

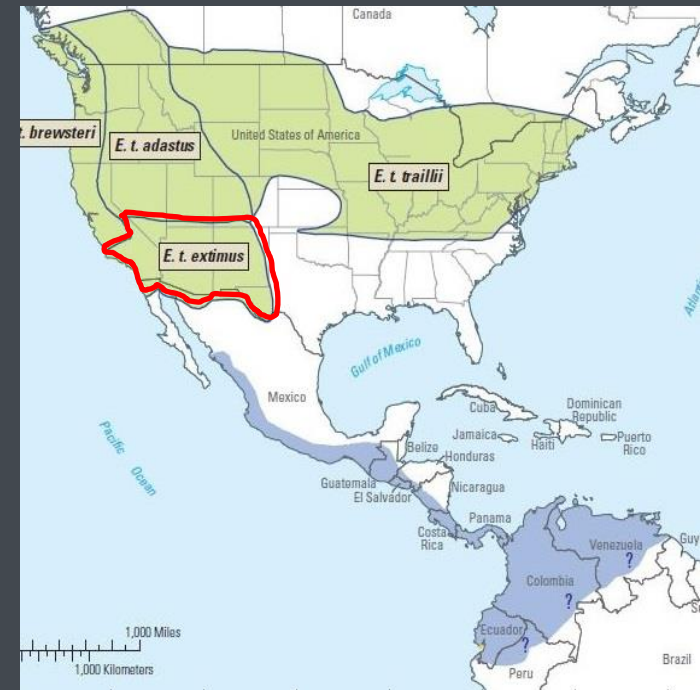


# RESPONSES OF SOUTHWESTERN WILLOW FLYCATCHERS TO TAMARISK DEFOLIATION – AND WHAT TO DO ABOUT IT?

# SOUTHWESTERN WILLOW FLYCATCHER

## (*Empidonax traillii extimus*)

- Endangered subspecies of willow flycatcher
- Breed in AZ, NM, and adjacent portions of neighboring states
- Late migrants; arrive May–June





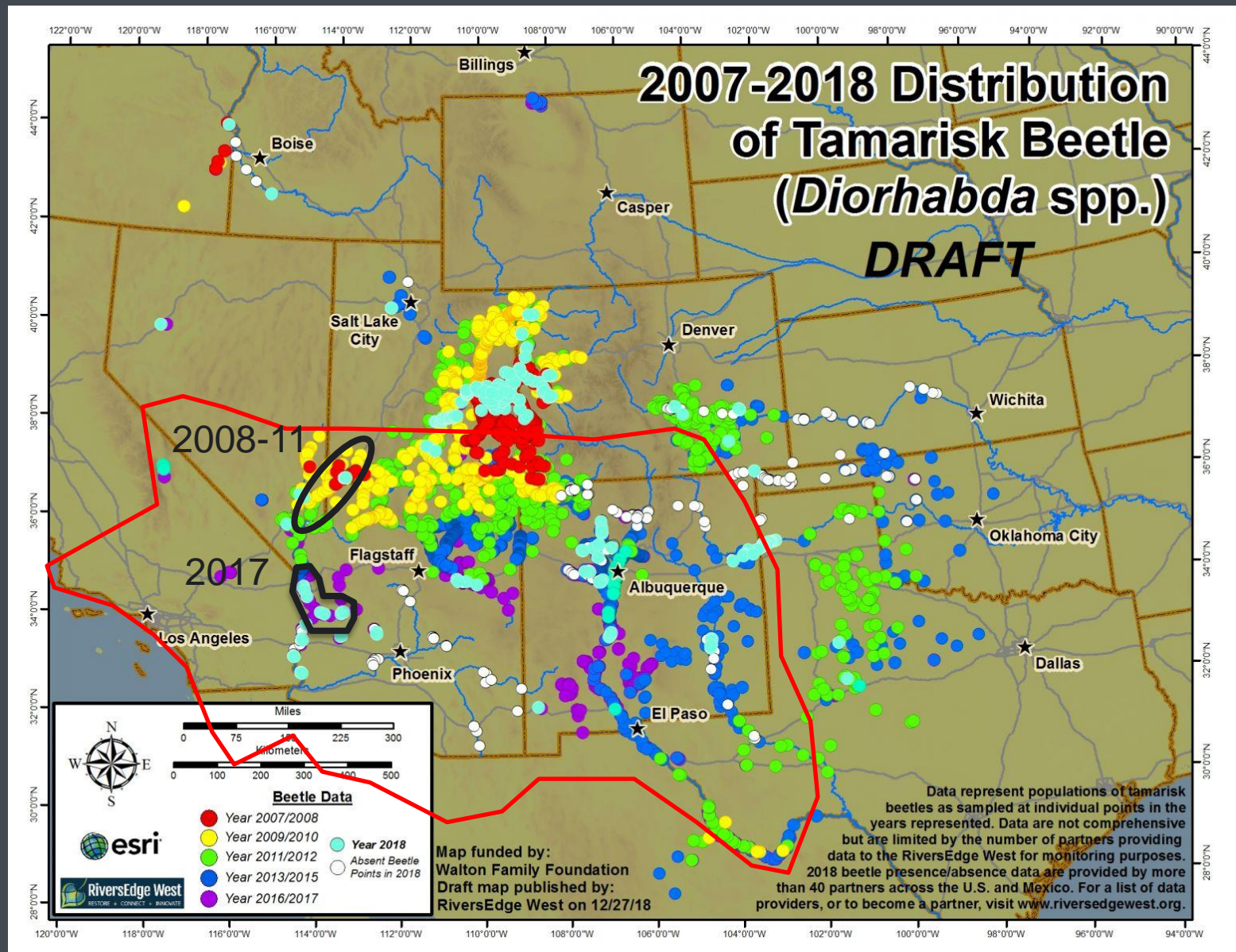
# SOUTHWESTERN WILLOW FLYCATCHER



- Breed in dense, wet riparian habitats; strong affinity for surface water
- Select nest sites that are cool, humid, dense
- Use both native vegetation and tamarisk













Complete defoliation  
Repeated 1-3 times within a season, May-Sept  
Repeated over many consecutive years

