

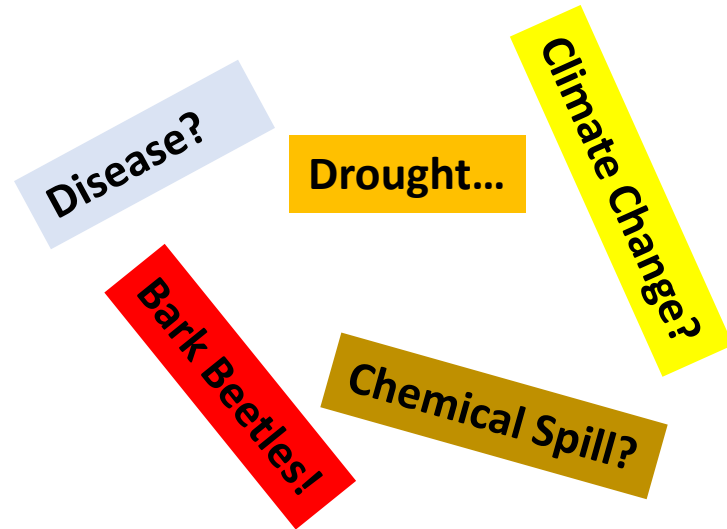
# Orange Trees in Summer? What's Happening? *Saltcedar & *Diorhabda* in NM*

- Dr. Carol Sutherland
- Extension Entomologist, NMSU &
- State Entomologist, NM Dept. Agriculture

# 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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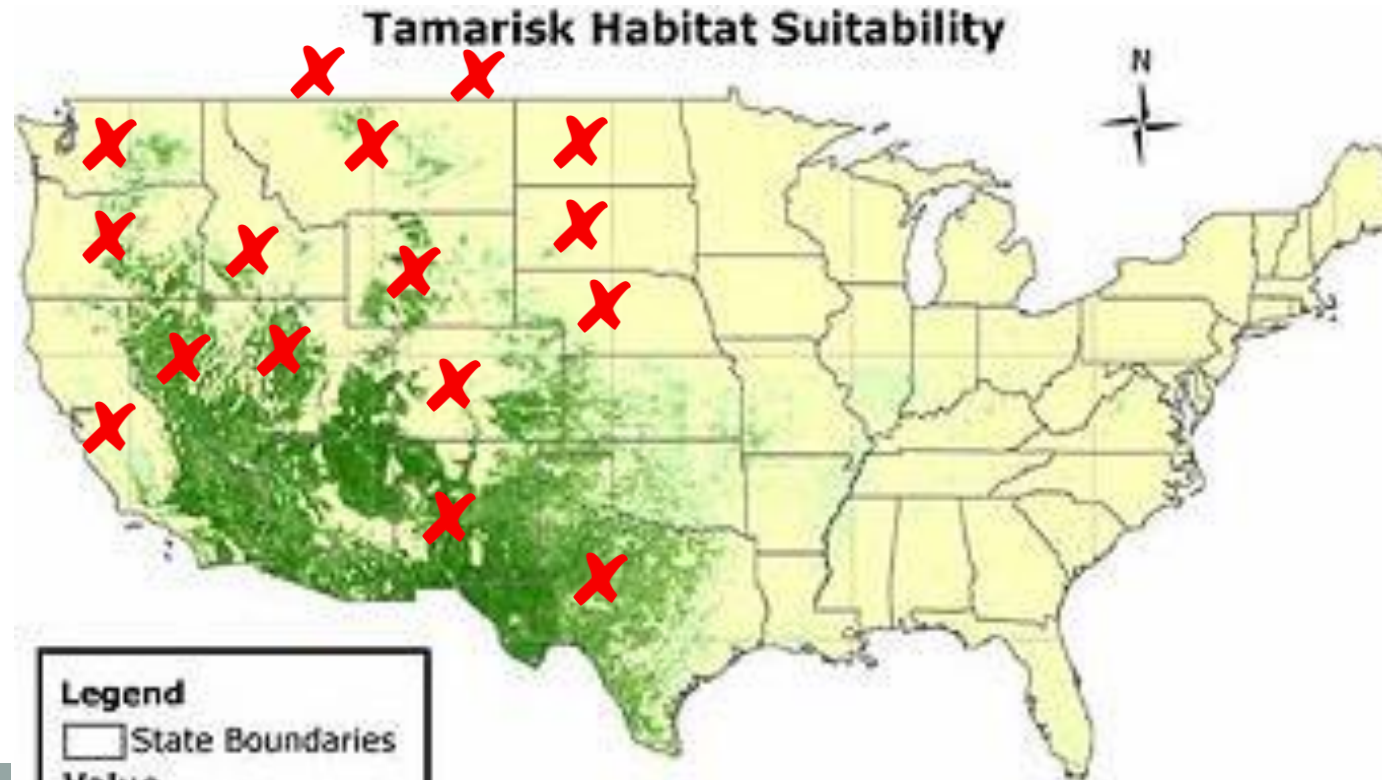
# Looking for Saltcedar in the U.S?

