# 2017–2019 FLYCATCHER UPDATES

Lower Colorado River Multi-Species Conservation Program

SNCA

# SOUTHWESTERN WILLOW FLYCATCHER (*Empidonax traillii extimus*)

- Endangered subspecies of willow flycatcher
  - Subspecies status upheld during recent review
- 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

# STUDY COMPONENTS - 2017

## Broadcast Surveys

- site occupancy

## Territory / nest monitoring

- nest success rates
- causes of failure

## Banding/ resighting

- survival
- site fidelity
- dispersal

## Microhabitat at nests

- veg type
- temp/humidity

# STUDY COMPONENTS – 2018 & 2019

## Broadcast Surveys

- site occupancy

## Territory / nest monitoring

- nests – Topock and Bill Williams
- territories – Alamo Lake

## Banding/ resighting

- resighting only; no new banding

## Microhabitat at nests

- only at sites with nest monitoring

- 2017

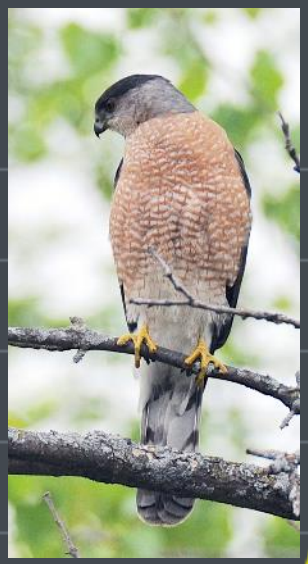
NEVADA
UTAH
CALIFORNIA
ARIZONA
MEXICO
PAHRANAGAT
MEADOW VALLEY WASH
St. George
WARM SPRINGS
MUDDY RIVER
Lake Mead
Las Vegas
Kingman
Flagstaff
TOPOCK MARSH
BILL WILLIAMS
ALAMO LAKE
Bill Williams River
Colorado River
Palm Springs
PALO VERDE ECOLOGICAL RESERVE
Quartzsite
Salton Sea
Phoenix
CIBOLA
MITTRY
Gila River
Yuma
YUMA
Lower Colorado River Southwestern
Willow Flycatcher Study 2017
SNWA Study Area
Reclamation Study Area
City/Town
Highway
River
0 25 50 Mi
0 50 100 Km
1:3,300,000
N

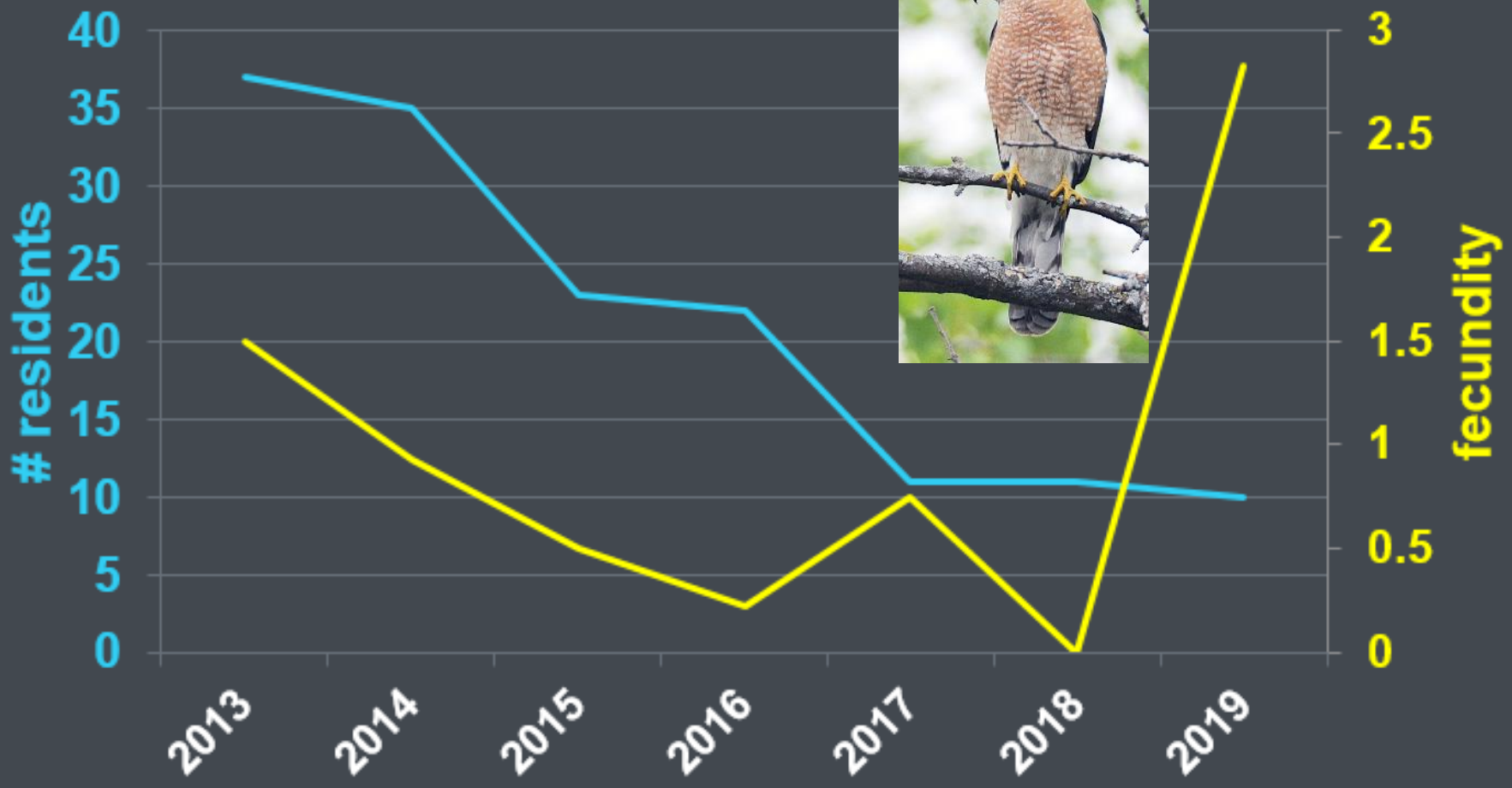
- 2018

UTAH
NEVADA
St. George
Las Vegas
Kingman
Flagstaff
TOPOCK MARSH
TOPOCK GORGE
BILL WILLIAMS
CALIFORNIA
ALAMO LAKE
ARIZONA
Palm Springs
PALO VERDE ECOLOGICAL RESERVE
Quartzsite
Phoenix
CIBOLA
IMPERIAL
MITTRY
Yuma
YUMA
MEXICO
Lower Colorado River Southwestern
Willow Flycatcher Study 2018
City/Town
Study Area
River
Highway
1:1,500,000

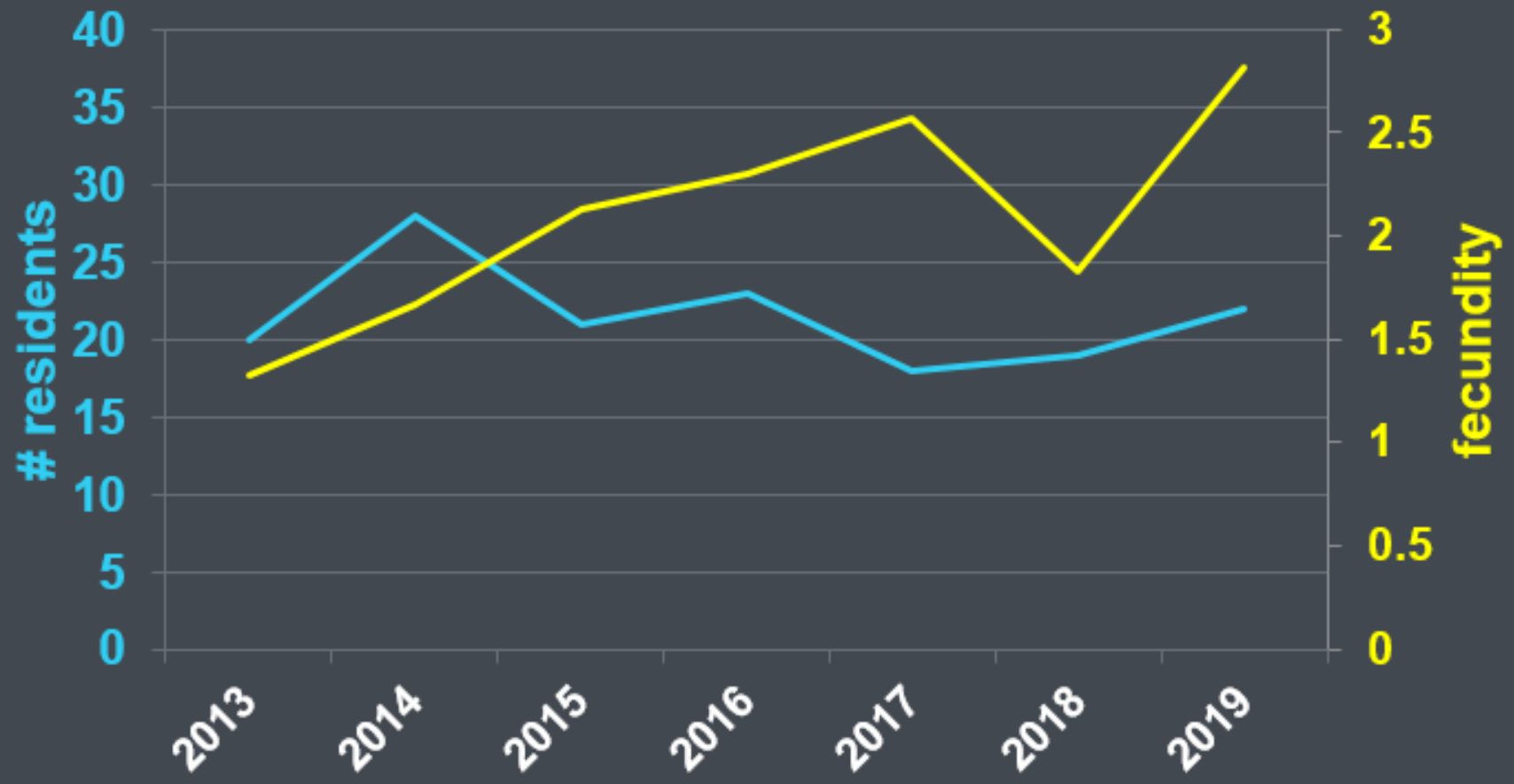
- 2019
- APHIS funding for Southern NV (NDOW 2017-18

