Southwestern Willow Flycatcher status and habitat restoration efforts on the Virgin River in St George, Utah

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Washington County Field Office
Utah Division of Wildlife Resources

Southwestern Willow Flycatcher

Empidonax traillii extimus

Breeding Habitat

- Lowland riparian forest
  - Early successional
  - Heterogeneous structure
  - Dense vegetation 2-4 m height
- Associated with water
  - Still–slow moving; saturated soil

Southwestern Willow Flycatcher

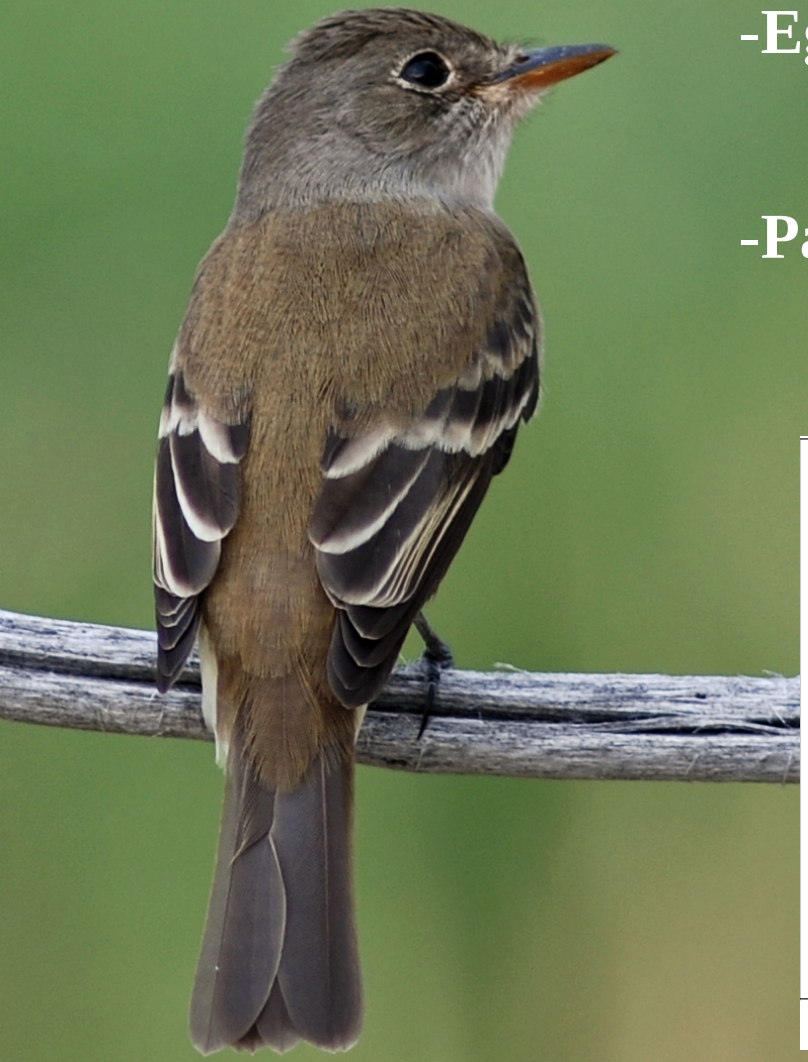
Empidonax traillii extimus

Breeding Biology

- -Territorial
  - -Territory size 0.2 – 0.5 ha
- -Monogamous… mostly
- -Nests
  - -Female builds
  - -Compact cup of grasses, plant fibers
  - -Fork of tree, 2–5 m above ground