Reduced foliage volume  
Partial mortality  
Complete mortality





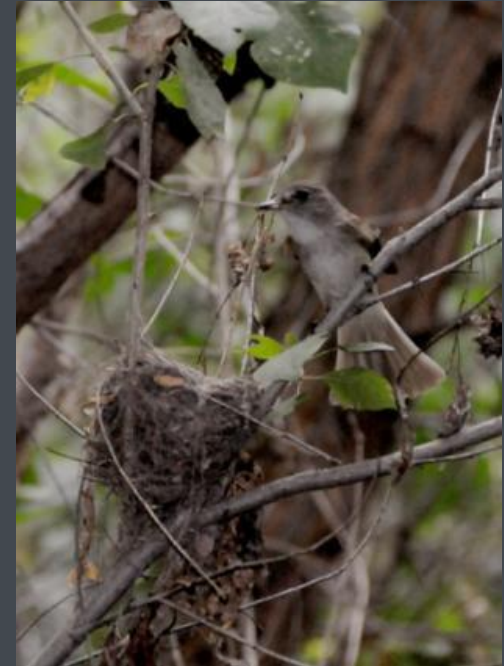
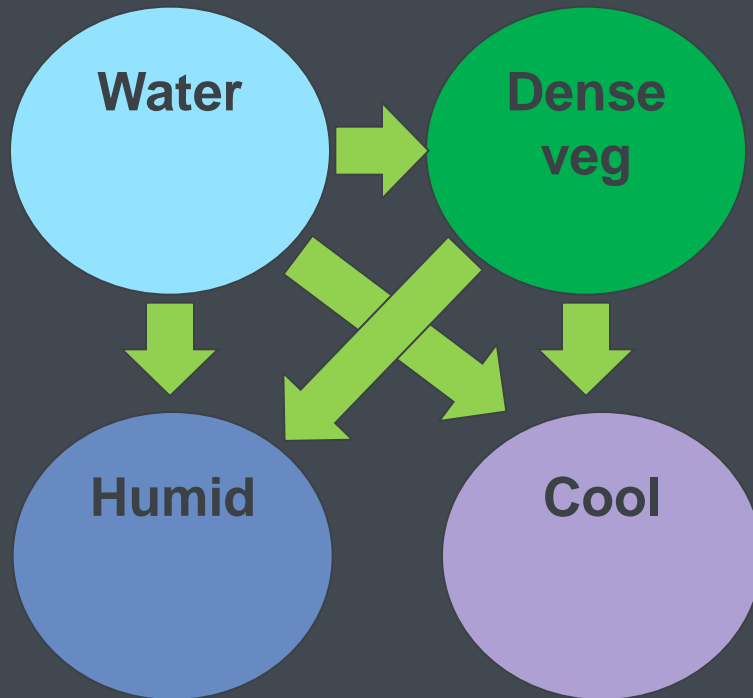