# KEPI



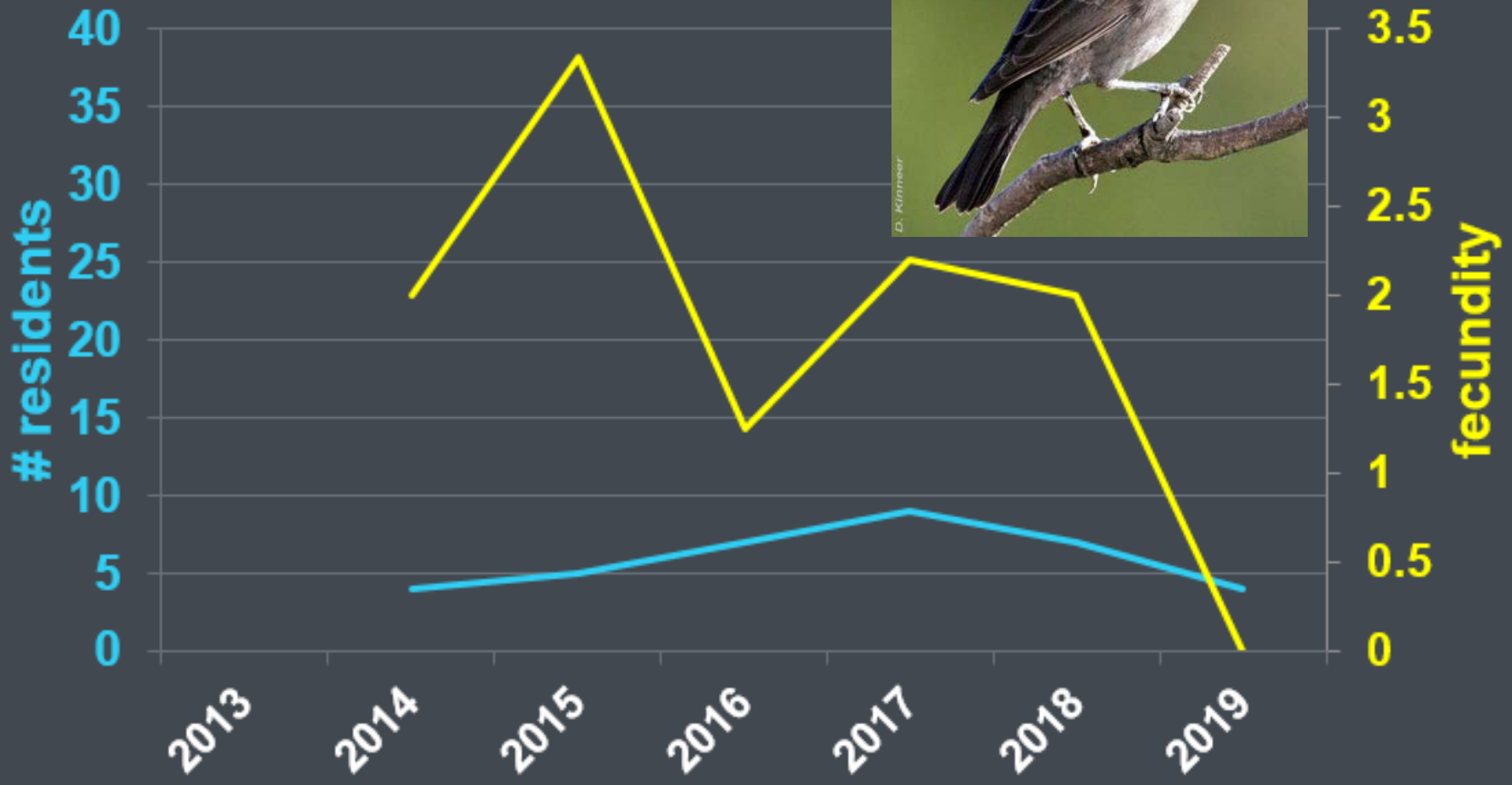

40
35
30
25
20
15
10
5
0
# residents
3
2.5
2
1.5
1
0.5
0
fecundity
2013
2014
2015
2016
2017
2018
2019

# PAHR

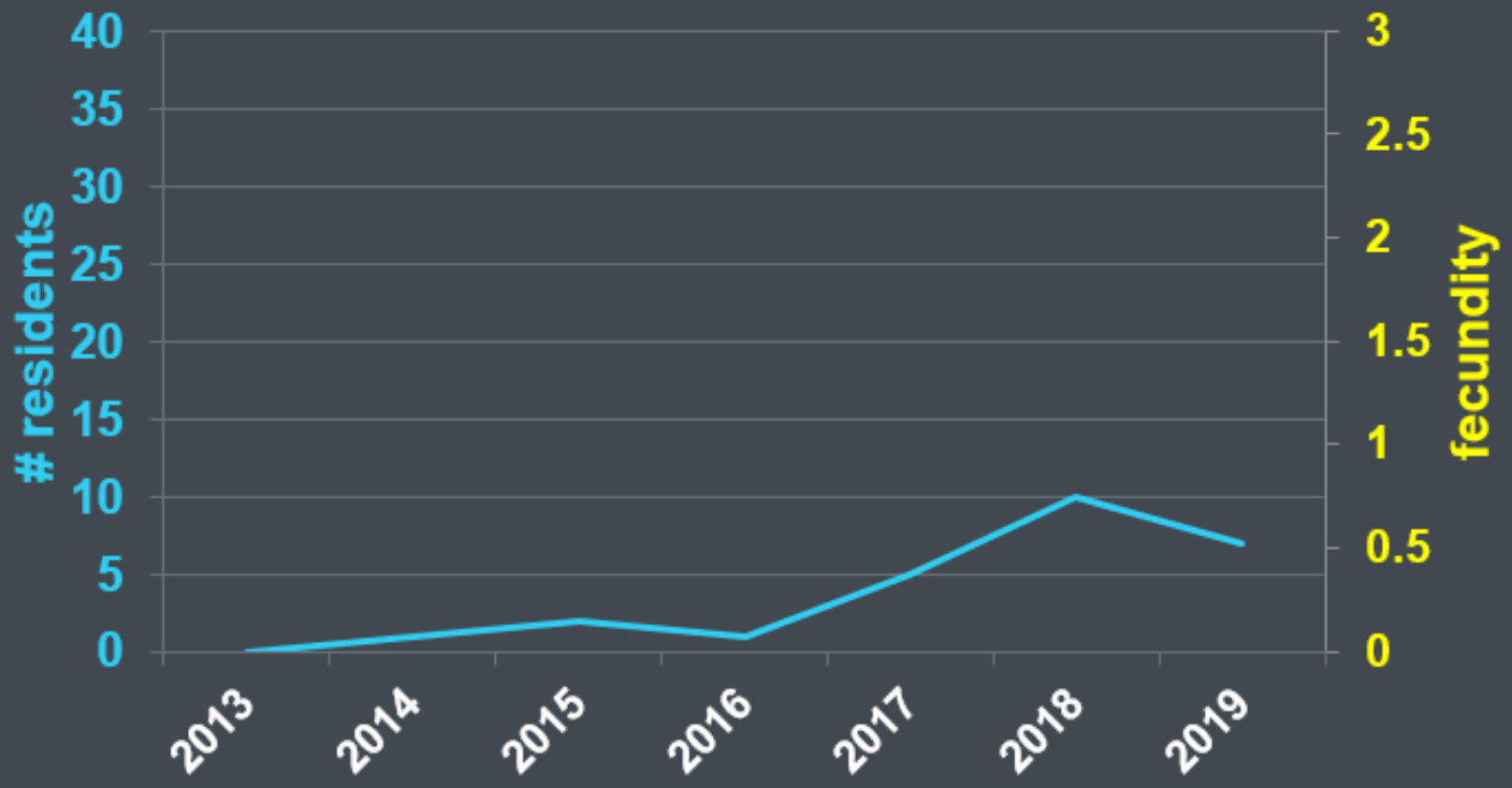

# residents
40
35
30
25
20
15
10
5
0
fecundity
3
2.5
2
1.5
1
0.5
0
2013
2014
2015
2016
2017
2018
2019

# MVWA

D. Kinnear

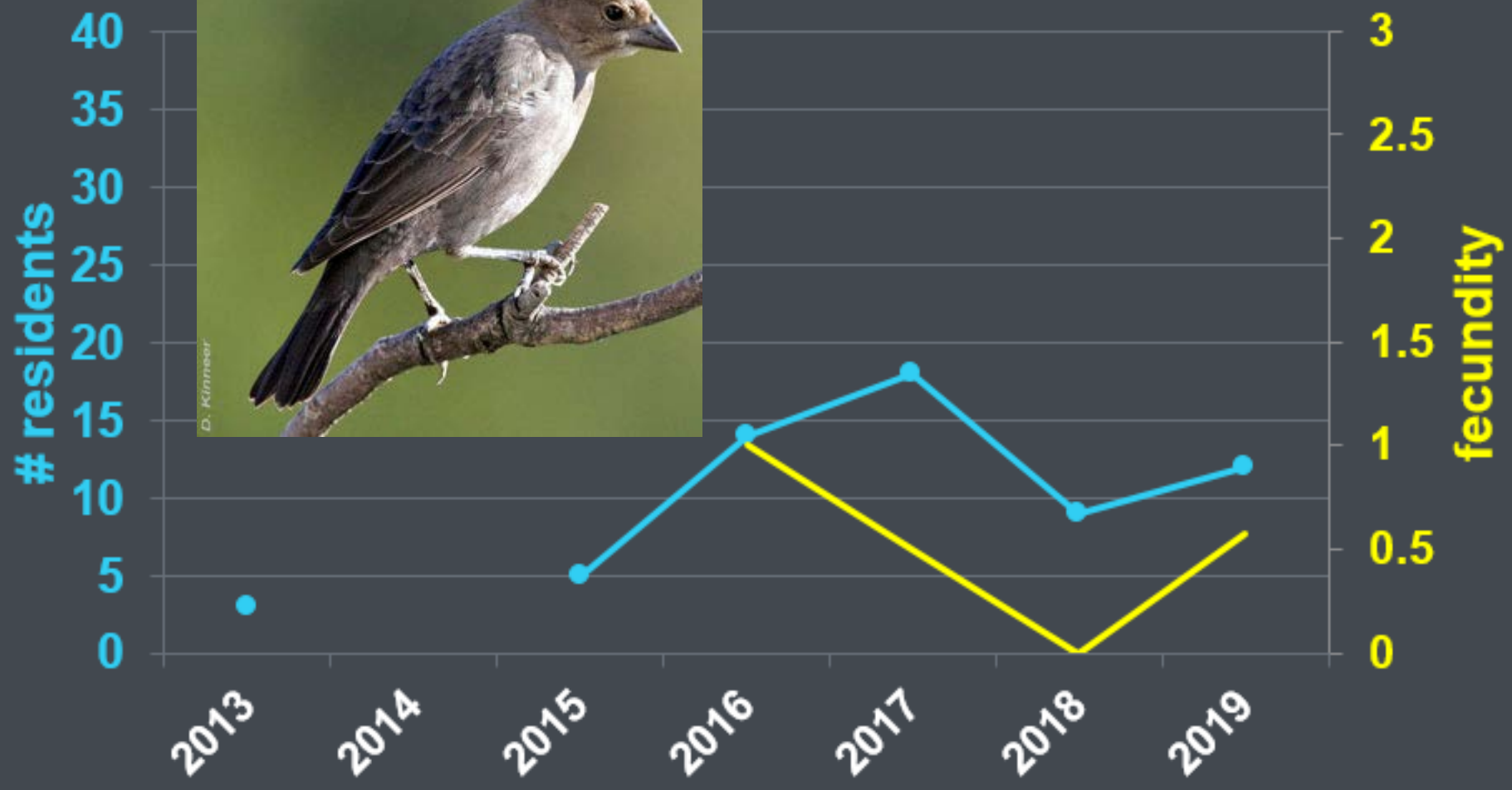

# residents
40
35
30
25
20
15
10
5
0
fecundity
3.5
3
2.5
2
1.5
1
0.5
0
2013
2014
2015
2016
2017
2018
2019

# WMSP


40
35
30
25
20
15
10
5
0
# residents
3
2.5
2
1.5
1
0.5
0
fecundity
2013
2014
2015
2016
2017
2018
2019

