EFFECTS OF TAMARISK DEFOLIATION ON SOUTHWESTERN WILLOW FLYCATCHERS
SOUTHWESTERN WILLOW FLYCATCHER

(Empidonax traillii extimus)

- Endangered subspecies of willow flycatcher
- Breed in AZ, NM, and adjacent portion 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

- Water
- Dense veg
- Humid
- Cool

Concealment
Less time & energy on thermoregulation
Eggs less likely to reach lethal temp (41°C = 106°F) \(\text{Webb 1987}\)
**Flycatcher Habitat Preferences**

- **Water**
- **Dense veg**
- **Humid**
- **Cool**

*Increased visibility*
*More time & energy on thermoregulation*
*Eggs more likely to reach lethal temp (41°C = 106°F)*  
Webb 1987
2007-2017 Distribution of Tamarisk Beetle (Diorhabda spp.)

St. George, UT

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 Tamarisk Coalition for monitoring purposes. 2017 beetle presence/absence data were provided by more than 40 partners across the U.S. and Mexico. For a list of data providers or to become a partner, visit www.tamariskcoalition.org.
• Site fidelity strongly affected by nest success
• Active revegetation of riparian areas prior to beetles
• Restoration at old flycatcher sites
RESULTS

2007-2017 Distribution of Tamarisk Beetle (Diorhabda spp.)

Mormon Mesa, NV

 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 Tamarisk Coalition for monitoring purposes. 2017 beetle presence/absence data was provided by more than 40 partners across the U.S. and Mexico. For a list of data providers, or to become a partner, visit www.tamariskcoalition.org. Map funded by: Walton Family Foundation

TAMARISK DEFOliATION AND FLYCATCHERS
RESULTS

Mormon Mesa, NV

Abandonment
Nest desertion during laying

Fewer renests
Parasitism
RESULTS

Mormon Mesa, NV

Abandonment
Nest desertion during laying

Fewer renests
Parasitism

Maybe the Mormon Mesa flycatchers went somewhere else?

• Mormon Mesa had highest adult return rate of 5 areas in southern NV
• 100% site fidelity in 2013
• No new recruits
RESULTS

2007-2017 Distribution of Tamarisk Beetle (Diorhabda spp.)

Topock Marsh, AZ
Alamo Lake, AZ
Bill Williams River, AZ
• Topock Marsh

Mid-May
• Bill Williams
RESULTS

Low water

Topock

Bill Will

# females

fecundity

0 1 2 3 4 5 6


Bill Will

# females

fecundity

0 1 2


TAMARISK DEFOLIATION AND FLYCATCHERS
RESULTS

- Alamo Lake
• Alamo Lake

**Mid-June**

**Mid-July**
• Alamo Lake

RESULTS

First defoliation
RESULTS

• Alamo Lake - microclimate
Flycatcher future?

- Beetles will eventually occupy entire flycatcher range
- Effects locally highly variable
- Decline inevitable
- Long-term prospects
  - Depend on vegetation post-beetle
  - Native recovery?
    - Limited to places retaining suitable conditions
    - Active restoration before and after beetles
- Many other species affected
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