## Flycatcher Habitat Preferences

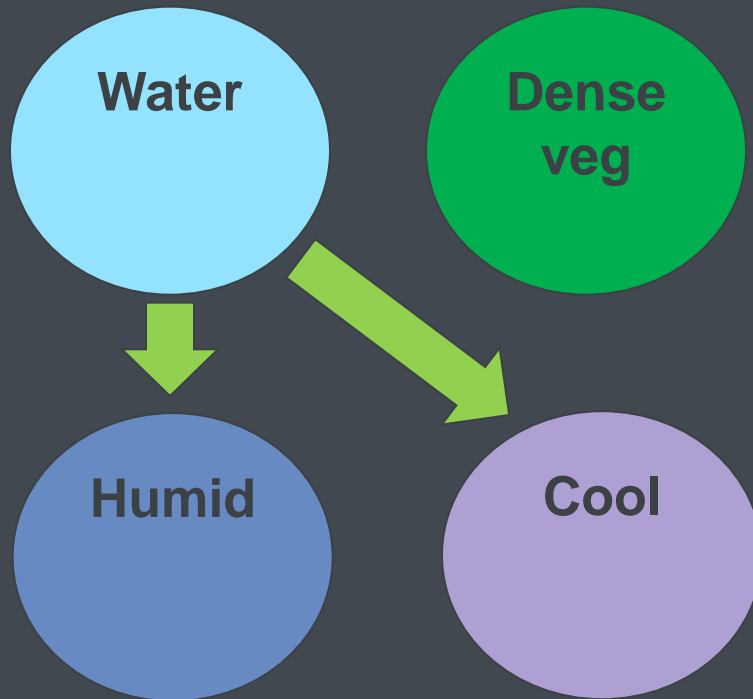


Concealment

Less time & energy on  
thermoregulation

Eggs less likely to reach lethal  
temp (**41°C = 106°F**) Webb 1987

## Flycatcher Habitat Preferences - beetle effects

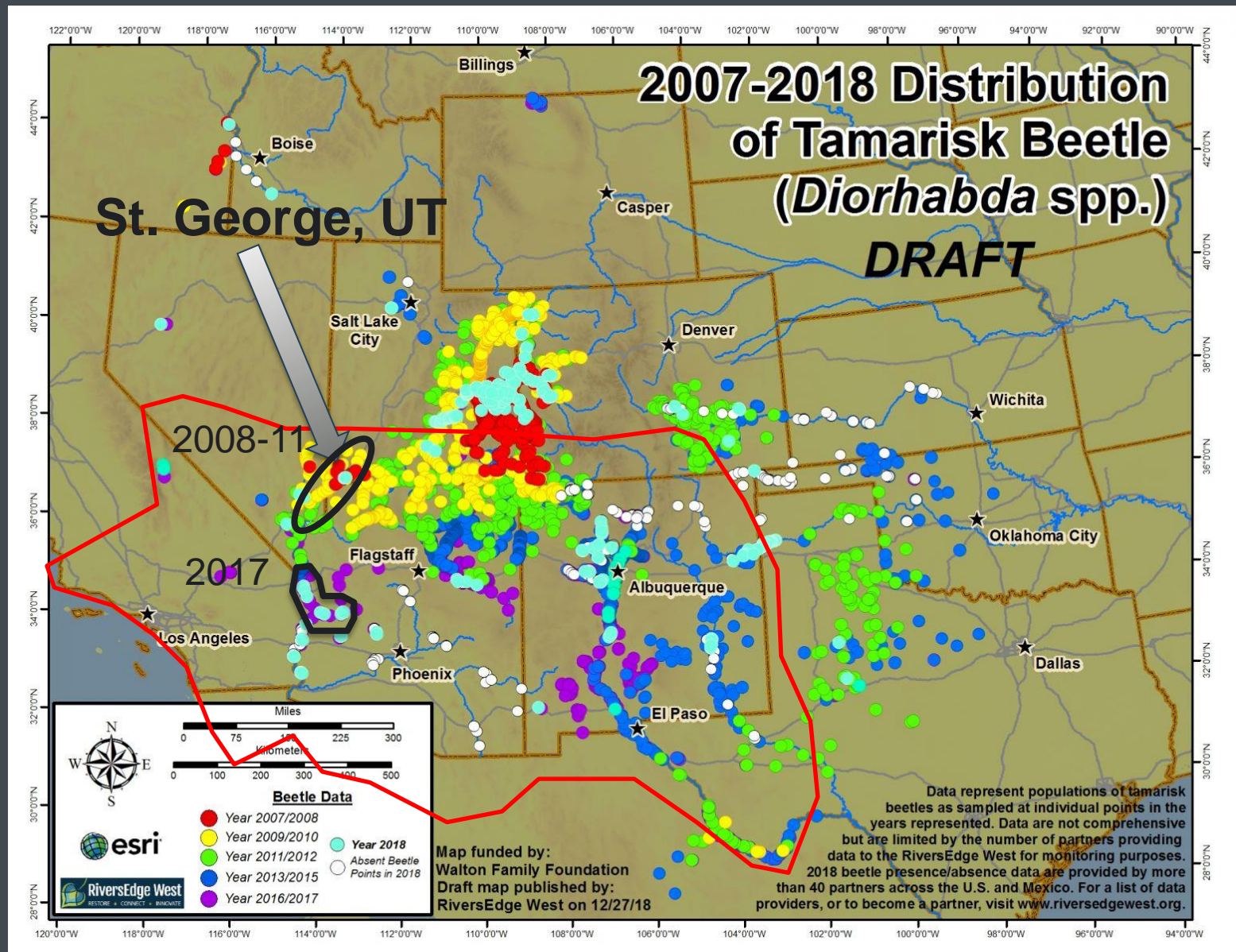


**Increased visibility**

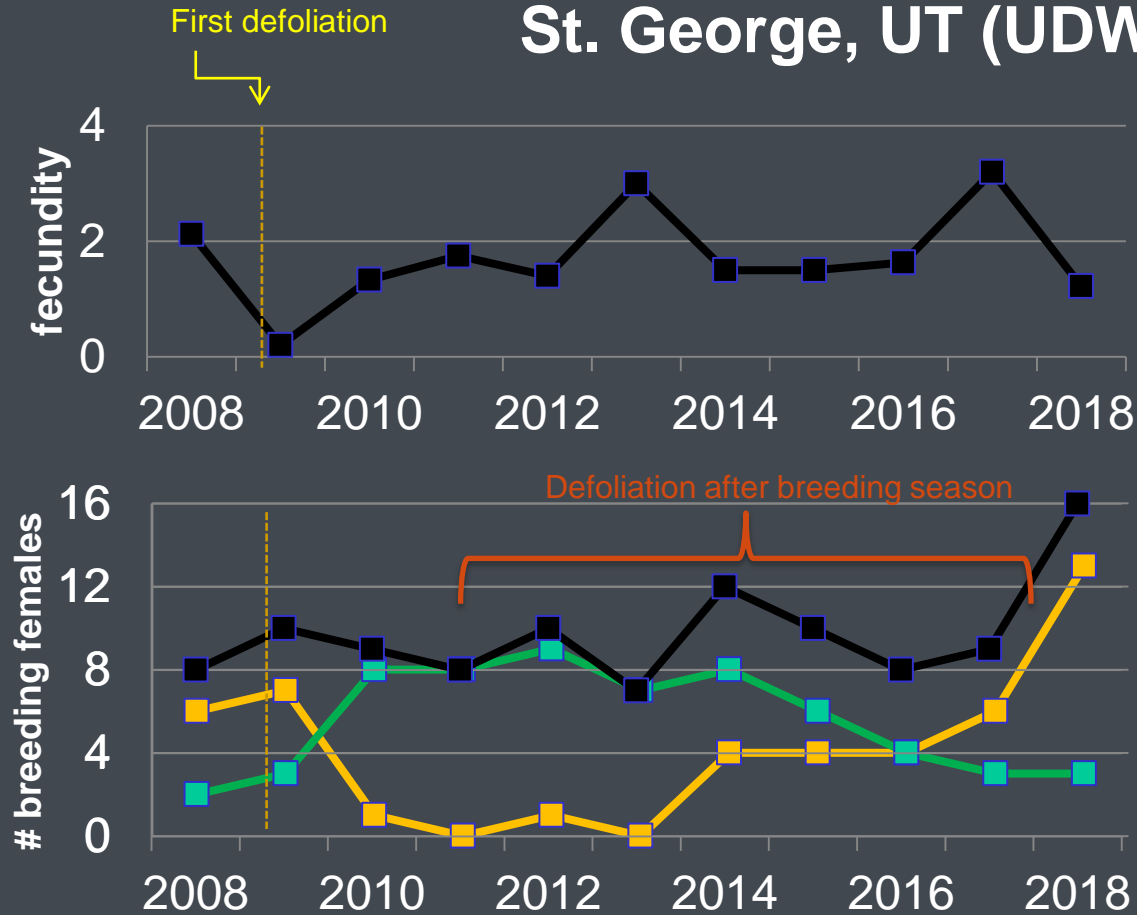
**More** time & energy on thermoregulation