# MESQ

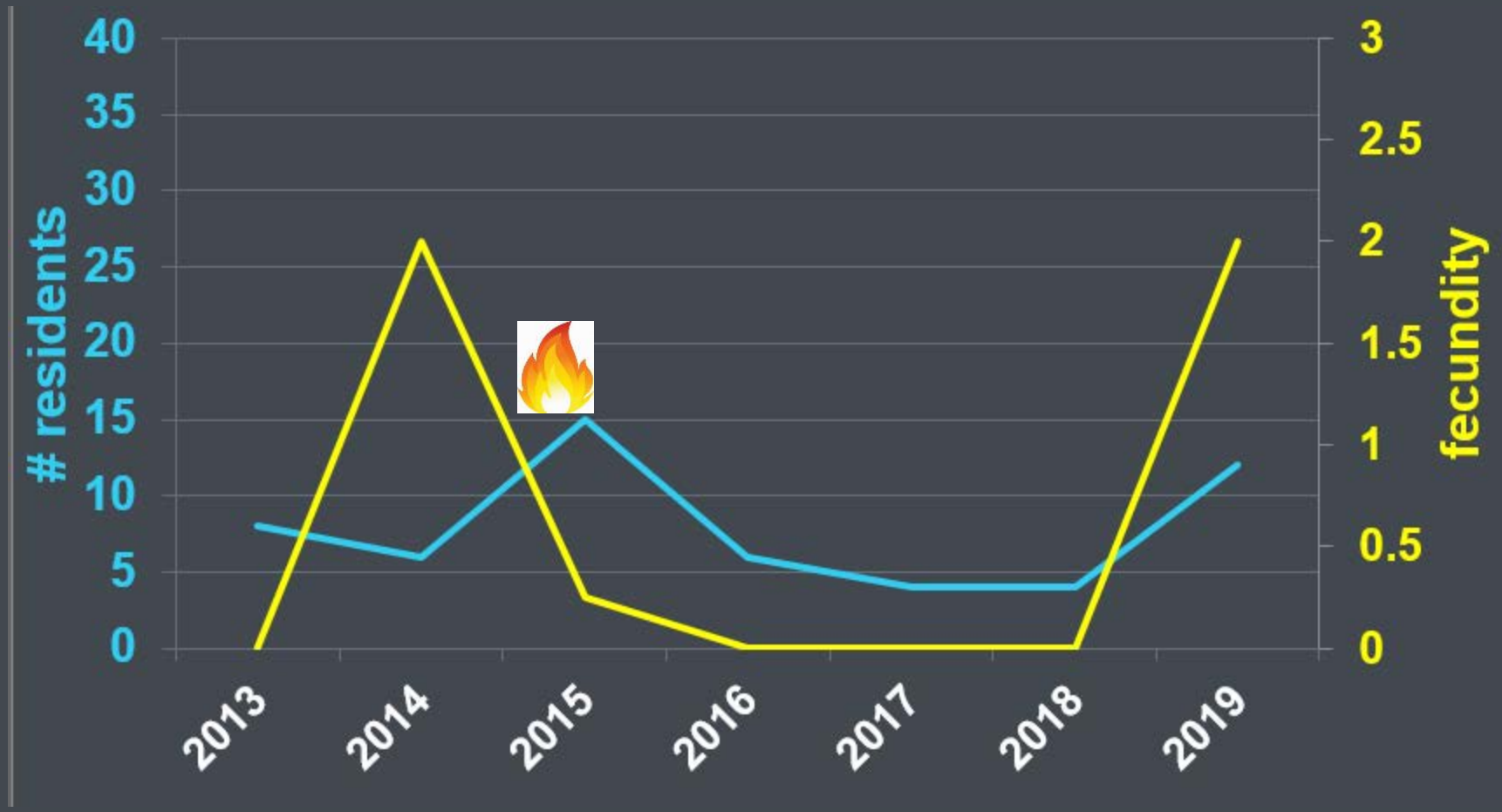
D. Kinnear


# residents
40
35
30
25
20
15
10
5
0
fecundity
3
2.5
2
1.5
1
0.5
0
2013
2014
2015
2016
2017
2018
2019

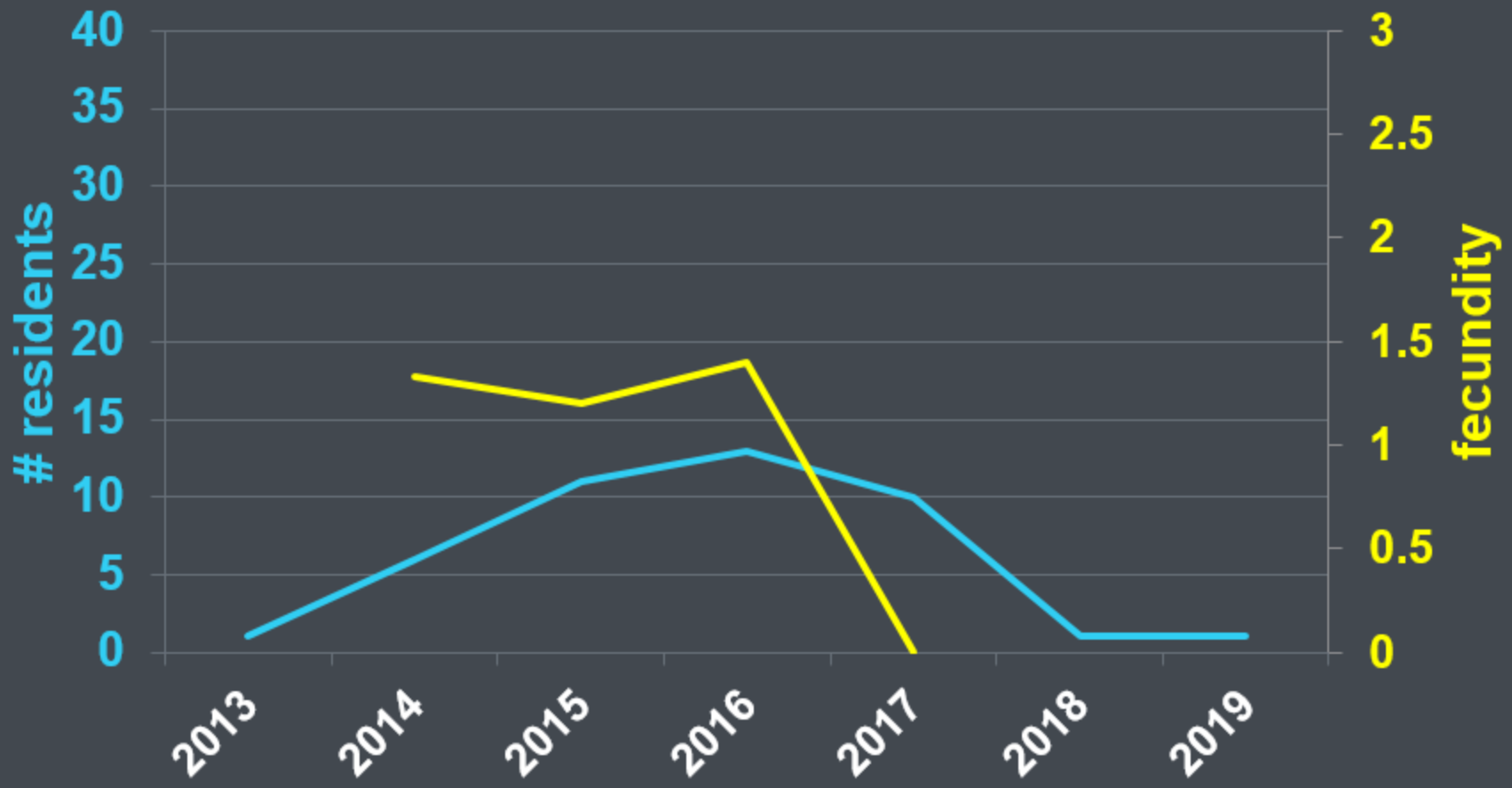
# MOME

Incomplete monitoring
# residents
fecundity
40
35
30
25
20
15
10
5
0
3
2.5
2
1.5
1
0.5
0
2013
2014
2015
2016
2017
2018
2019

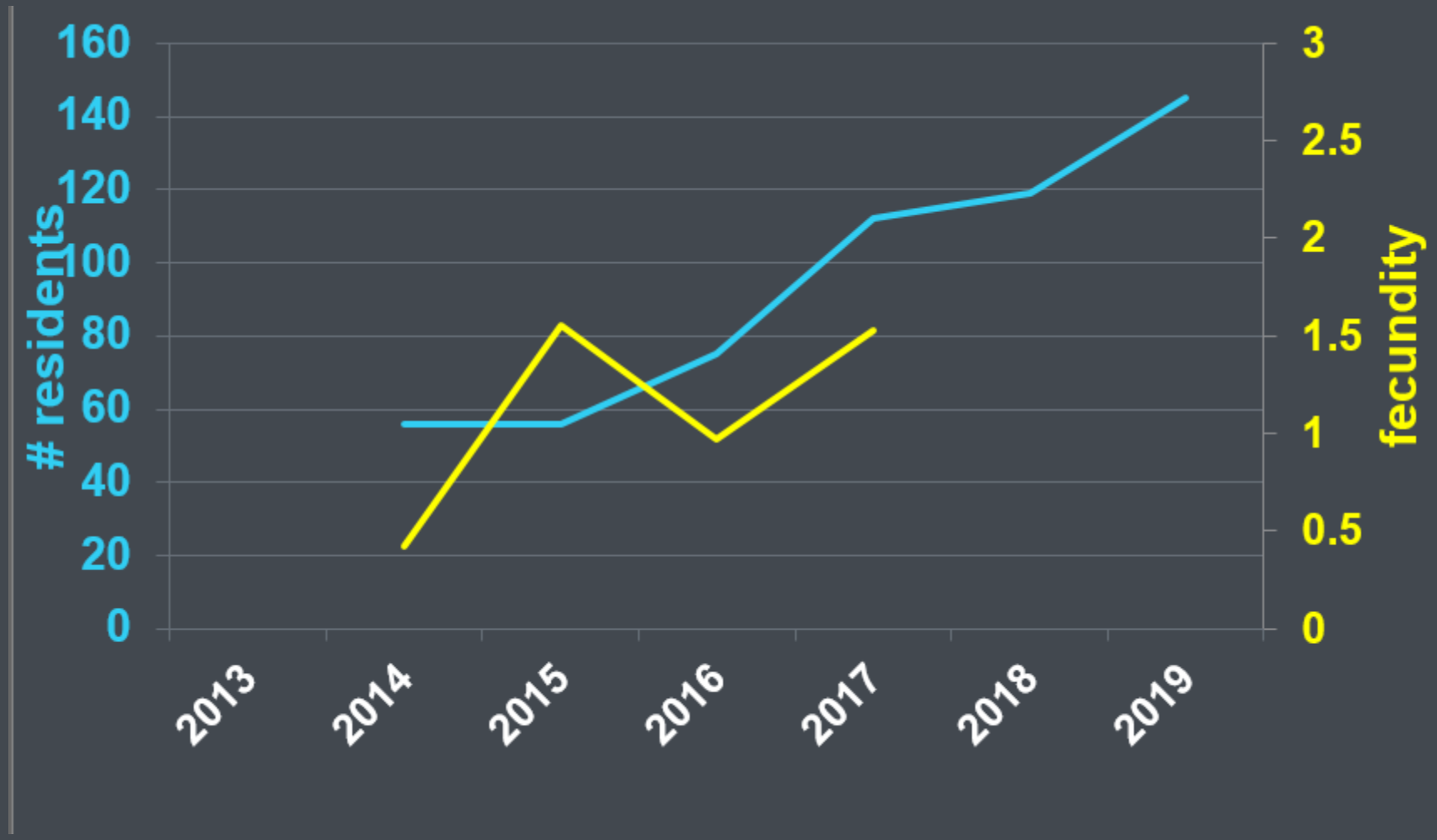
# TOPO


# residents
40
35
30
25
20
15
10
5
0
fecundity
3
2.5
2
1.5
1
0.5
0
2013
2014
2015
2016
2017
2018
2019

# BIWI

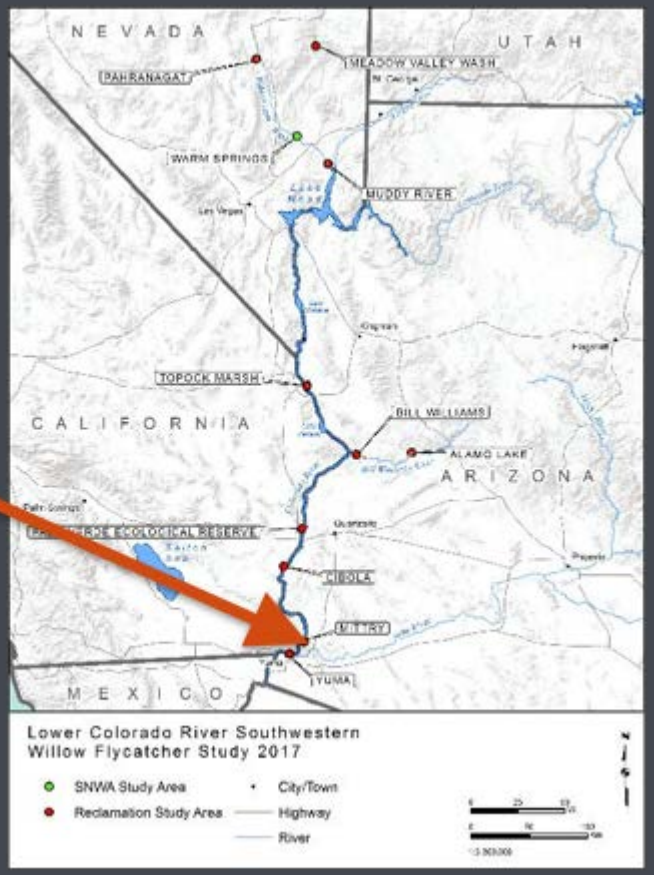

40
35
30
25
20
15
10
5
0
# residents
3
2.5
2
1.5
1
0.5
0
fecundity
2013
2014
2015
2016
2017
2018
2019