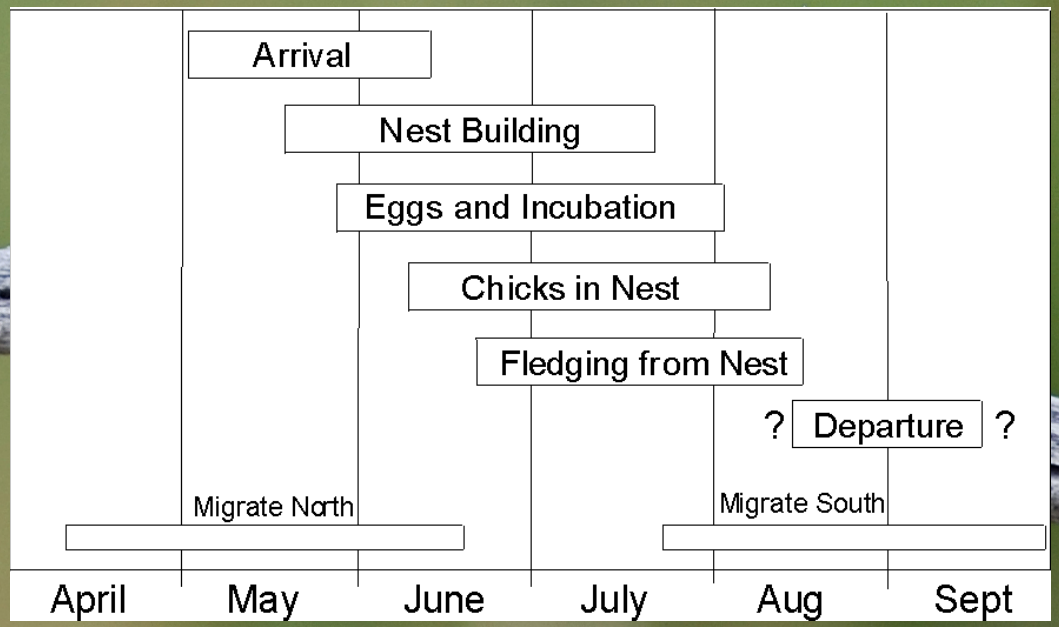
Southwestern Willow Flycatcher

Empidonax traillii extimus

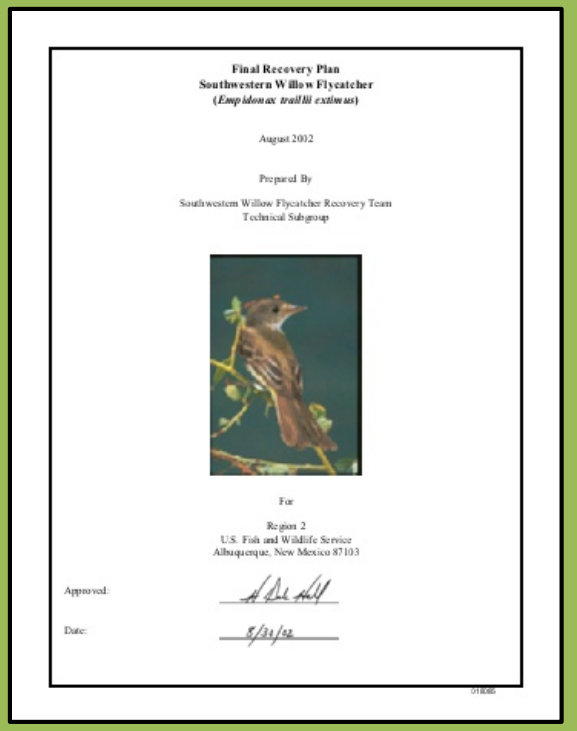


Breeding Biology

- **-Eggs**
  - -Clutch size 2–4 eggs
  - -Female incubates, 12–13 d
- **-Parental care**
  - -Male & female feed nestlings, 12–15 d
  - -Fledglings remain in territory 14+ d



Southwestern Willow Flycatcher Recovery Plan (USFWS. 2002)


Final Recovery Plan
Southwestern Willow Flycatcher
(*Empidonax traillii extimus*)