Eggs **more** likely to reach lethal temp (**41°C = 106°F**) Webb 1987



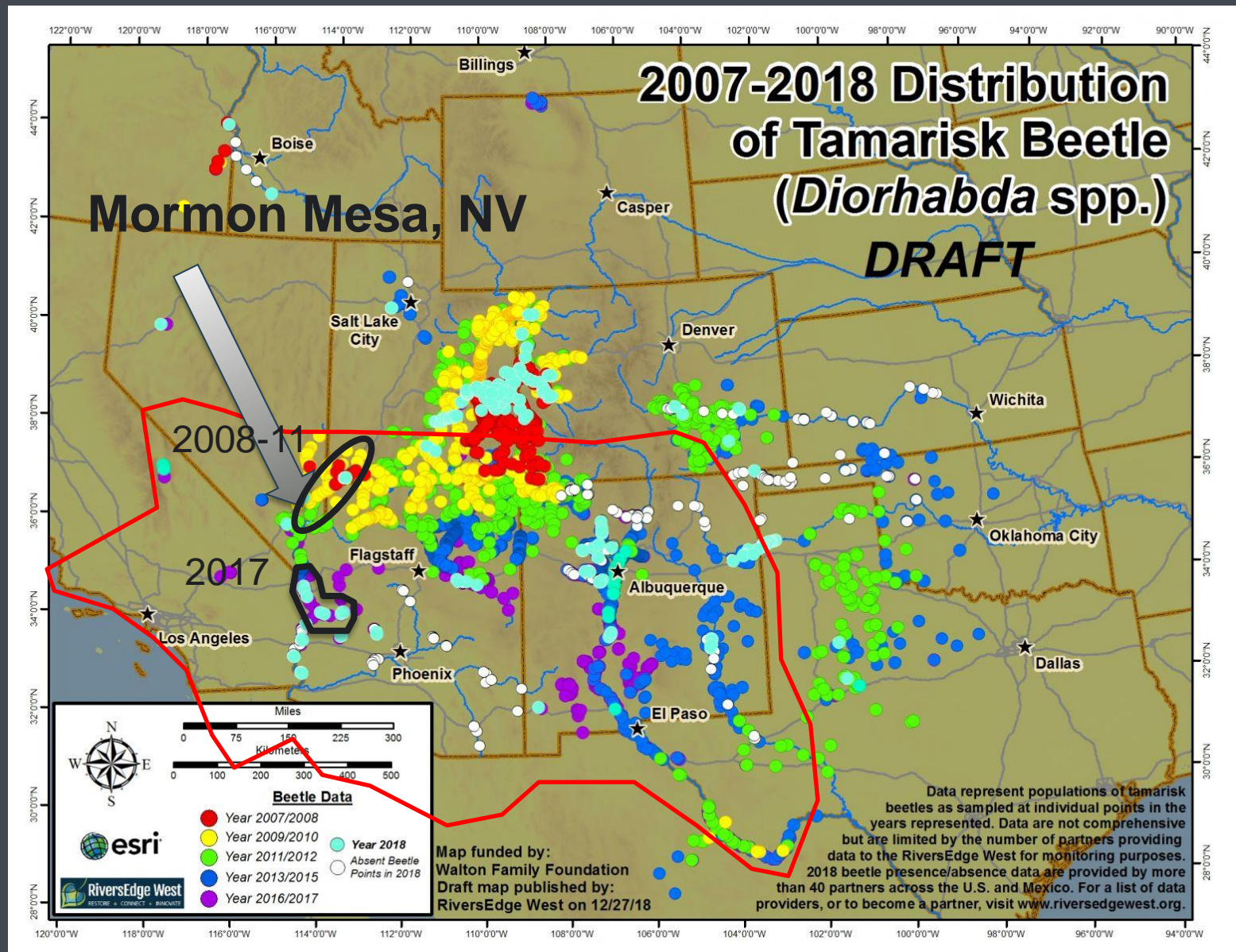


## St. George, UT (UDWR)

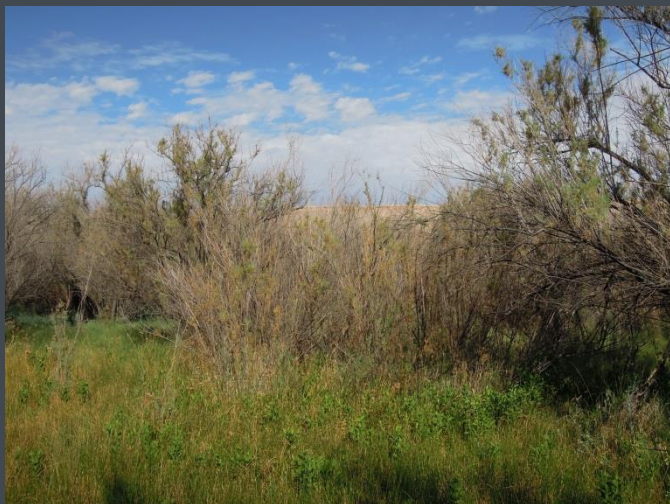
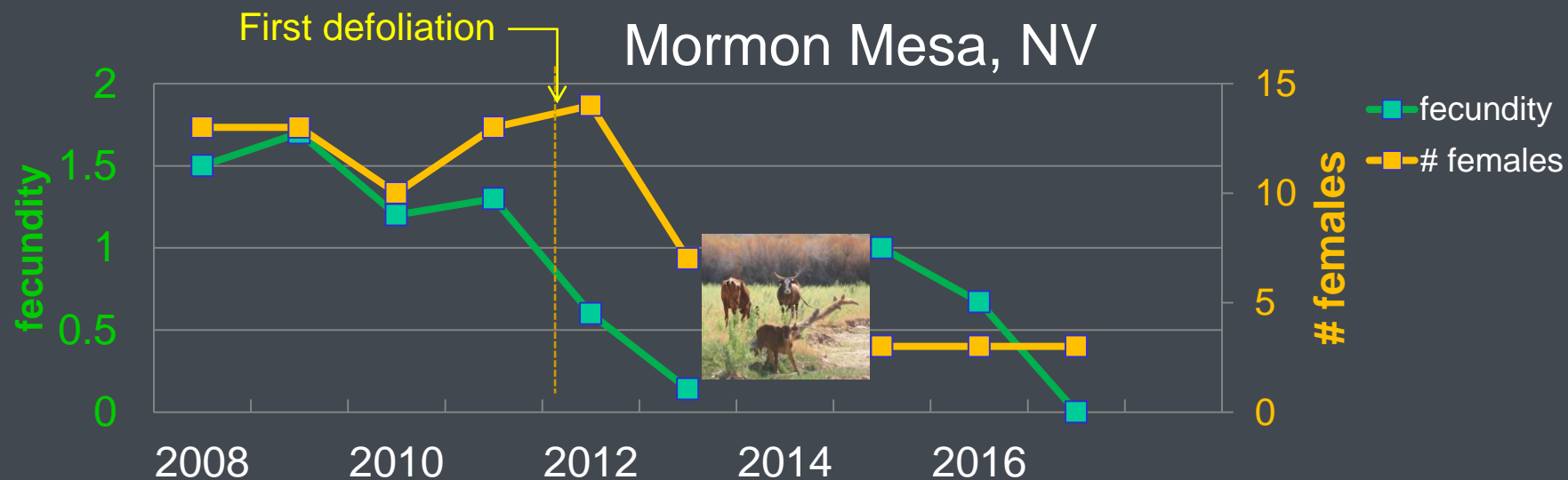