# ALAM


# residents
160
140
120
100
80
60
40
20
0
fecundity
3
2.5
2
1.5
1
0.5
0
2013
2014
2015
2016
2017
2018
2019

# FLYCATCHERS SOUTH OF BILL WILL?

- Singing flycatcher June 27, 2017 at LDCA



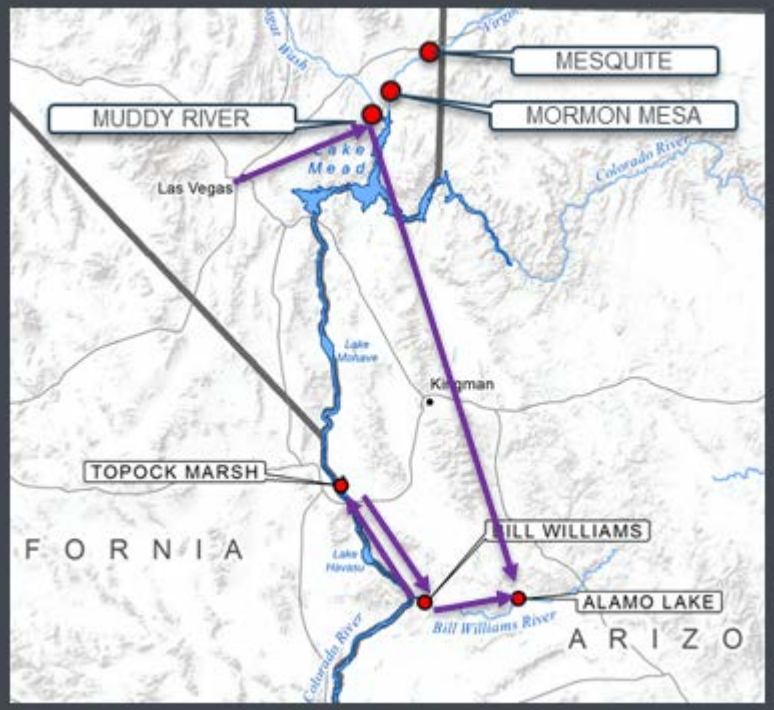
# FUN FLYCATCHER MOVEMENTS

TOPO 2015 → BIWI 2017

BIWI 2017 → ALAM 2018

BIWI 2018 → TOPO 2019

LVWA 2008 → MUDD 2009 → ALAM 2019 = A13Y !

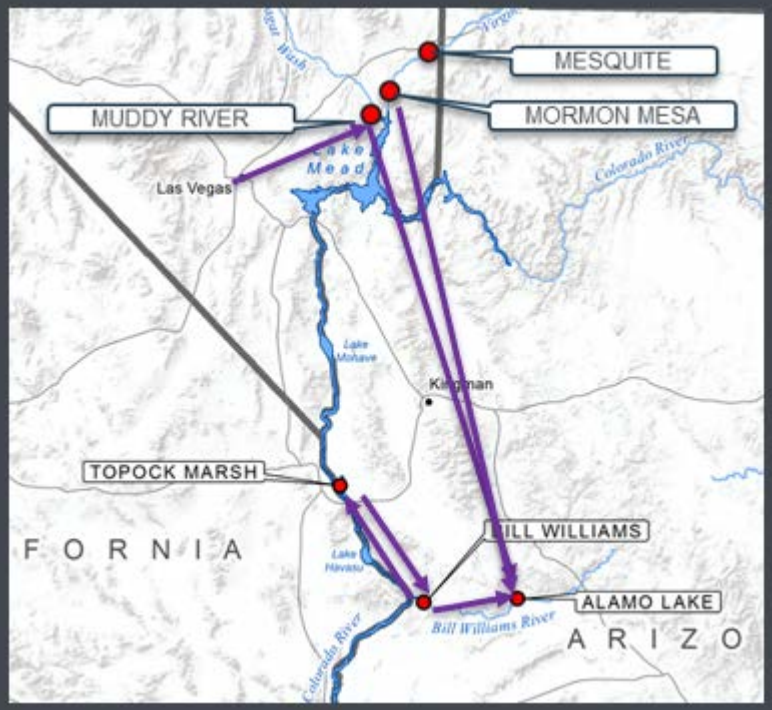


# FUN FLYCATCHER MOVEMENTS

TOPO 2015 → BIWI 2017

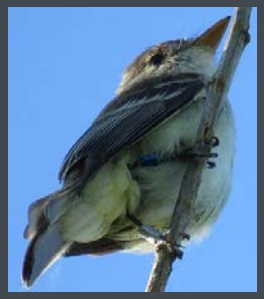
BIWI 2017 → ALAM 2018

BIWI 2018 → TOPO 2019



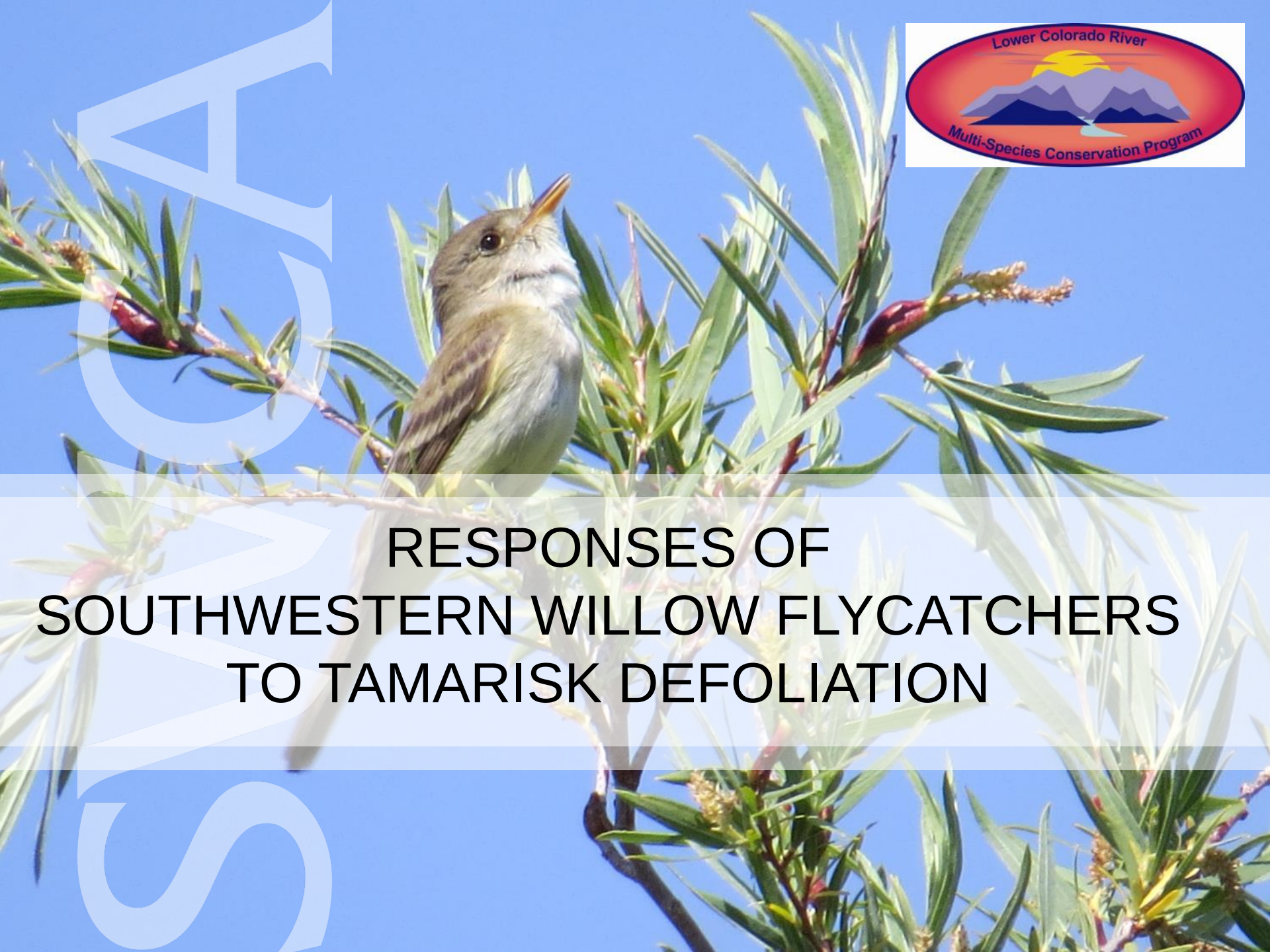

LVWA 2008 → MUDD 2009 → ALAM 2019 = A13Y !

MOME 2013 → ALAM 2019 (and ALAM 2018)



~~XX:DD~~ = older than Moses!