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**



**Heavy Equipment**



**Drowning**



**Combinations**



**Goats**



**Herbicides**



# 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 do 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*



Fukang/Northern  
*-carinulata-*



*Larger-carinata*



*Tunisian-sublineata*

Top candidates  
For biocontrol

Another  
Management  
Tool!



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\*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

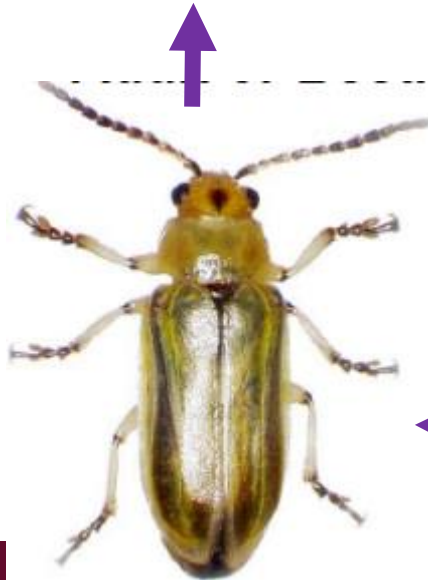


NMSU News



NatParkServ-DinosaurNatMon

3 larval instars, 12-14 days of feeding



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



NPS, Dinosaur NatMon 2009



NPS, Dinosaur NatMon 2009

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

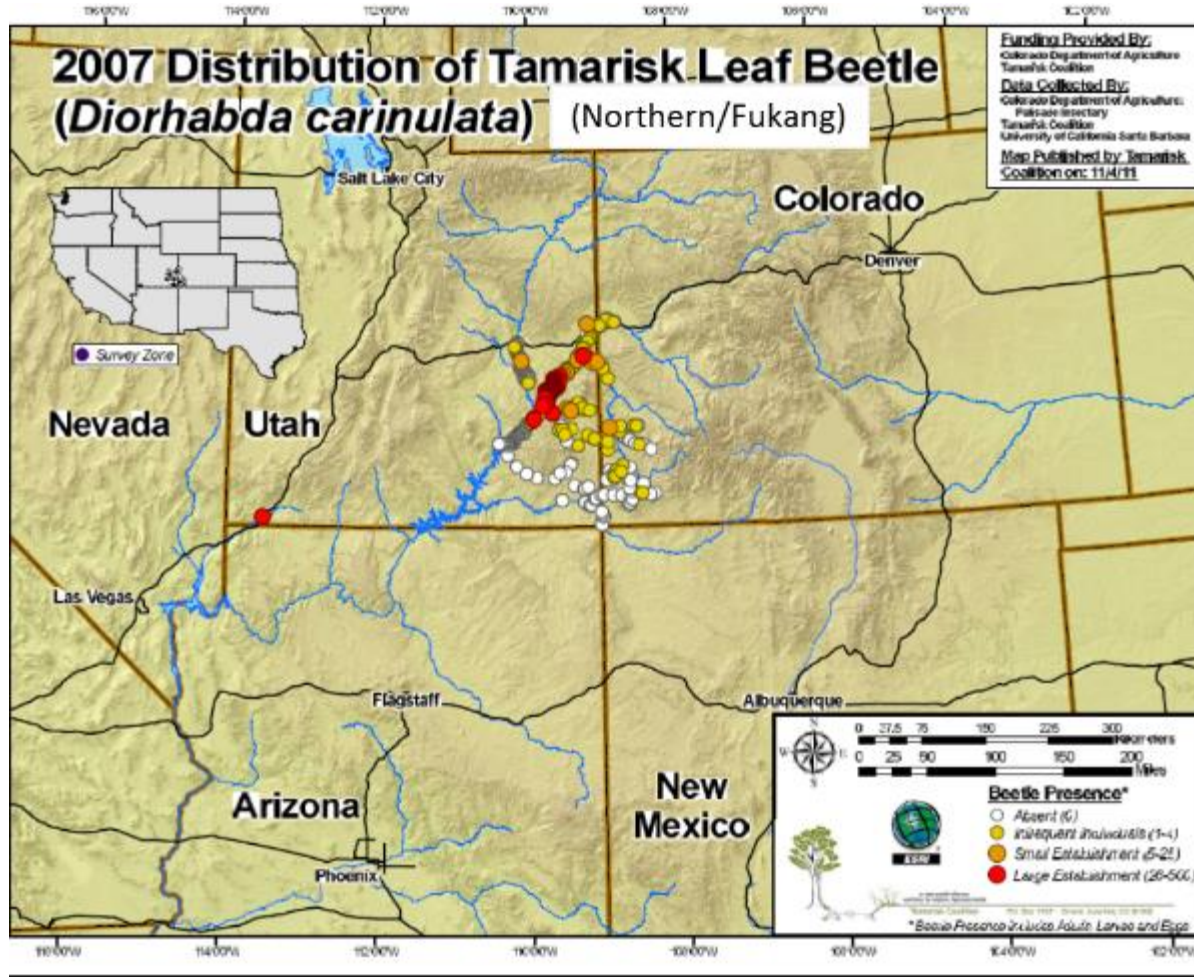
Adult: lives 2-4 weeks  
Disperses, reproduces

