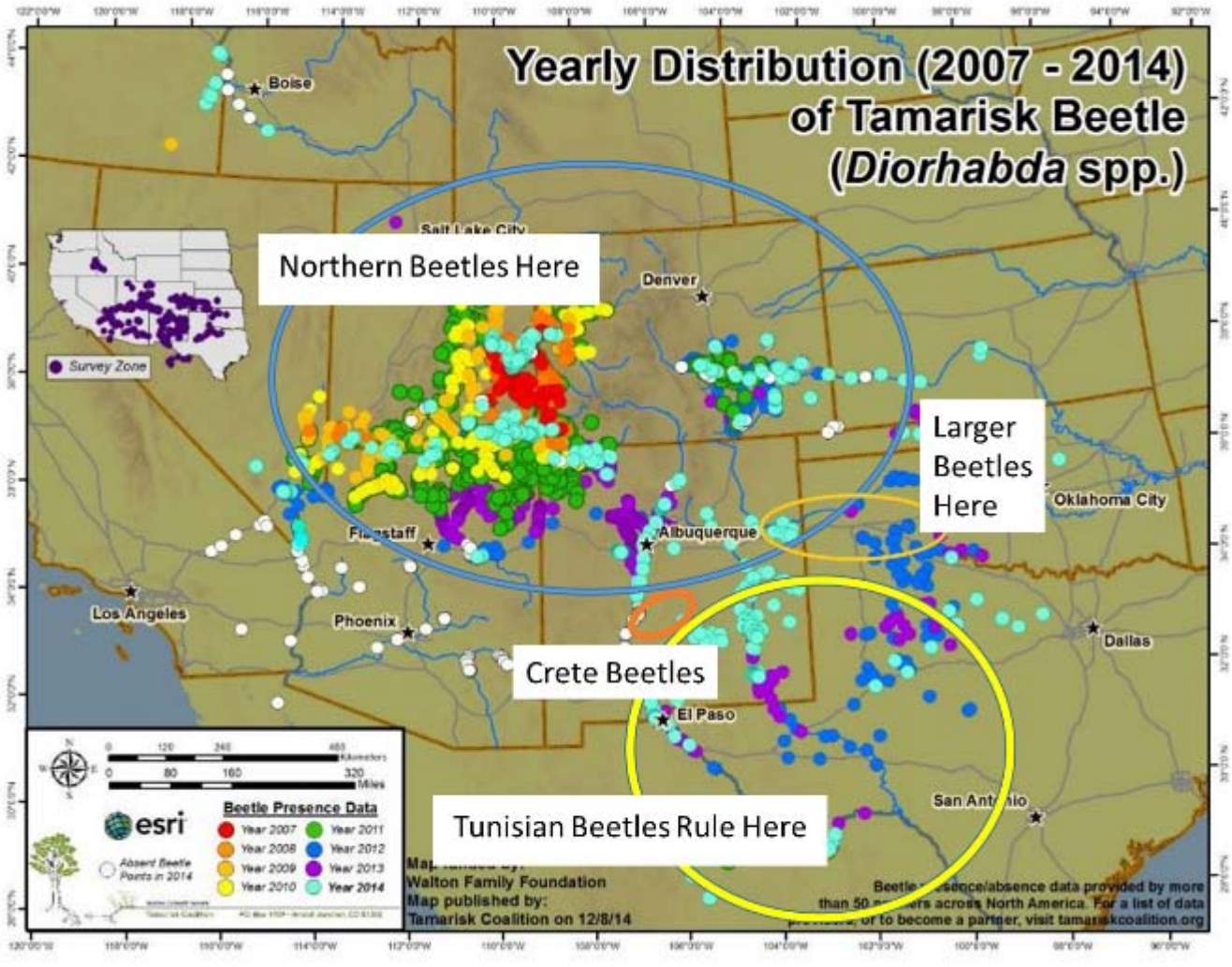
Beetles kept coming by themselves….



Texas Had Robust Beetle Release Program For 3 *Diorhabda* species. All Found NM!

Beetle Monitoring 2014

NM is the FIRST STATE In the US to Have all FOUR SCBs!



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2015: Beetles at Caballo!

This was early August, 2015

Every saltcedar in this stand…..

Photos: Leslie Beck, NMSU

Here's What *Diorhabda* Could Do!

Caballo Reservoir, Sierra Co., 2015……Same tree…….