XX:VD = A9Y

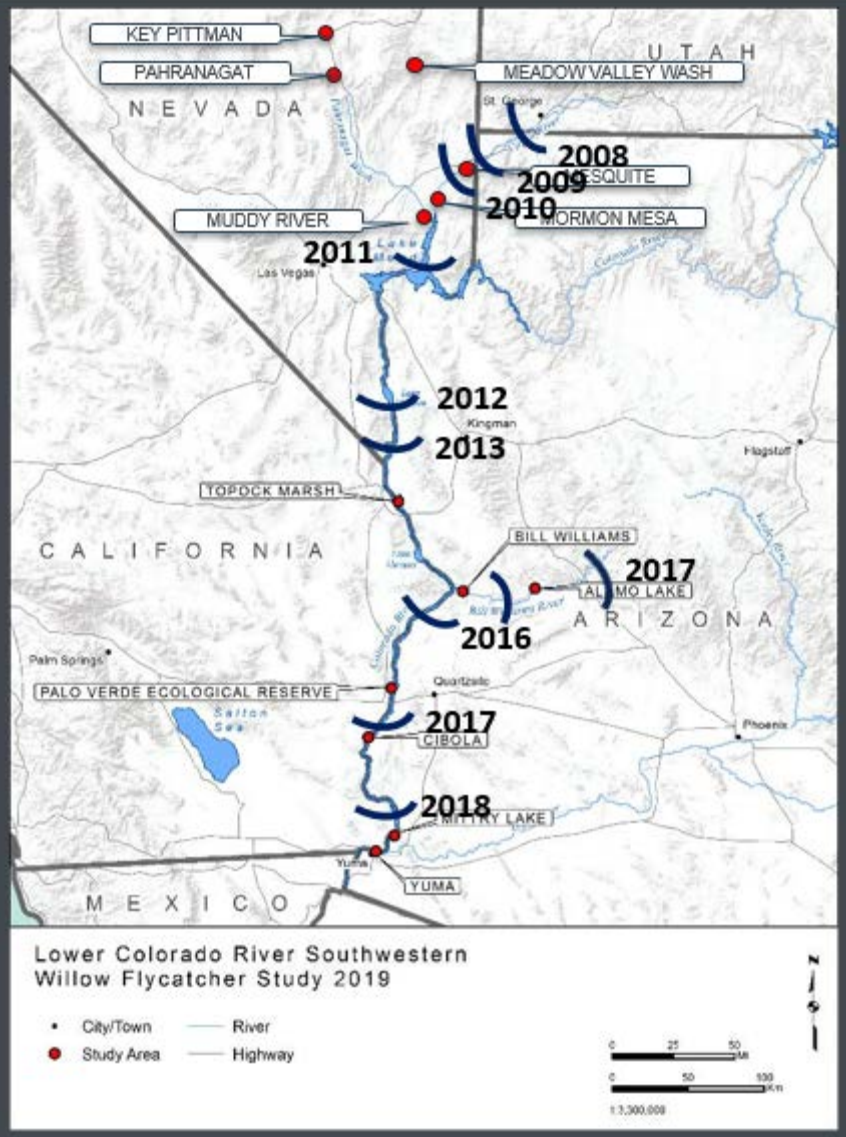


# RESPONSES OF SOUTHWESTERN WILLOW FLYCATCHERS TO TAMARISK DEFOLIATION

SWCA

# TAMARISK LEAF BEETLES

- Introduced as biocontrol for tamarisk
  - Feed on tamarisk foliage, scraping away leaf cuticle
  - Causes leaf desiccation; foliage then falls from plant, plant re-foliates
  - Active spring, summer, and fall
  - Multi-year effects widely variable, range from little apparent effect to widespread mortality
- First overlapped with breeding flycatchers in 2008


KEY PITTMAN
PAHRANAGAT
MEADOW VALLEY WASH
U T A H
N E V A D A
St. George
2008
2009
2010
MESQUITE
MORMON MESA
MUDDY RIVER
2011
Las Vegas
2012
Kingman
2013
Flagstaff
TOPOCK MARSH
BILL WILLIAMS
C A L I F O R N I A
2017
ALAMO LAKE
A R I Z O N A
2016
Palm Springs
PALO VERDE ECOLOGICAL RESERVE
Quartzsite
2017
CIBOLA
Phoenix
2018
MITTY LAKE
Yuma
YUMA
M E X I C O
Lower Colorado River Southwestern
Willow Flycatcher Study 2019
City/Town
Study Area
River
Highway
N

Rapid (1-2 weeks), complete defoliation

1-3 times within a season, May-Sept

Repeated over many consecutive years

Long term effects include

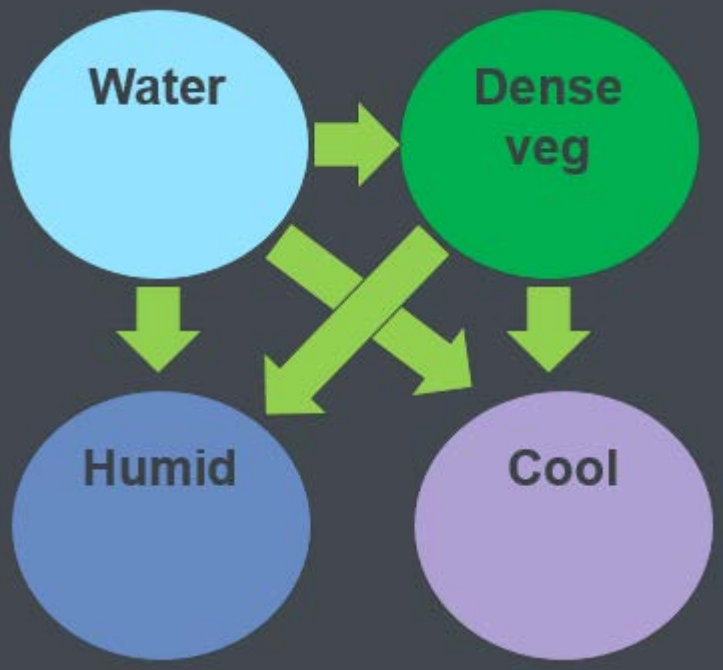
- Reduced foliage volume
- Dieback of terminal branches
- Complete mortality

Effects vary widely between sites (Hultine et al. 2014)

St. George: 7 defoliation events → <5% dieback

Mormon Mesa: 2 defoliation events → 90% dieback

# Flycatcher Habitat Preferences

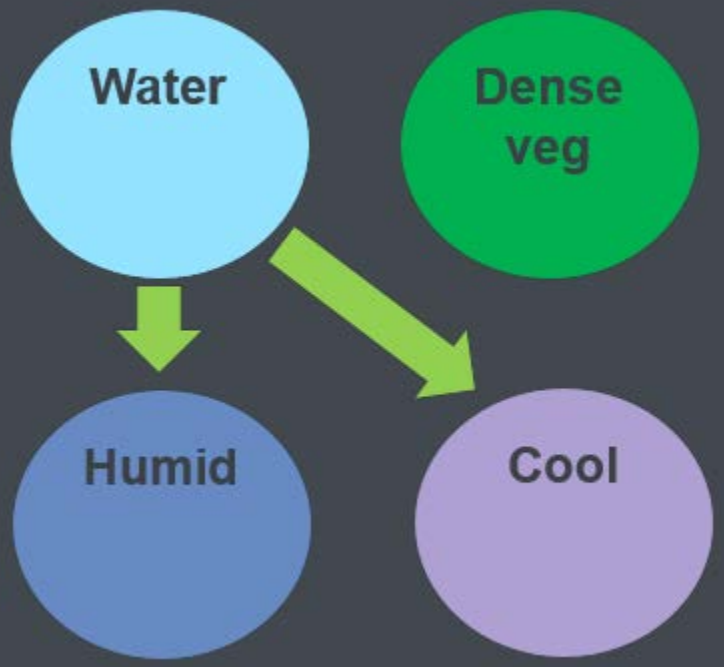


Concealment

Less time & energy on thermoregulation

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

# Flycatcher Habitat Preferences - beetle effects



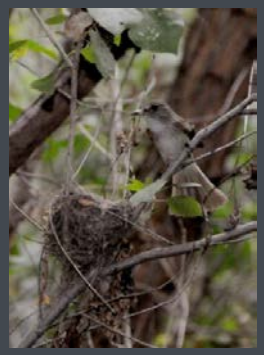
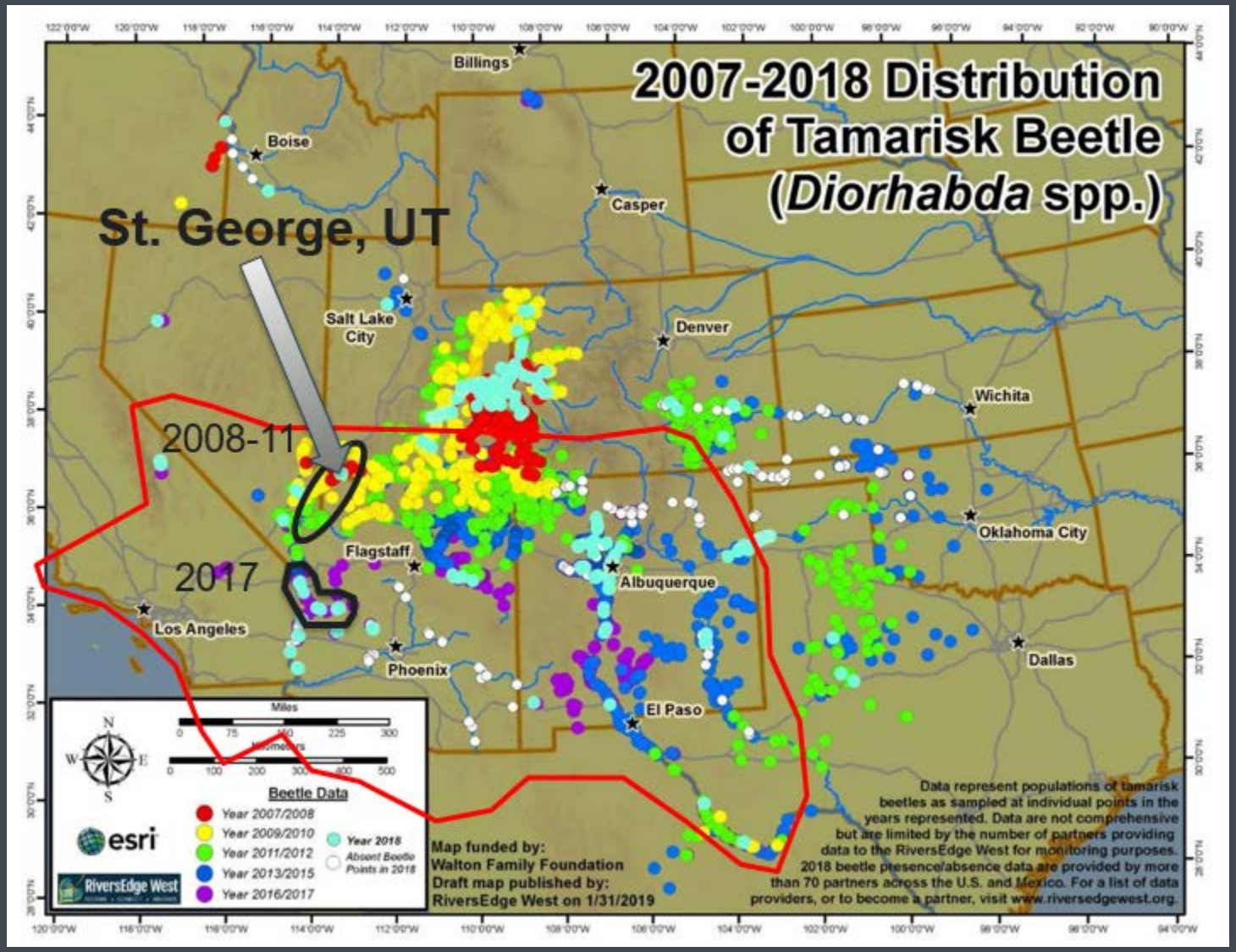