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

Tamarisk Coalition  
started mapping  
in 2007

Establishment, reproduction,  
dispersal began



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# 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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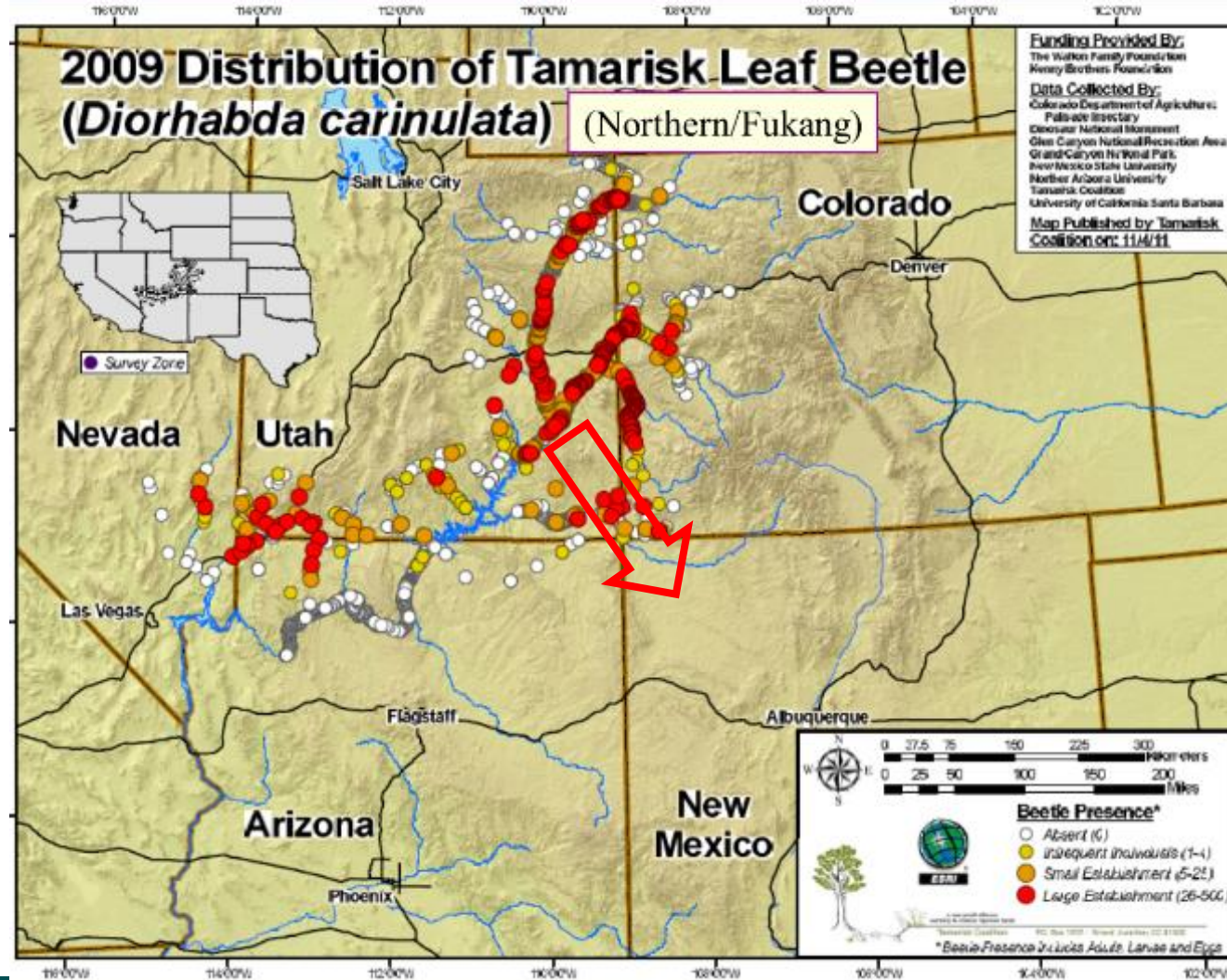
Critical Habitat is Designated  
by USF&WS