- Site fidelity strongly affected by nest success

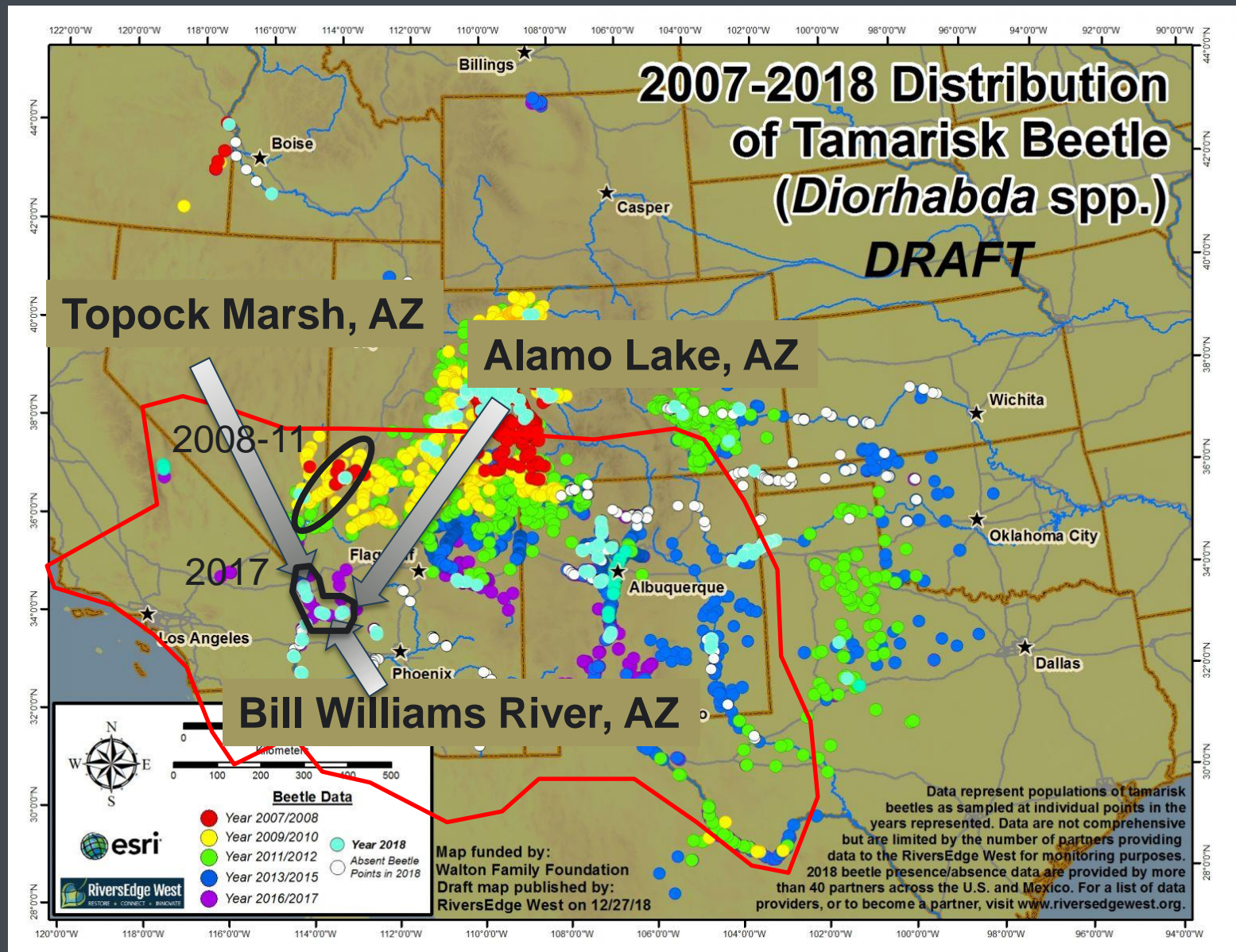




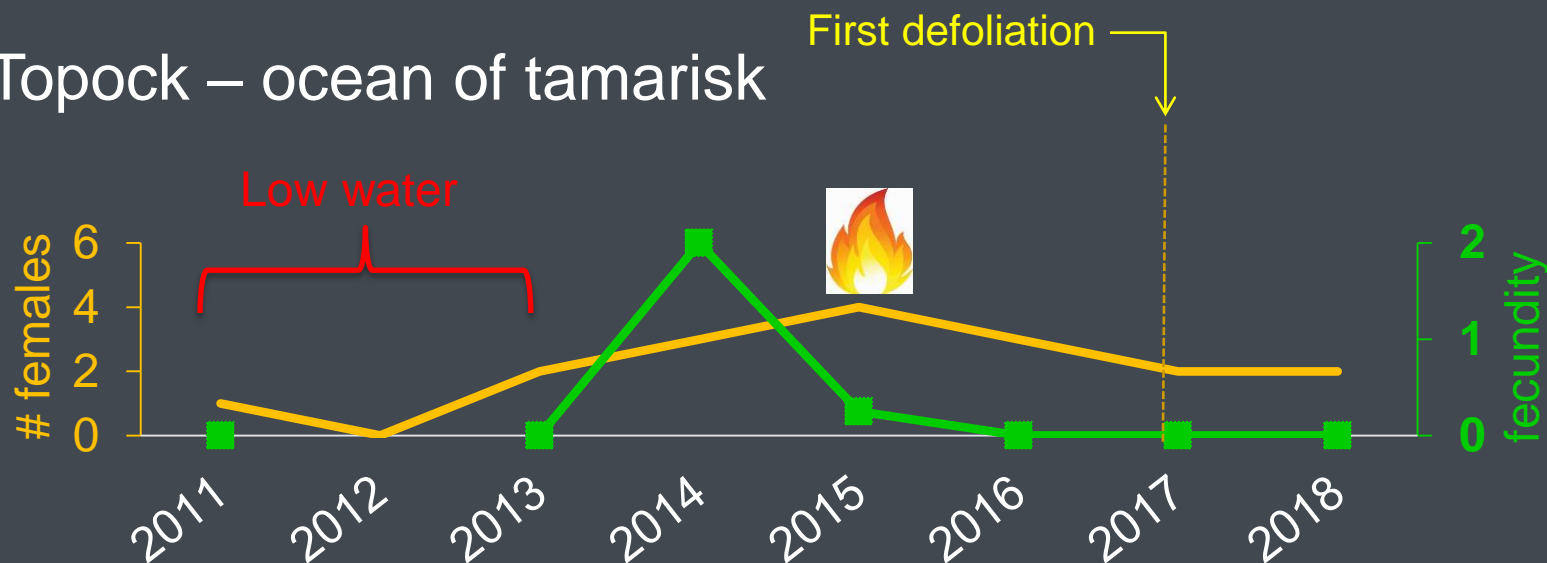
## RESULTS