Photo credit: Pam Wheeler UDWR

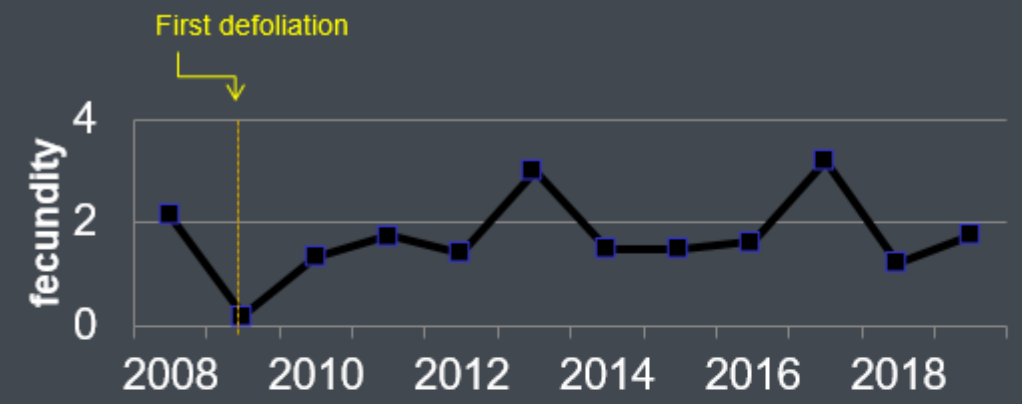
Increased visibility

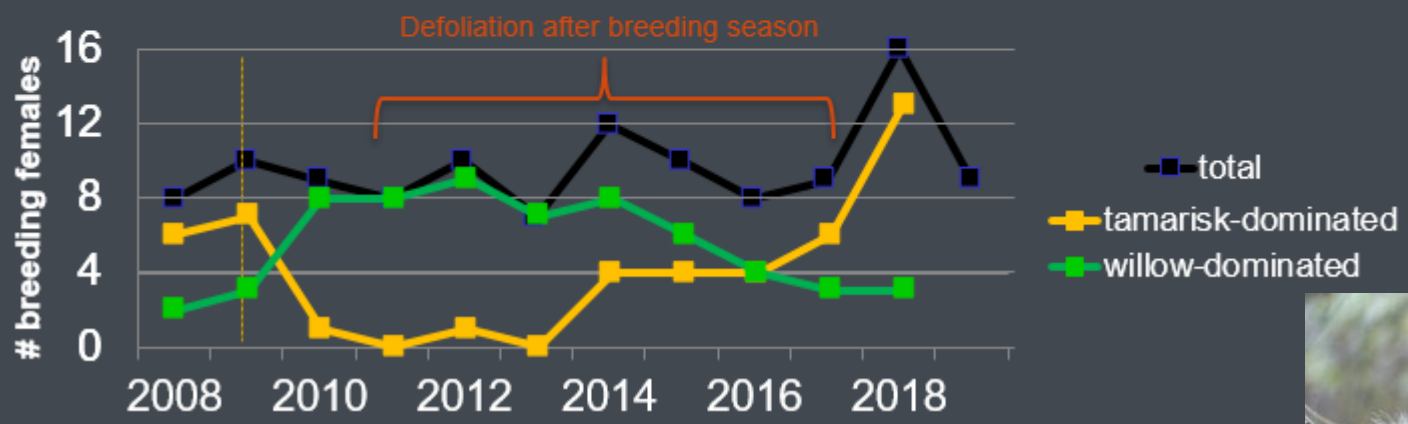
More time & energy on thermoregulation

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

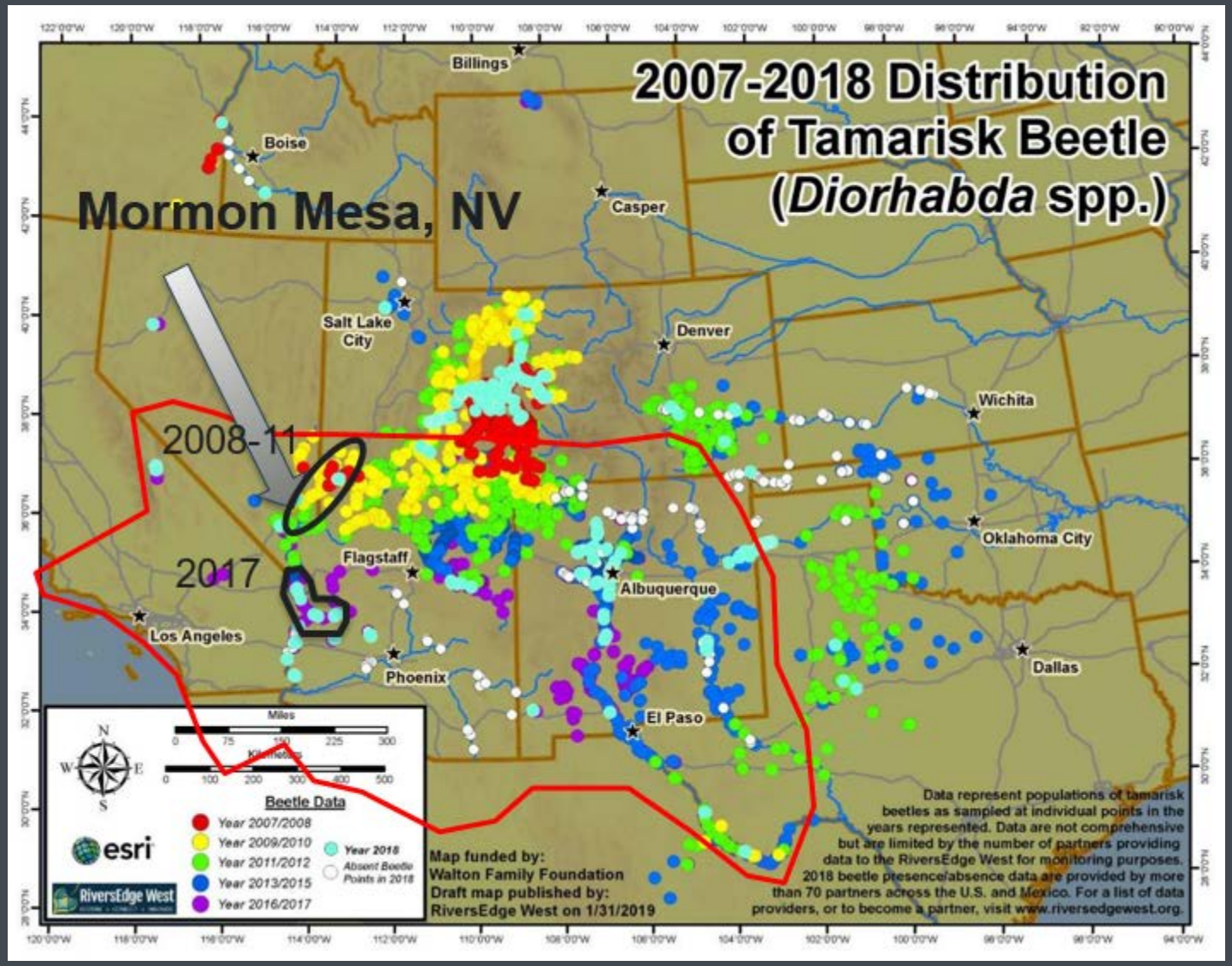

2007-2018 Distribution of Tamarisk Beetle (*Diorhabda* spp.)
St. George, UT
2008-11
2017
Billings
Boise
Casper
Salt Lake City
Denver
Wichita
Oklahoma City
Flagstaff
Albuquerque
Los Angeles
Phoenix
Dallas
El Paso
Miles
Kilometers
Beetle Data
Year 2007/2008
Year 2009/2010
Year 2011/2012
Year 2013/2015
Year 2016/2017
Year 2018
Absent Beetle Points in 2018
esri
RiversEdge West
Map funded by:
Walton Family Foundation
Draft map published by:
RiversEdge West on 1/31/2019
Data represent populations of tamarisk beetles as sampled at individual points in the years represented. Data are not comprehensive but are limited by the number of partners providing data to the RiversEdge West for monitoring purposes. 2018 beetle presence/absence data are provided by more than 70 partners across the U.S. and Mexico. For a list of data providers, or to become a partner, visit www.riversedgewest.org.