August 2002

Prepared By

Southwestern Willow Flycatcher Recovery Team
Technical Subgroup

For

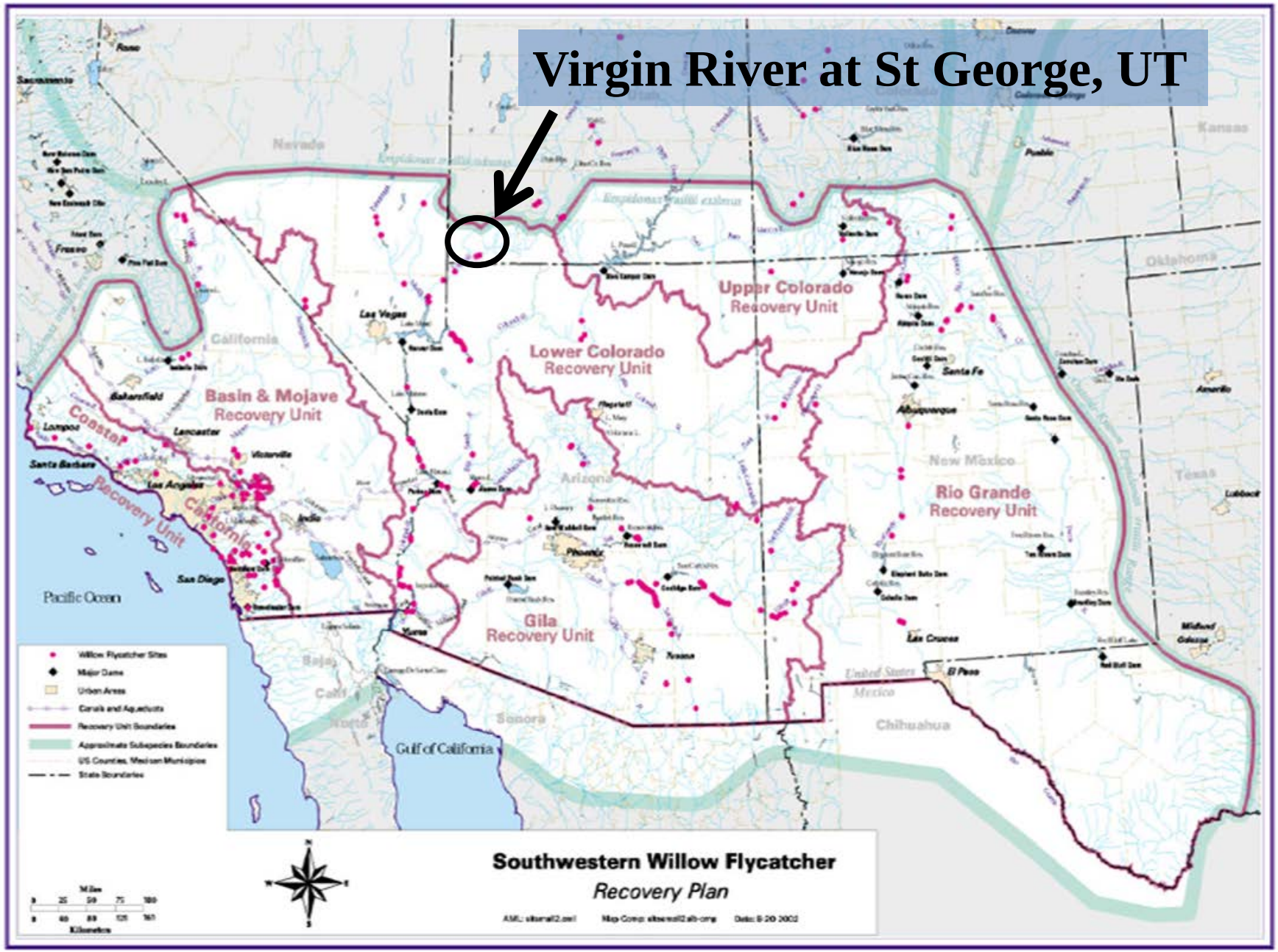
Region 2
U.S. Fish and Wildlife Service
Albuquerque, New Mexico 87103

Approved:

Date: 8/31/02

- Purpose:
  - Establish recovery goals and objectives
  - Recommend site-specific management
  - Estimate time and cost