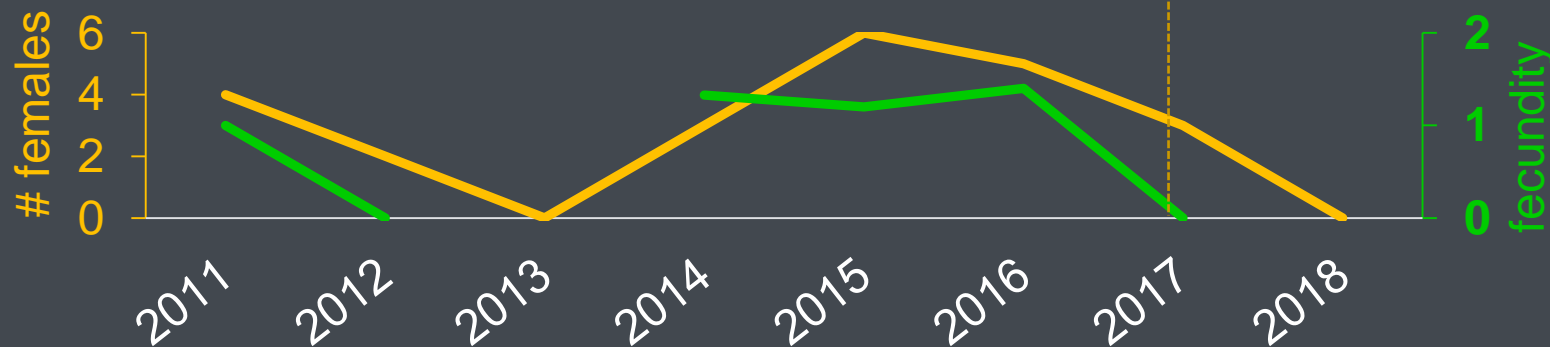




- Topock – ocean of tamarisk

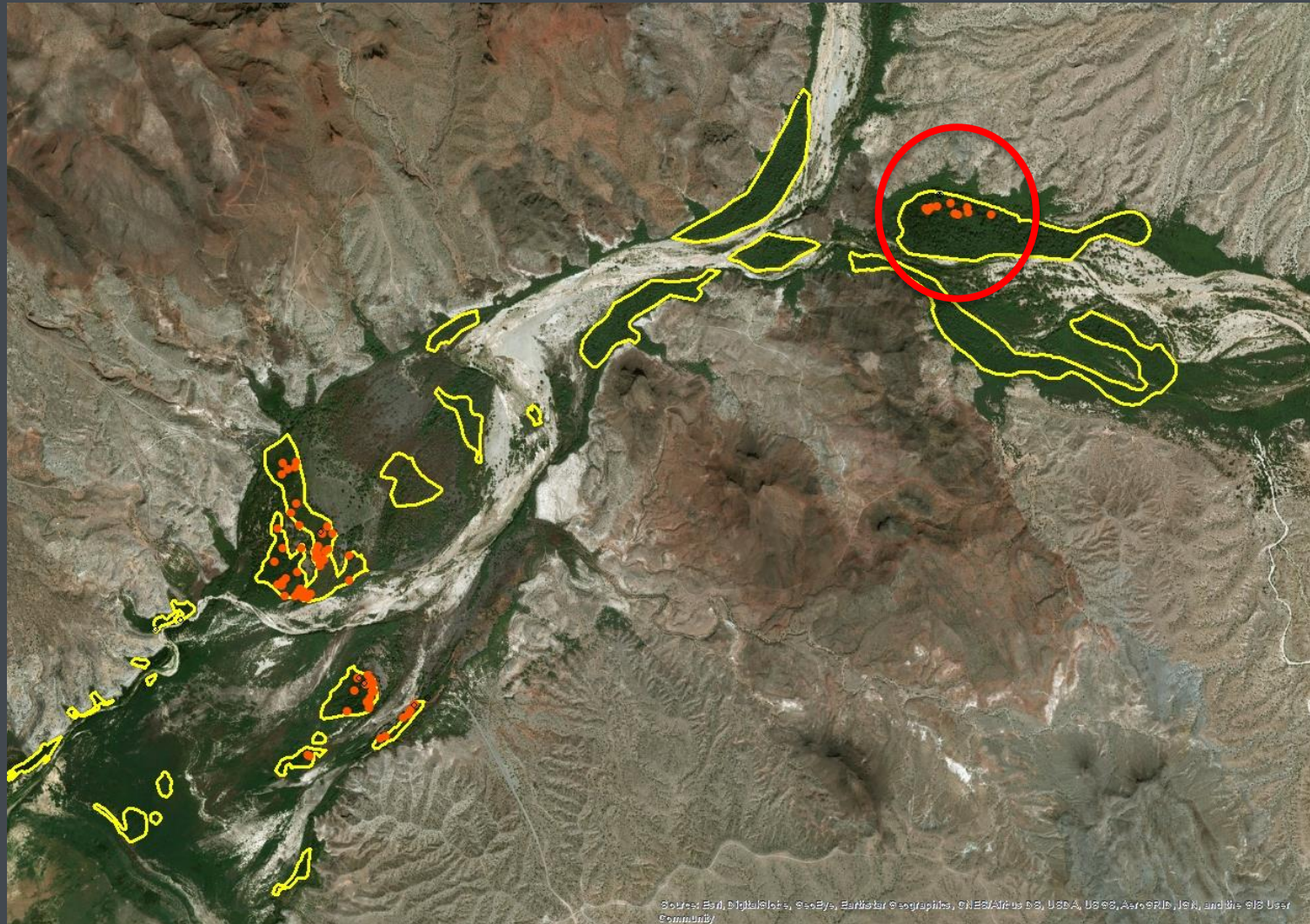


- Bill Williams – cottonwood/willow oasis ... but ... (sad trombones)