# St. George, UT (UDWR)

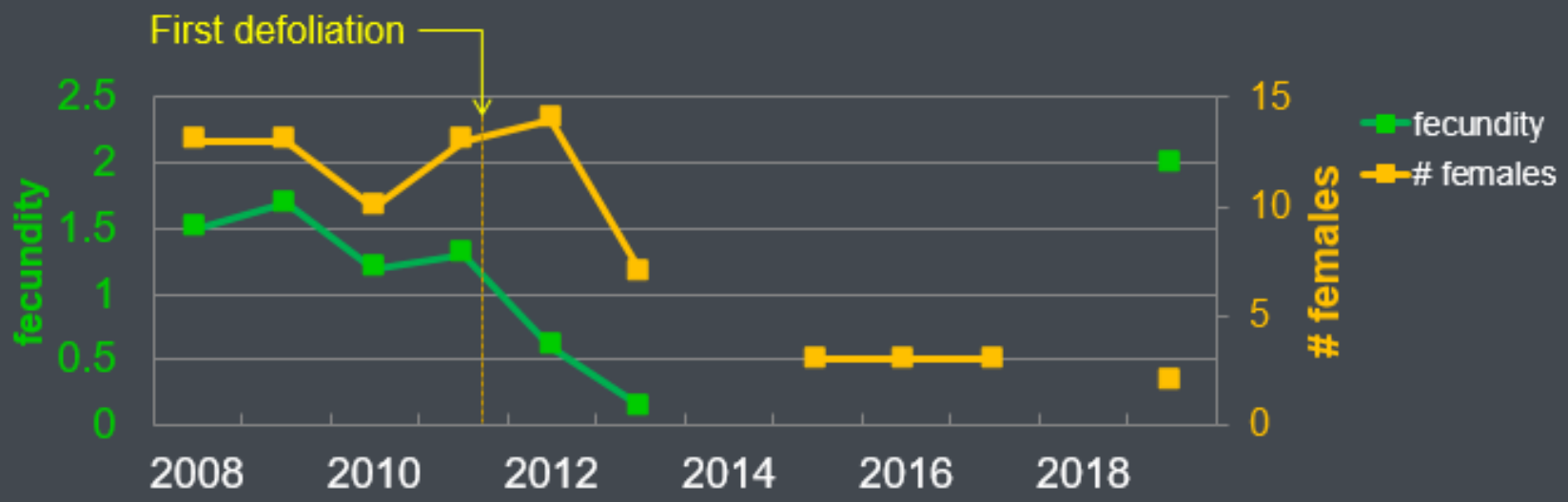


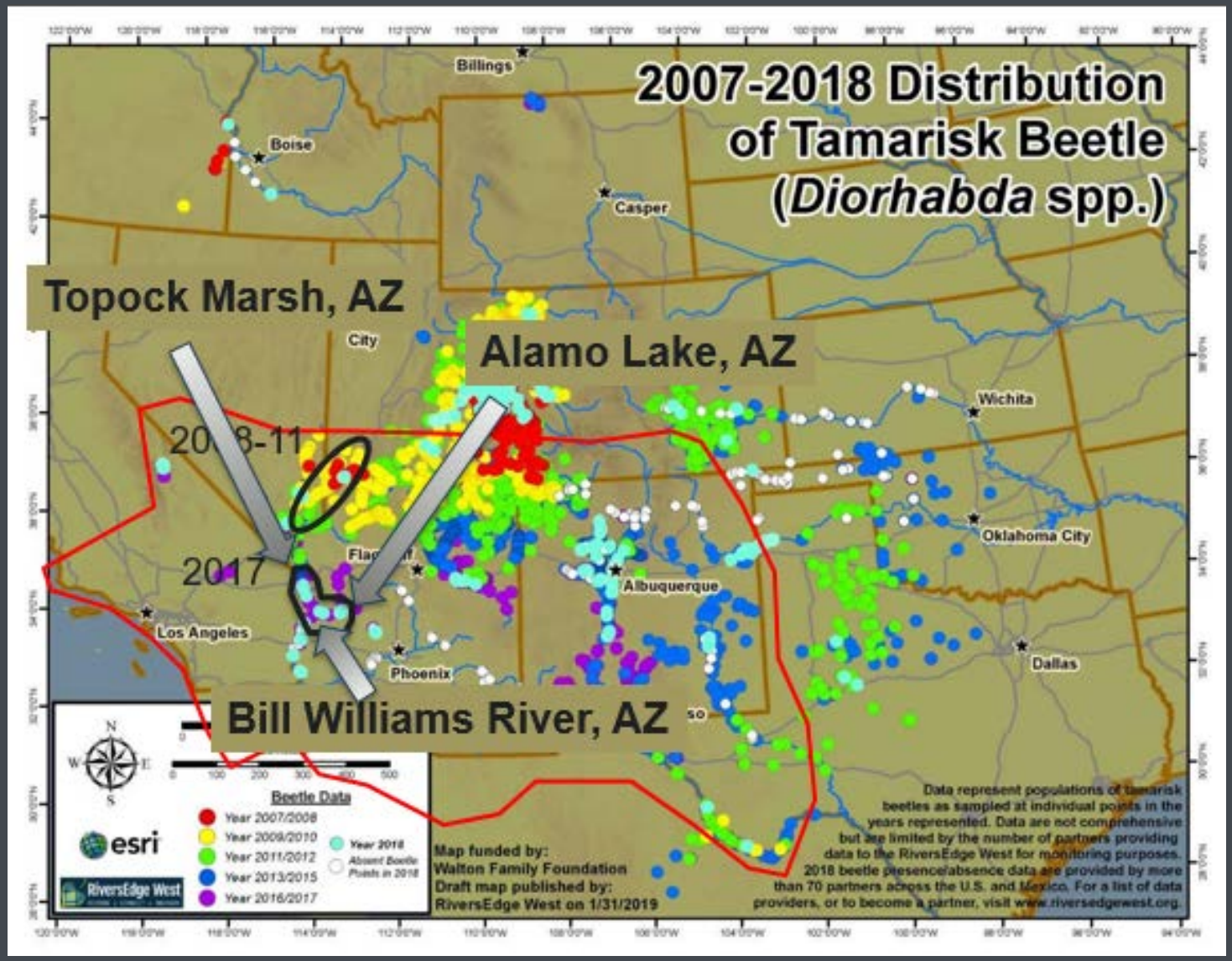



Site fidelity affected by breeding success


2007-2018 Distribution of Tamarisk Beetle (*Diorhabda* spp.)
Mormon Mesa, NV
2008-11
2017
Billings
Boise
Casper
Salt Lake City
Denver
Wichita
Oklahoma City
Flagstaff
Albuquerque
Los Angeles
Phoenix
Dallas
El Paso
Miles
Kilometers
Beetle Data
Year 2007/2008
Year 2009/2010
Year 2011/2012
Year 2013/2015
Year 2016/2017
Year 2018
Absent Beetle Points in 2018
esri
RiversEdge West
Map funded by:
Walton Family Foundation
Draft map published by:
RiversEdge West on 1/31/2019
Data represent populations of tamarisk beetles as sampled at individual points in the years represented. Data are not comprehensive but are limited by the number of partners providing data to the RiversEdge West for monitoring purposes. 2018 beetle presence/absence data are provided by more than 70 partners across the U.S. and Mexico. For a list of data providers, or to become a partner, visit www.riversedgewest.org.

# Mormon Mesa, NV




2007-2018 Distribution of Tamarisk Beetle (*Diorhabda* spp.)
Topock Marsh, AZ
Alamo Lake, AZ
Bill Williams River, AZ
2017
Billings
Boise
Casper
Wichita
Oklahoma City
Albuquerque
Los Angeles
Phoenix
Dallas
Beetle Data
Year 2007/2008
Year 2009/2010
Year 2011/2012
Year 2013/2015
Year 2016/2017
Year 2018
Absent Beetle Points in 2018
esri
RiversEdge West
Map funded by:
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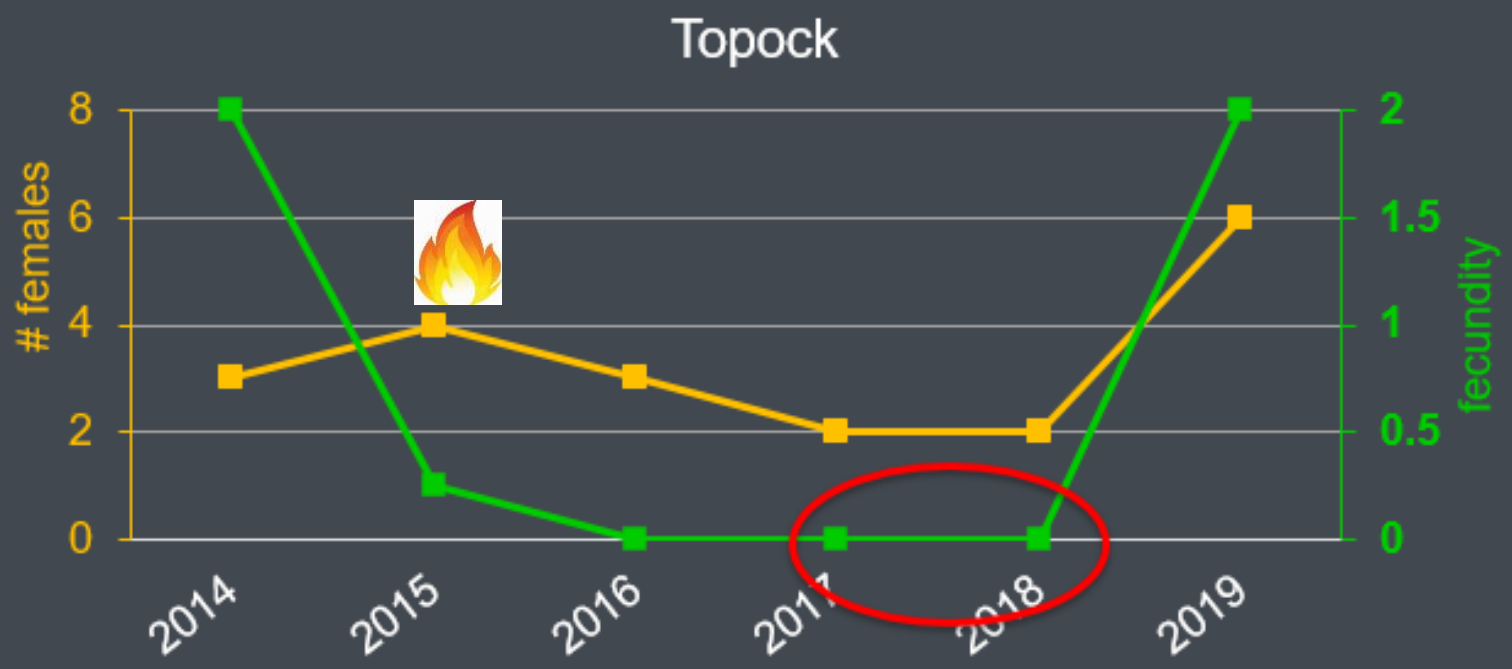
- Topock Marsh