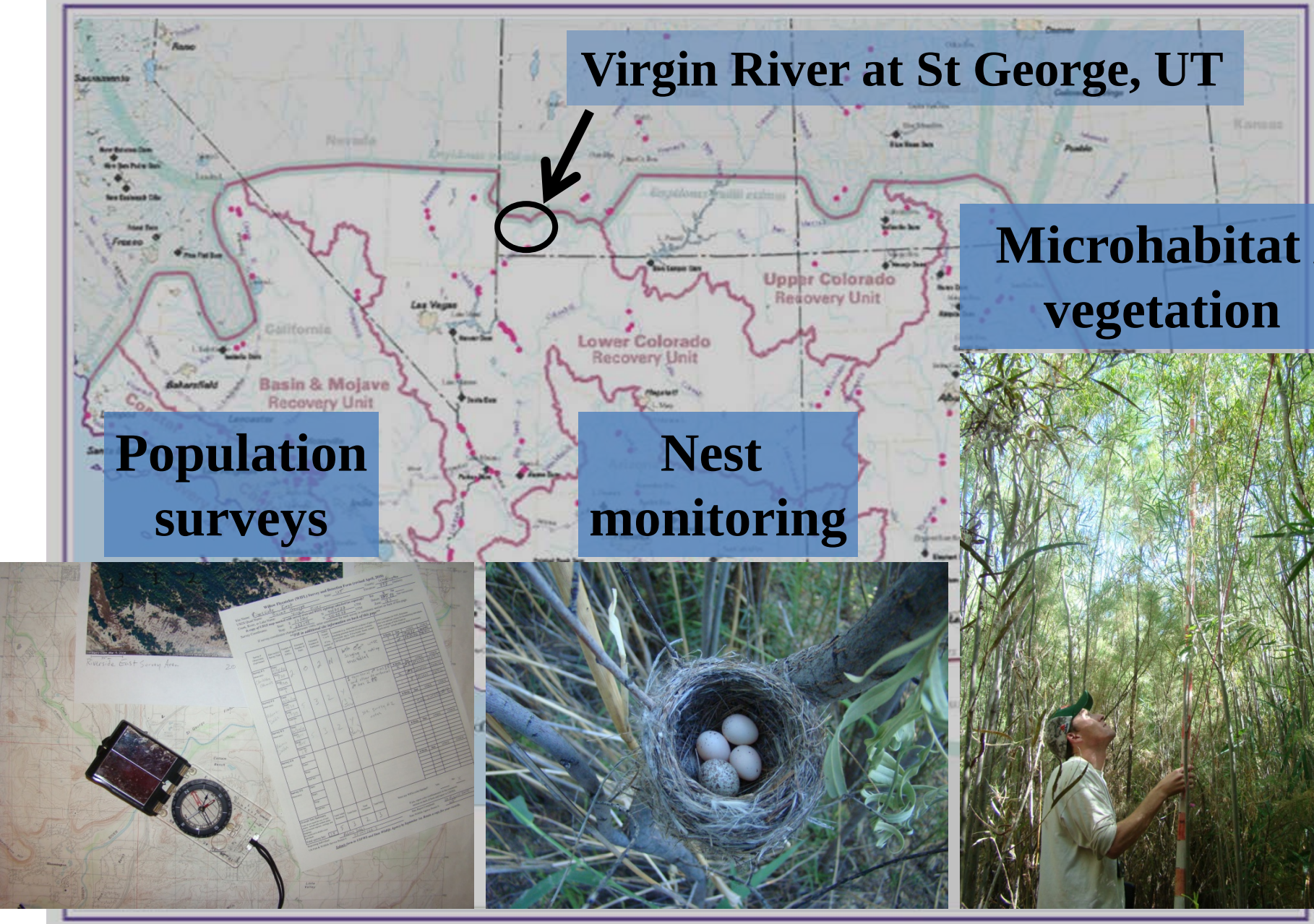
- Six Recovery Units established
  - Encompass the extant of breeding range, which includes seven States (AZ, CA, CO, NV, NM, TX, UT)
  - Based on large watershed and hydrologic units (i.e. river basin boundaries)
  - Further subdivided into Management Units
    - Based on small hydrologic units (i.e. river drainages)
    - Include specific river reaches
    - 4-7 Management Units located within Recovery Units


Virgin River at St George, UT
Upper Colorado Recovery Unit
Lower Colorado Recovery Unit
Basin & Mojave Recovery Unit
Coastal California Recovery Unit
Gila Recovery Unit
Rio Grande Recovery Unit
Nevada
California
Arizona
New Mexico
Texas
Oklahoma
Kansas
Colorado
Pacific Ocean
Gulf of California
Las Vegas
Phoenix
Albuquerque
Santa Fe
El Paso
Los Angeles
San Diego
Fresno
Bakersfield
Lancaster
Victorville
Sacramento
Reno
Pueblo
Amarillo
Lubbock
Midland
Odessa
Las Cruces
Sonora
Chihuahua
Willow Flycatcher Sites
Major Dams
Urban Areas
Canals and Aqueducts
Recovery Unit Boundaries
Approximate Subspecies Boundaries
US Counties, Mexican Municipios
State Boundaries
Southwestern Willow Flycatcher
Recovery Plan

St George Study Area

- Lower Colorado Recovery Unit
- Virgin Management Unit
  - Lower Santa Clara River from Pine Valley to Virgin River (UT)
  - North Fork of Virgin River in Zion NP to East Fork of Virgin River (UT)
  - Virgin River from Rockville to Beaver Dam Wilderness Area (UT)
  - Virgin River from Littlefield (AZ) to Lake Mead (NV)
- Critical Habitat designation (UT)
  - Berry Springs downstream to AZ state line (29.5 mi)
  - **Utah DWR monitoring**:
    - 5.5 mi within Washington City and St George
    - Additional surveys near Santa Clara City and Hurricane