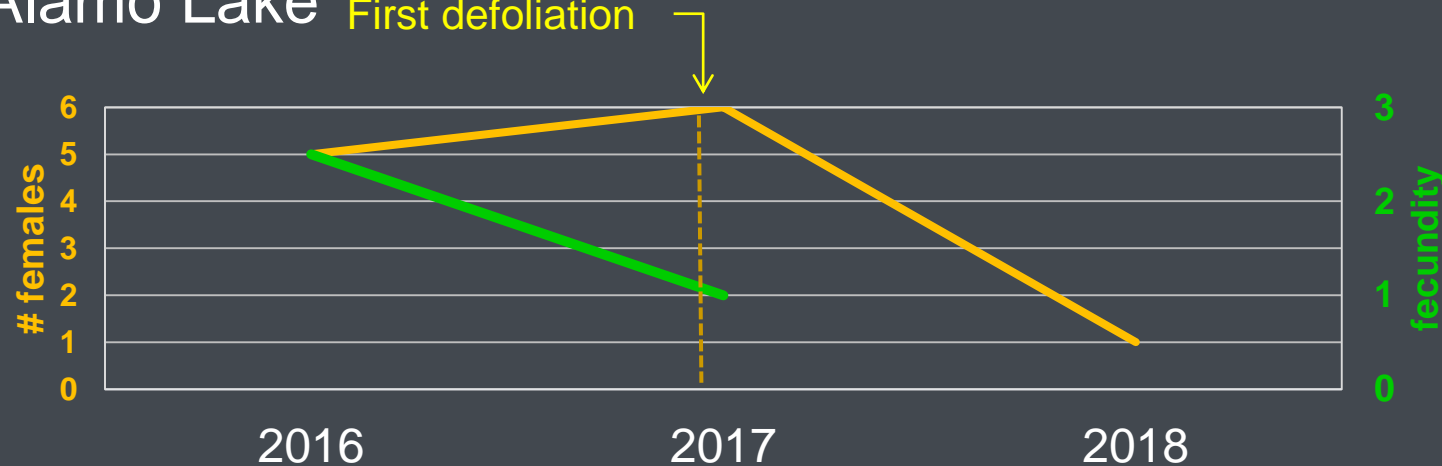




- Alamo Lake



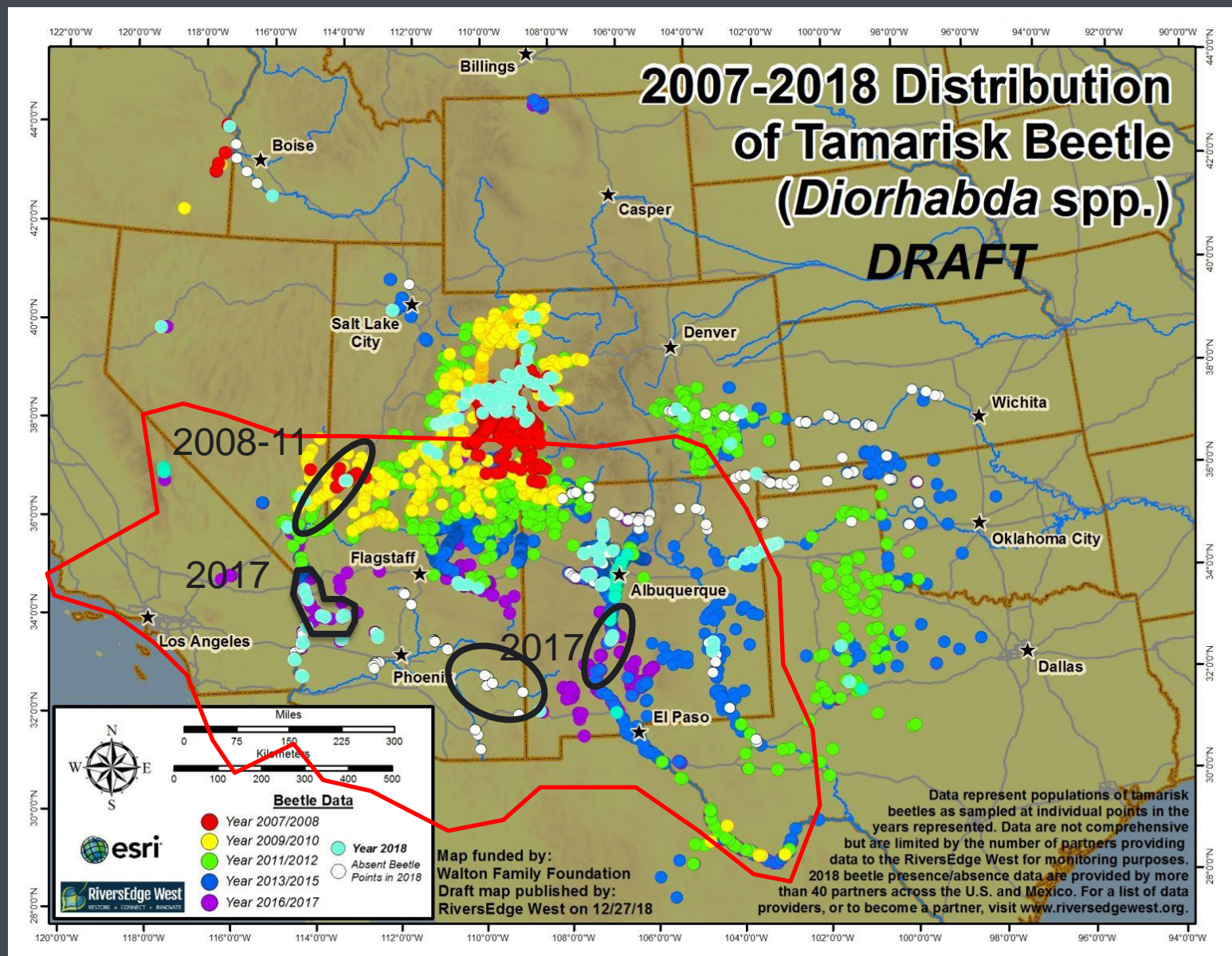
- Alamo Lake



2017 – the only successful nests were early ones; incubation and part of nestling period completed before defoliation

