Flycatcher Status Update 2014
The Good, the Unfortunate, and the Surprising

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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
Empidonax trailii extimus

- 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

Along Virgin River at Mesquite

Beaver Dam Wash at Littlefield
Study Components

Territory/nest monitoring
- nest success rates
- causes of failure

Banding/resighting
- survival
- site fidelity
- dispersal

Tamarisk beetle monitoring
- beetle numbers
- veg conditions
- temp/humidity
- light levels
No resident willow flycatchers recorded south of Bill Williams
Pahranagat Valley
Topock Marsh / Bill Williams River NWR

- Six breeding pairs (3 each)
- Nest success 100% (TOPO) & 50% (BIWI); First fledglings since 2010 (TOPO) and 2011 (BIWI)
- No parasitism (!) but low sample size
- TOPO pairs in recently expanded habitat on marsh edge
- Two of three BIWI pairs in relatively new coyote willow habitat near river delta
Alamo Lake

- Large number of resident flycatchers (56)
- Low nest success (25%)
- Low fecundity (0.42 fledglings / female)
- Poor habitat conditions:
  - Driest study area with breeding flycatchers in 2014
  - Early leaf abscission noted in some breeding areas
  - Microclimate noticeably hotter and less humid than TOPO/ BIWI
Alamo Lake

Graph showing the water level of Alamo Lake from 1995 to 2015. The lake level has been decreasing overall, with fluctuations in the early 2000s.
Study Design

Permanent monitoring points located in recently occupied habitat at four study areas:

- **Mesquite (MESQ)** – Not monitored in 2014
- **Mormon Mesa (MOME)** – Not monitored in 2014
- Topock Marsh (TOPO)
- Bill Williams River NWR (BIWI)
Study Design

Points were randomly distributed among available vegetation types:

- Tamarisk (TASP)
- Tamarisk with emergent Goodding Willow (TASP_SAGO)
- Goodding Willow overstory with Tamarisk understory (SAGO_TASP)

**Topock Marsh**
- TASP .................... (10 points)
- TASP_SAGO .......... (10 points)

**Bill Williams River NWR**
- SAGO_TASP ......... (15 points)

5 photo points in each study area
- Each photo point strategically placed with view of tamarisk
Study Design

At each monitoring point, we monitored:

- **Temperature and Relative Humidity**
  using a Hygrochron iButton

- **Light Intensity (lux)**
  using a HOBO Pendant® temperature/light data logger

- **Beetle Populations**
  abundance estimates by life stage (adults, larvae, and egg clusters)

- **Vegetation**
  recorded visual estimations of foliar color (% green, % yellow, % brown) and % leafless stems. Also measured % total canopy closure using a Model-A spherical densiometer.

Monitoring schedule:

- Bi-weekly in the absence of beetles
- Weekly if beetles were detected
Results

NO BEETLES!
Lessons Learned in 2013

Observer Variation –

- Unknown amount present in data as well as possible seasonal drift
- reduced ability to draw conclusions on what is real change
Calibration Exercise

• Group training in data collection techniques prior to calibration

• **Beginning of Field Season:**
  • Group calibration with one experienced observer prior to data collection
    • Five monitoring points (4 in TASP_SAGO; 1 in TASP)
    • Each technician collected data independently
    • Group discussion of results at each point with consensus before moving to next point

• **End of Field Season:**
  • Group calibration at same five monitoring points
  • Data collected independently
  • No discussion of results
Results
Calibration Exercise

Charts show the percentage of canopy closure and green foliage at different beetle point numbers (TM-1 to TM-3) at the beginning and end of the calibration exercise.
Results
Calibration Exercise

[Graphs showing the percentage of TASP within 2 m and 5 m for different beetle points.]
Results
Calibration Exercise

% TASP within 2 m

% TASP within 5 m
Lessons Learned
Calibration Exercise

• Initial pre-calibration training insufficient
• Calibration reduced observer variation
• Vegetation structure influences ability to estimate some measures
  • Need to expand calibration to include multiple vegetation types
• Percent tamarisk hard to estimate, especially at 5 m
• Unable to differentiate between seasonal drift and real changes in vegetation
• End calibration useful for identifying protocol-level errors
Results

• 2013 - Evidence of vegetation damage presumed from weevils seen in several places in Topock Marsh.
• 2014 – damage not as evident
Results

- Canopy closure more similar between veg types in 2014
Results

- Hotter in tamarisk in 2013
- Temperature more similar between veg types in 2014
Results

• Brighter in tamarisk in 2013
Light loggers

• 2013 was a pilot year:
  • our light loggers are not meant to be in direct sun…
• 2014 - control logger housing change monthly
  • Corrected the issue at Topock, but the Bill?
Light loggers
Light loggers

- Potential causes of change in recorded light levels:
  - Deviation of the logger from horizontal
  - Accumulation of dirt / debris on logger housing

6 degree angle
• 6 degree deviation from horizontal makes a difference
• This difference most pronounced in sunny conditions
• Need to use levels in 2015 to ensure loggers are horizontal
Light loggers

- Logger cleanliness might affect readings early / late in the day, but only if REALLY dirty.
- Mildly dirty loggers indistinguishable from each other
- Will clean loggers at each visit in 2015, regardless
Light loggers

**0900 - 0910**

![Graph showing Mean Lux from 0900 to 0910 with data points and error bars.](image)

**1200 - 1210**

![Graph showing Mean Lux from 1200 to 1210 with data points and error bars.](image)
Questions?