UDWR monitoring (2008-2016)



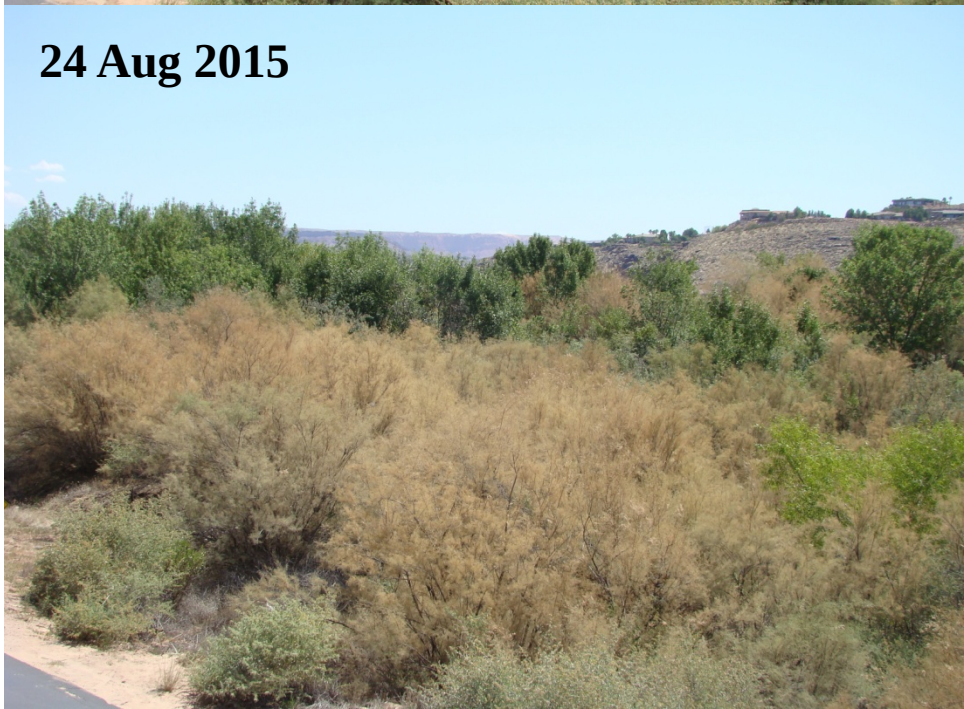
Tamarisk Leaf Beetles (*Diorhabda carinulata*) in St George

Tamarisk Leaf Beetles (*Diorhabda carinulata*) in St George

- **Introduced in 2006**
- **Tamarisk defoliation:**
  - **2008: August, *after* SWFL breeding**
  - **2009: June**
  - **2010: June**

  ] ***peak*** **SWFL breeding**
  - **2011: late July**
  - **2012: late July**
  - **2013: late July**
  - **2014: late July**
  - **2015: late Aug**

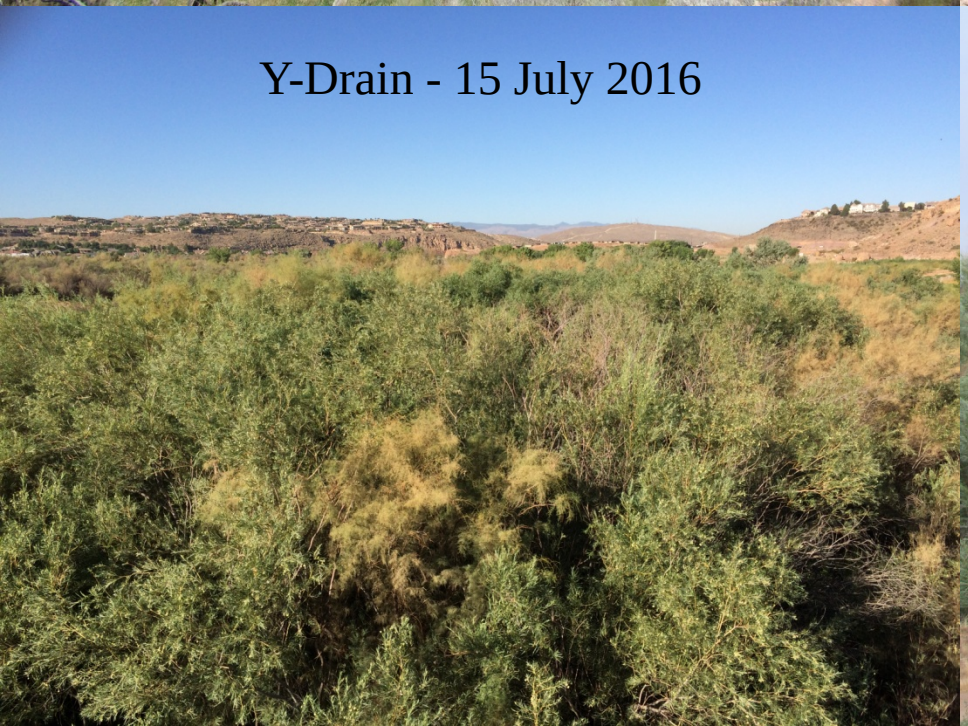
  ] ***after*** **SWFL breeding**
  - **2016: varied**