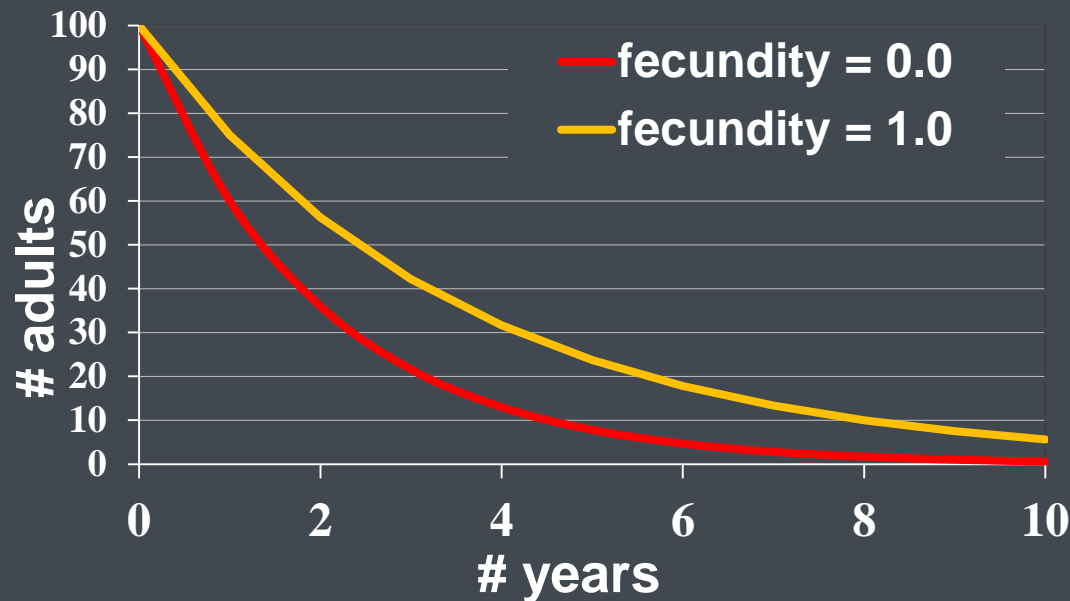
2018 – fecundity unknown (no nest monitoring)





## Flycatcher future?

- Beetles will eventually occupy entire flycatcher range
- Effects locally highly variable
- Decline inevitable





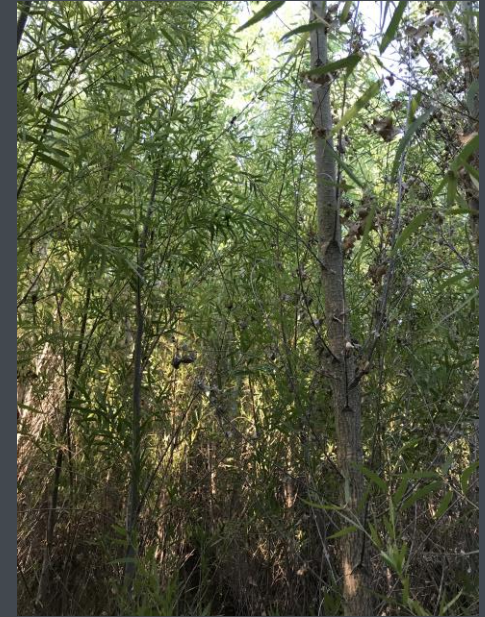
## Solutions?

- Immediate, most urgent goal:
  - prevent local extirpation
    - 2% of adult flycatcher dispersals are > 50 km
    - once gone from a river, may be hard to get them back



## Solutions?

- What do we need?
  - MORE TREES!
- When do we need it?
  - NOW! (yesterday)
- Where do we need it?
  - Near existing flycatcher populations in tamarisk
    - < 30 km, closer is better
  - Careful site selection to maximize chances of success
    - near water
    - formerly occupied, beetle-affected flycatcher sites

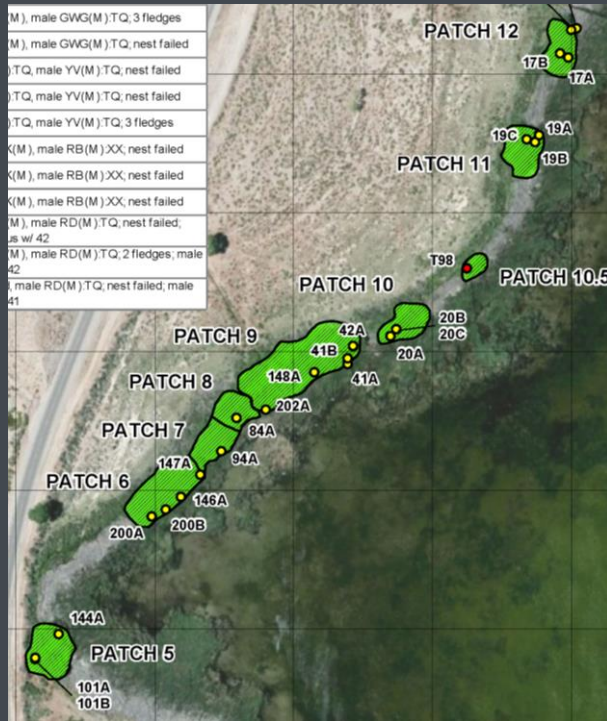




## Solutions?

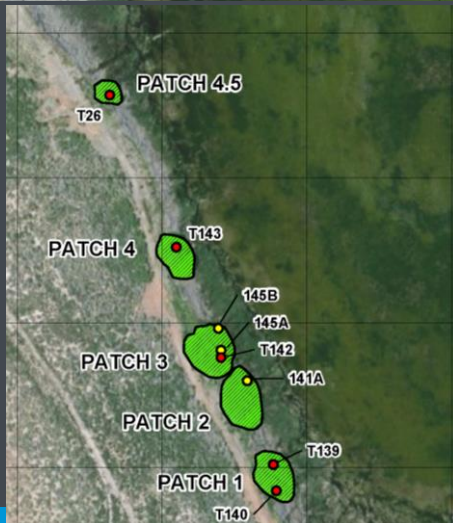
- How big?
  - These are not grizzly bears (or cuckoos)
  - Home range during breeding season 0.38 ha (Cardinal 2005)
  - 5-yr review: 1.1 ha per territory
  - Multiple small patches in close proximity can function as a larger patch





## Small patch examples

- Key Pittman (Lincoln Co., NV)
  - “String of pearls”
  - Coyote willow
  - Patches as small as 0.05 ha
  - Total size 1.5 ha
  - Supported up to 17 pairs







## Small patch examples

- Mormon Mesa
  - Dense **coyote willow**
    - 3 patches, biggest 0.15 ha
    - nest sites (one per patch)
  - **Goodding's willow** overstory
    - singing perches, foraging
- Total area ~ 1 ha
- Surrounded by dead tamarisk



Do not discount the value of a site just because it's small!



### Big patch examples

- LCR MSCP
  - Cottonwood-willow
  - 20–40 ha blocks
  - 2005–ongoing







### Big patch examples

- LCR MSCP
  - Cottonwood-willow
  - 20–40 ha blocks
  - 2005–ongoing
  - So far no breeding flycatchers
    - Soils too dry
    - 75++ km to nearest breeding site

## Opportunities!

- APHIS flycatcher conservation program
  - Looking for partners
  - Activities within APHIS's authority
  - Support flycatcher conservation
- Get those proposals in!







# Acknowledgments

Bureau of Reclamation – Boulder City (funding)

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