# 2009: Beetles Established in the Four Corners & Moving!

USF&WS denied release permits for NM

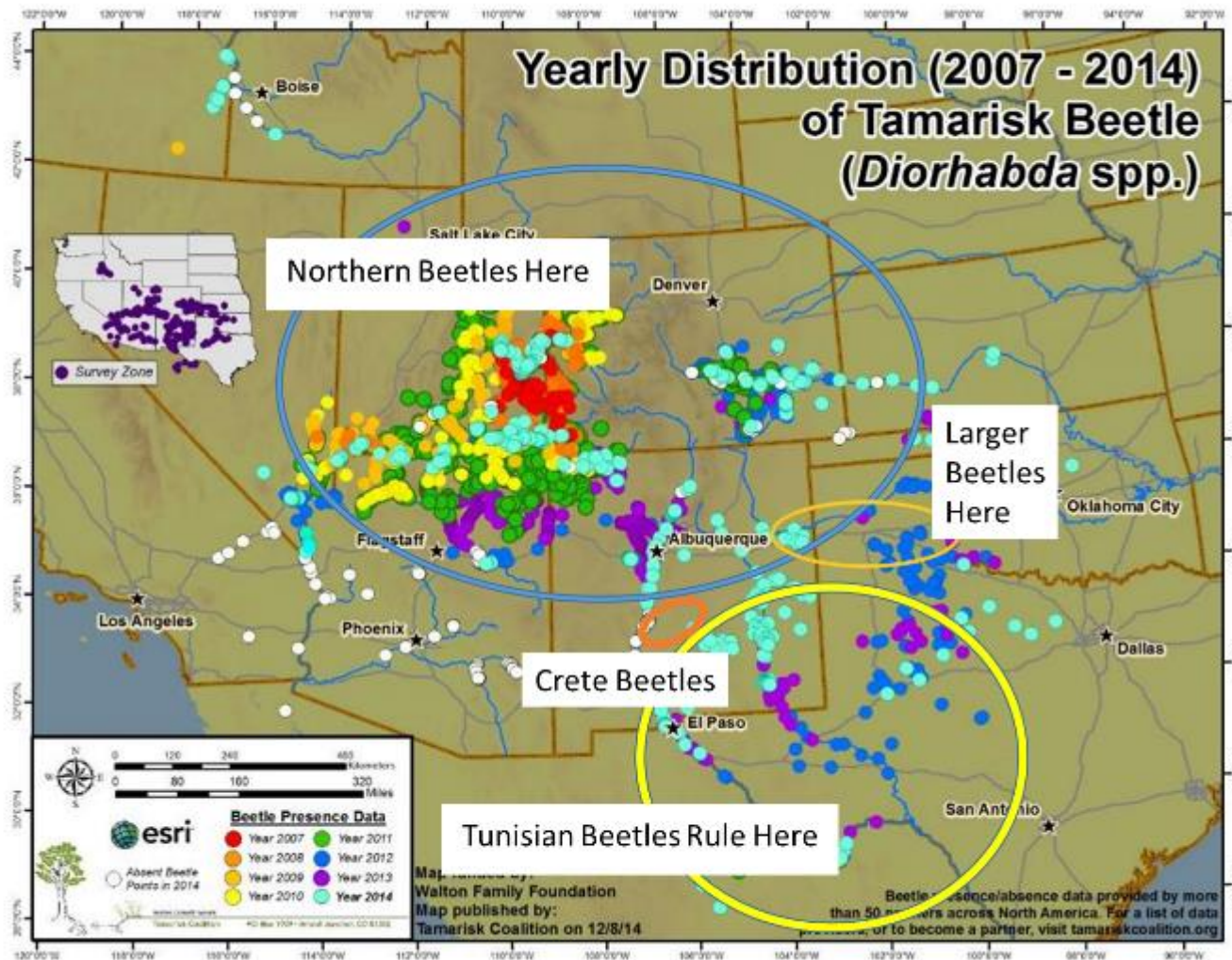
Beetles kept coming by themselves...