AWFD - 10 June 2016

Seegmiller - 10 June 2016

Y-Drain - 15 July 2016



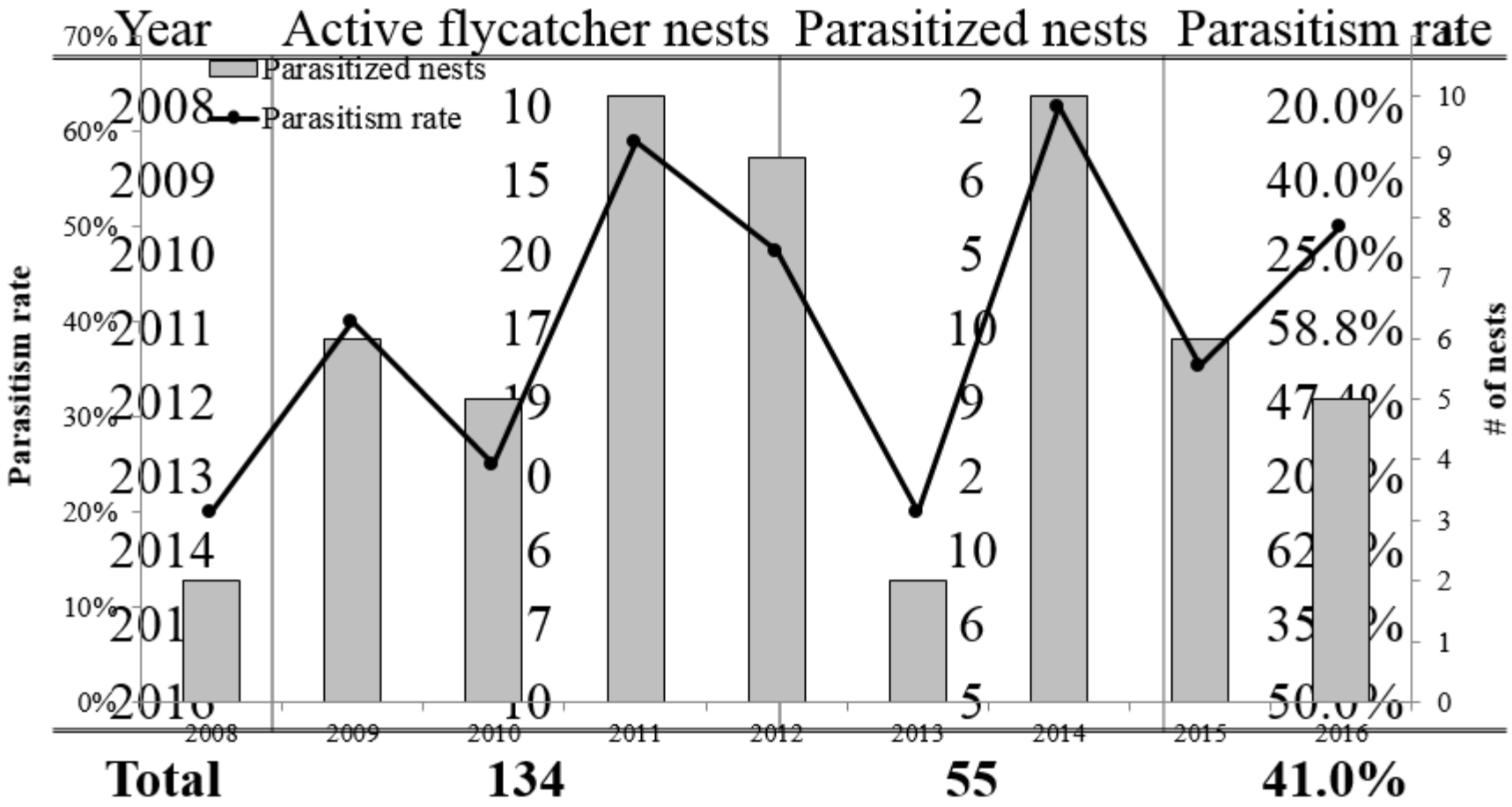
Snipe Pond - 4 Aug 2016

Beetle-induced tamarisk defoliation

- Affects nest site microclimate
  - Higher temp, Lower RH
  - Decrease hatching success
- Affects nest concealment
  - Increase predation
  - Increase brood parasitism