Objective: SC beetle forages repeatedly, weakening SC, allowing more desirable (with luck & planning) plants to re-establish

August 5, 2015---

And again, September 8, 2015

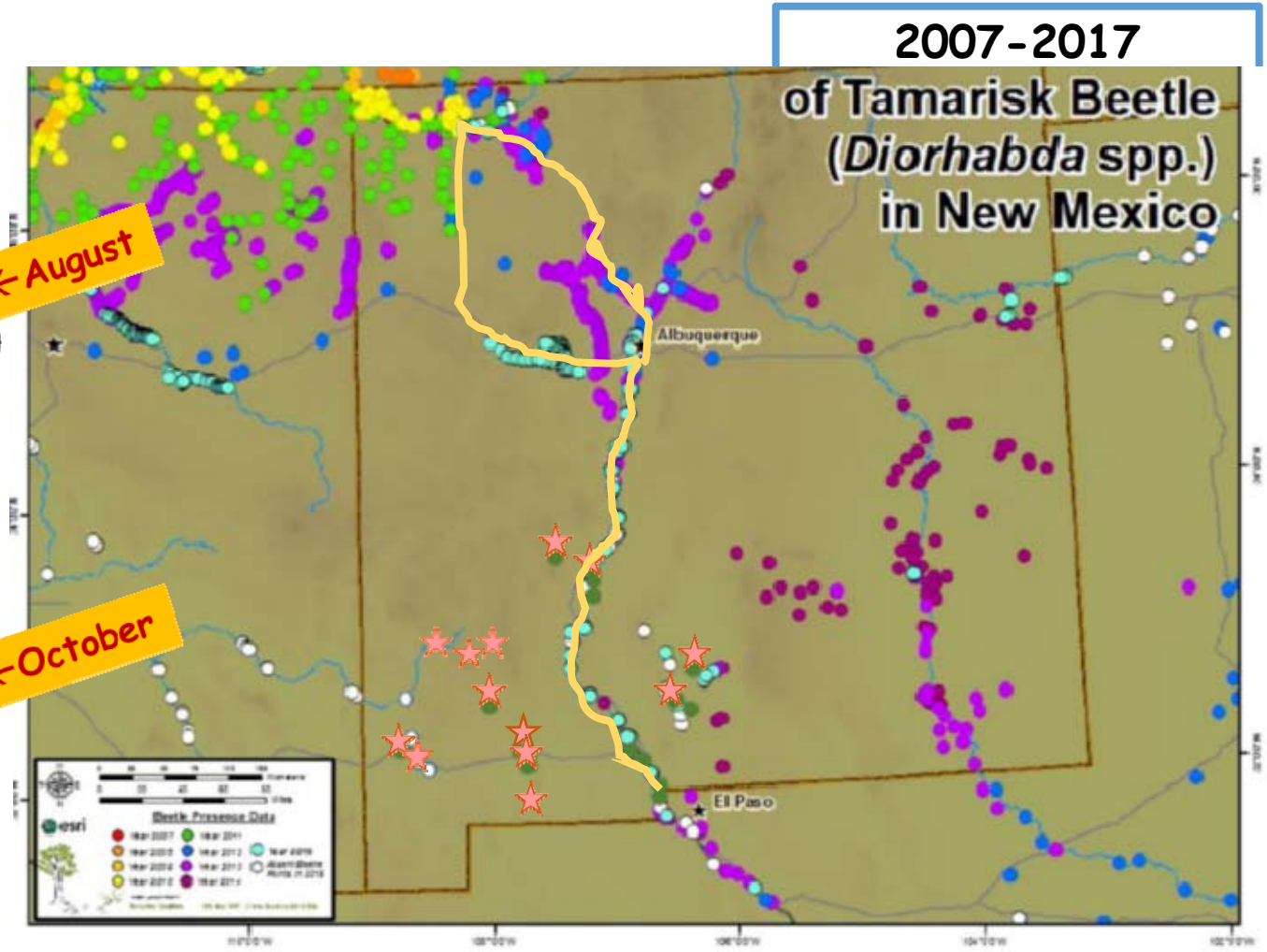
Leslie Beck photos, NMSU

The Latest Map (Incomplete)

Beetles are moving WEST!
Finding scattered stands of saltcedar!

New Finds/Sutherland & Beck, et al.------

---Sierra Co., near Winston (Boone)
---Sierra Co., Elephant Butte (Boone)
---Otero Co., NE Tularosa (Gordon)
---Otero Co., Holloman AFB (w/Mike Freehling, Gordon)
---Dona Ana Co., N&S Las Cruces
---Luna Co., Deming (Blandford)
---Luna Co., Columbus (Vitanza*)
---Luna/Dona Ana, hiway from Columbus to EPTX-Vitanza
---Grant Co., Hiways 180/61 (Pope)
---Hidalgo Co., Lordsburg, '16, '17
Grant Co., Bayard, '17
Grant Co. Gila, '17
Grant Co., nr. City of Rocks, '17



'Issues' Remain for Discussion, Resolution…

Protecting Critical Habitat for SW Willow Flycatcher

Fire Danger

Riparian Areas---Revegetation Projects?

Other Serious, Even Toxic Noxious Weeds 'Waiting in the Wings' (halogeton, Russian Olive, Various Knapweeds, African Rue, Tree of Heaven, Others…..

Questions?

Comments?