- Topock Marsh

# Mid-June 2018

- Topock Marsh

- Topock Marsh


Topock
# females
8
6
4
2
0
2
1.5
1
0.5
0
fecundity
2014
2015
2016
2017
2018
2019

- Bill Williams

- Bill Williams

- Bill Williams

Late May 2018

- Bill Williams

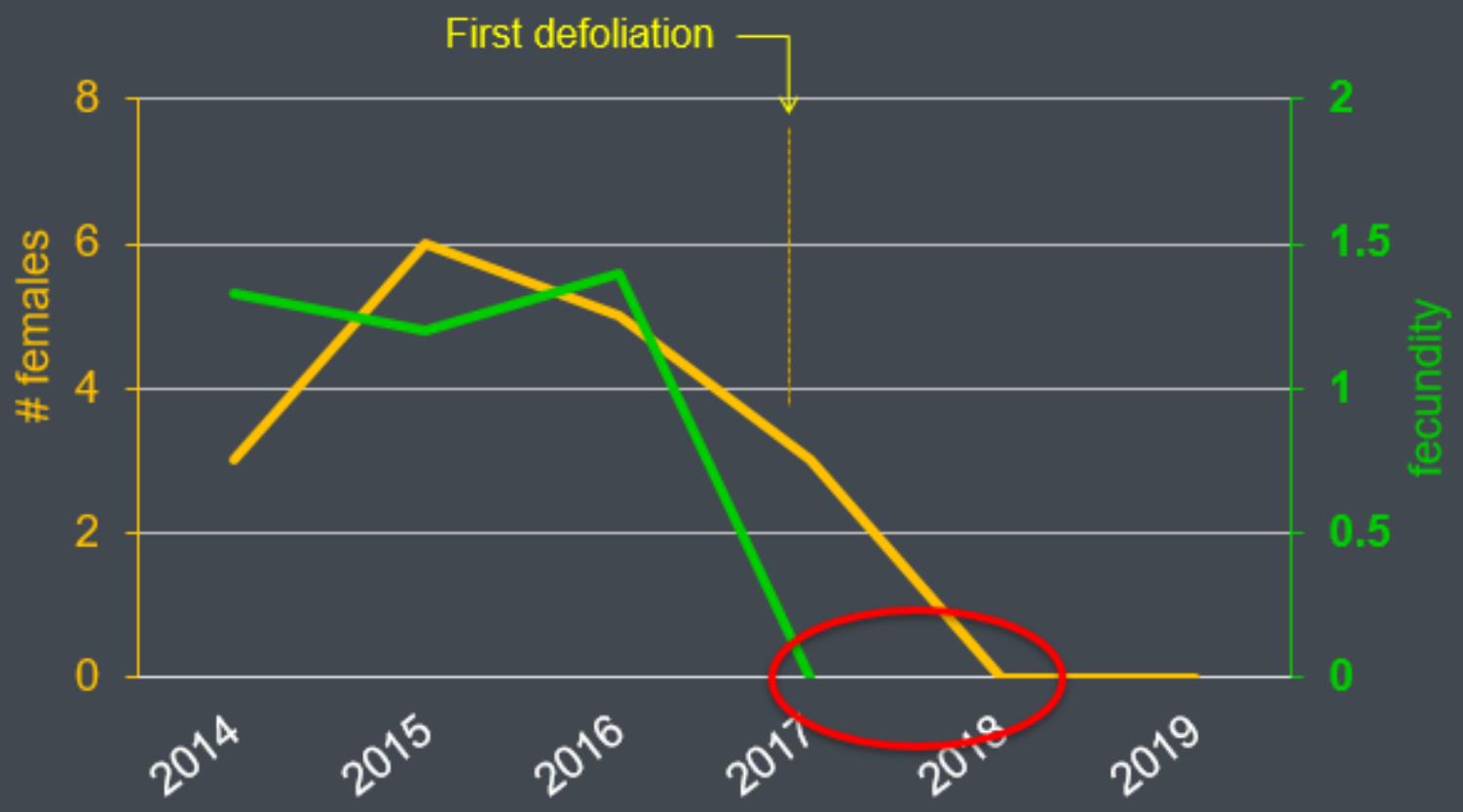
Mid-June 2018

- Bill Williams

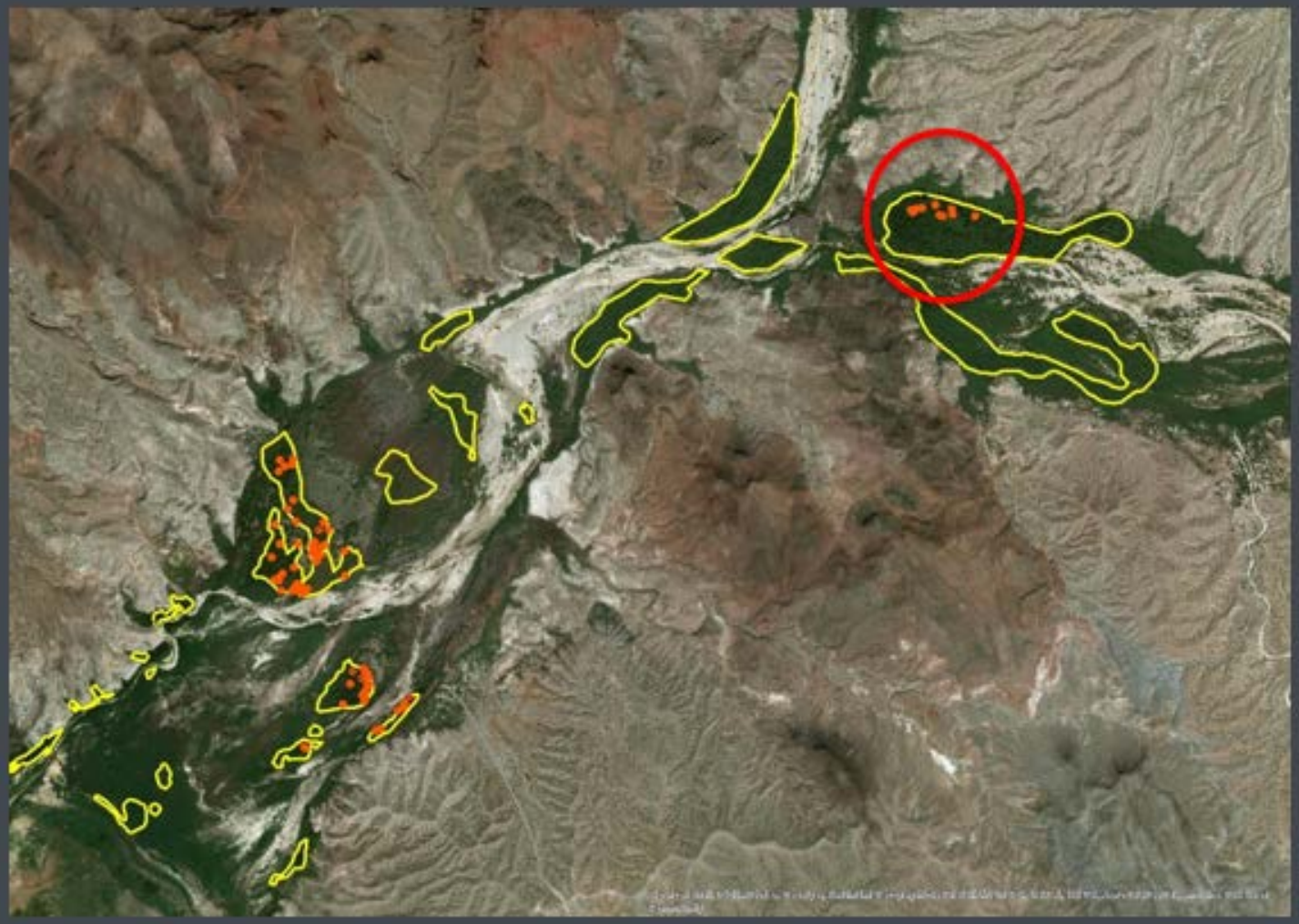
Late May 2019

Mid-July 2019

- Bill Williams – mix of tamarisk and coyote willow



- Alamo Lake



- Alamo Lake

Mid-June 2017

Mid-July 2017

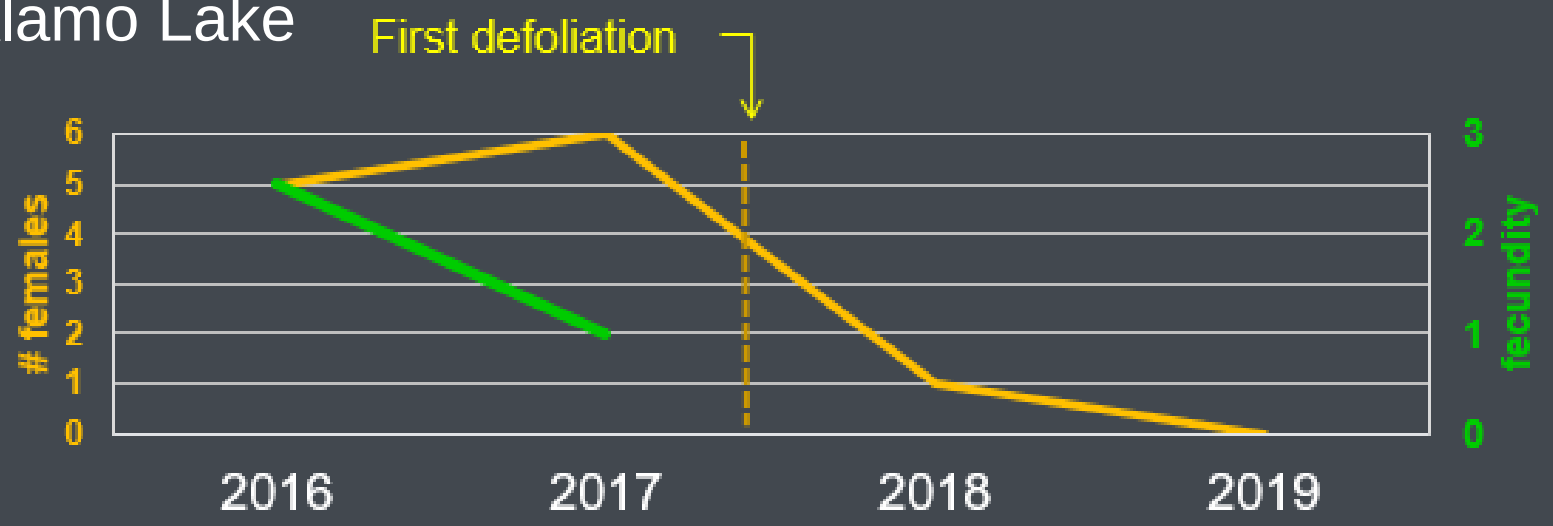
- Alamo Lake

Mid-May 2018

- Alamo Lake

**2019**

- Alamo Lake

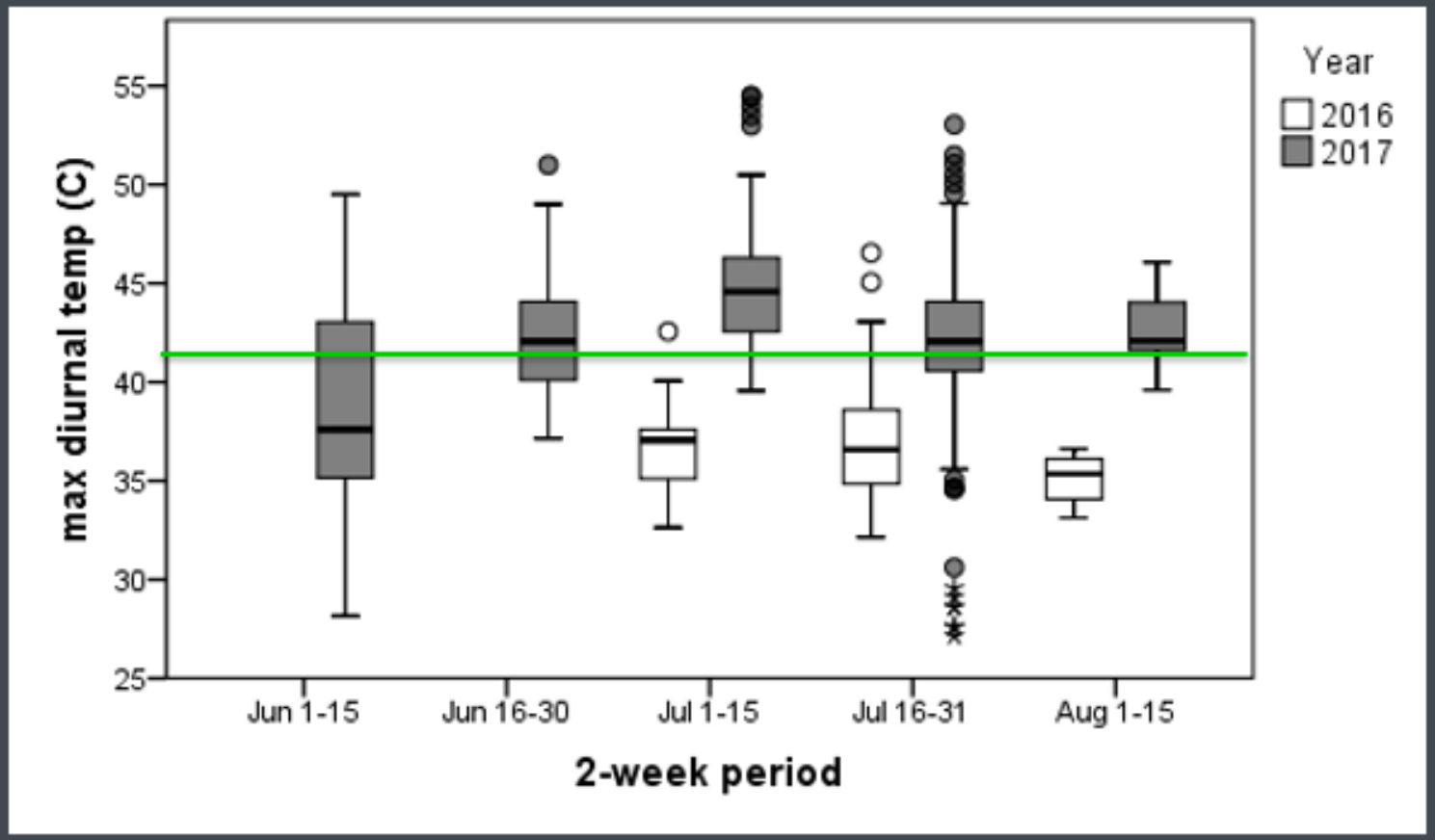



2017 – the only successful nests were early ones; incubation and part of nestling period completed before defoliation

2018 – fecundity unknown (no nest monitoring)

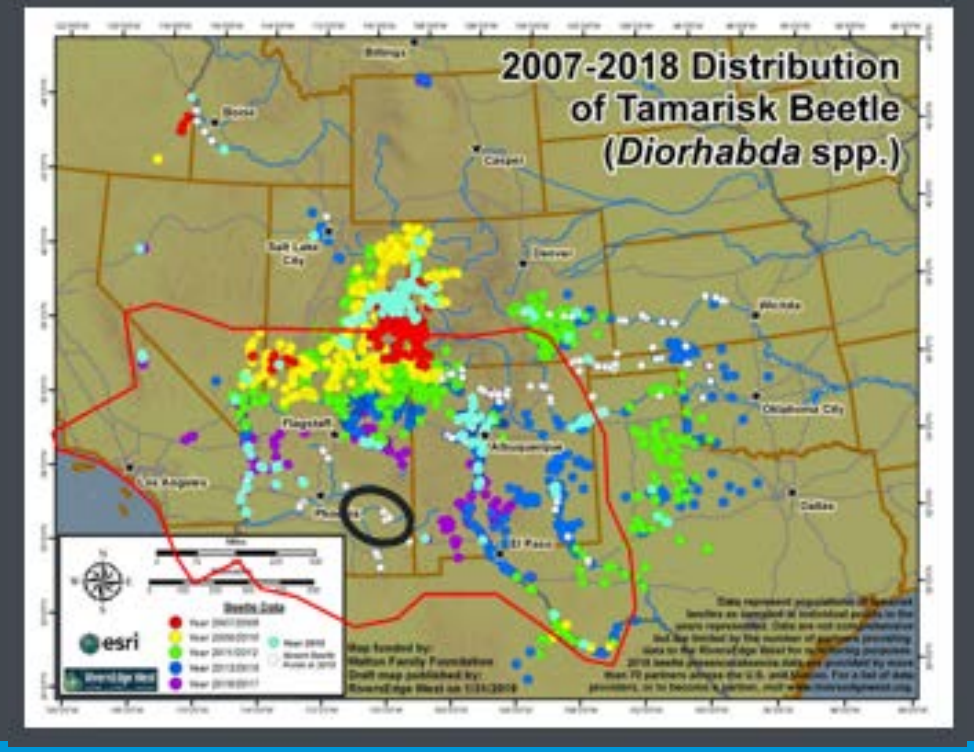
2019 – no flycatchers detected; tamarisk mostly dead

- Alamo Lake - microclimate



# Flycatcher future?

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



# Acknowledgments

Bureau of Reclamation – Boulder City (funding)

Utah Division of Wildlife Resources
Nevada Department of Wildlife
Bird Banding Laboratory
U.S. Fish and Wildlife Service – Southern NV Field Office
RiversEdge West
Clark County
Bureau of Land Management
SWCA Field Crews