# 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!



NM  
STATE

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# 2015: Beetles at Caballo!

Every saltcedar in this stand.....



This was early August, 2015

Photos: Leslie Beck, NMSU

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# 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!

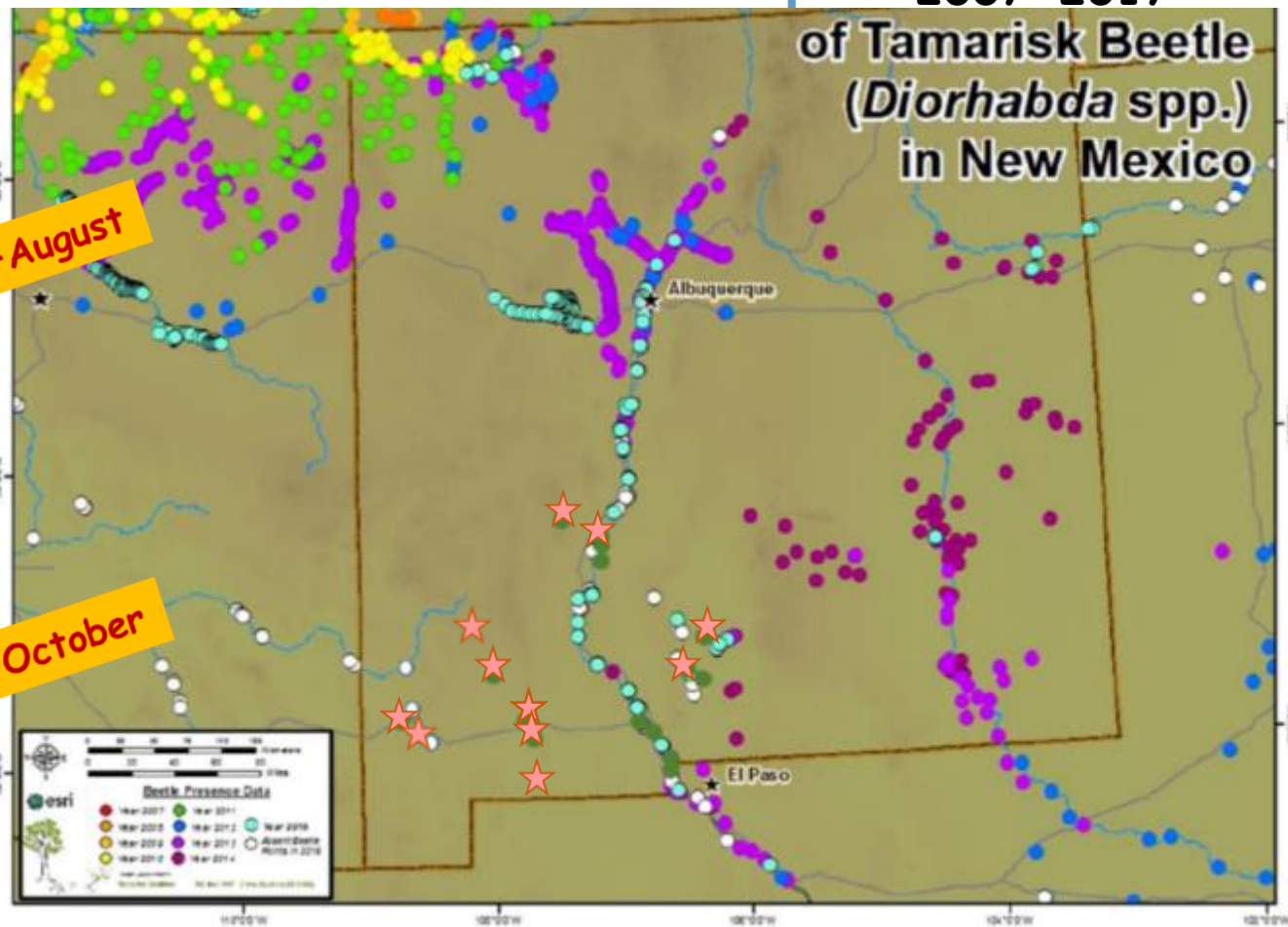
New Finds/Sutherland & Beck,  
et al.-----

2007-2017  
of Tamarisk Beetle  
(*Diorhabda* spp.)  
in New Mexico

- ★ 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

← August

← October



# '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?