Brown-headed Cowbird Parasitism

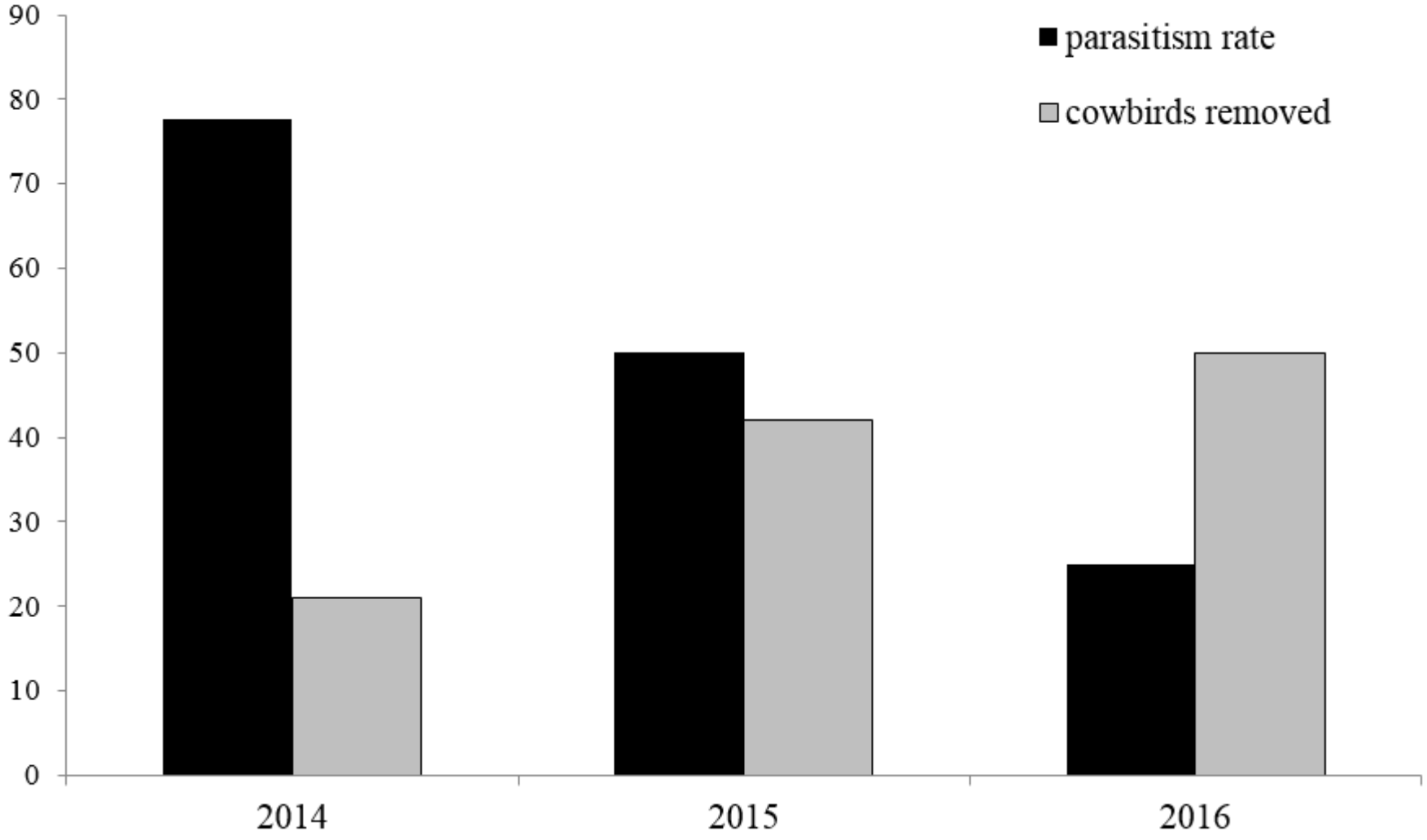
Brown-headed Cowbird Parasitism

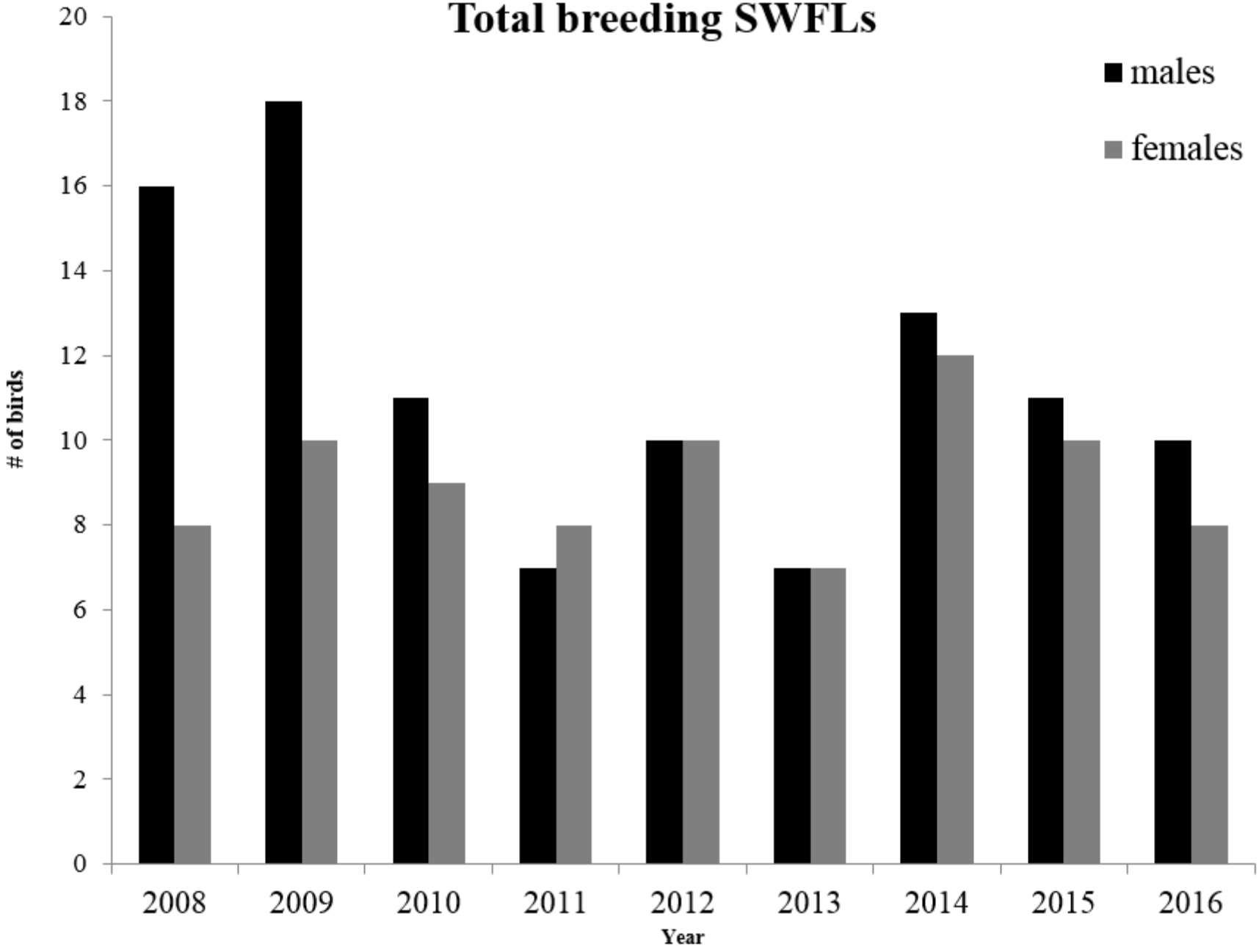


Brown-headed Cowbird Control

- **2013** = 53 cowbirds removed
  - Snipe Pond and Y-Drain Marsh
- **2014** = 65 cowbirds removed
  - Riverside Marsh and Schmutz Drain
- **2015** = 70 cowbirds removed
  - Riverside Marsh and Schmutz Drain
- **2016** = 77 cowbirds removed
  - Riverside Marsh and Schmutz Drain
- **Total 2013-16 = <u>265 cowbirds</u>**

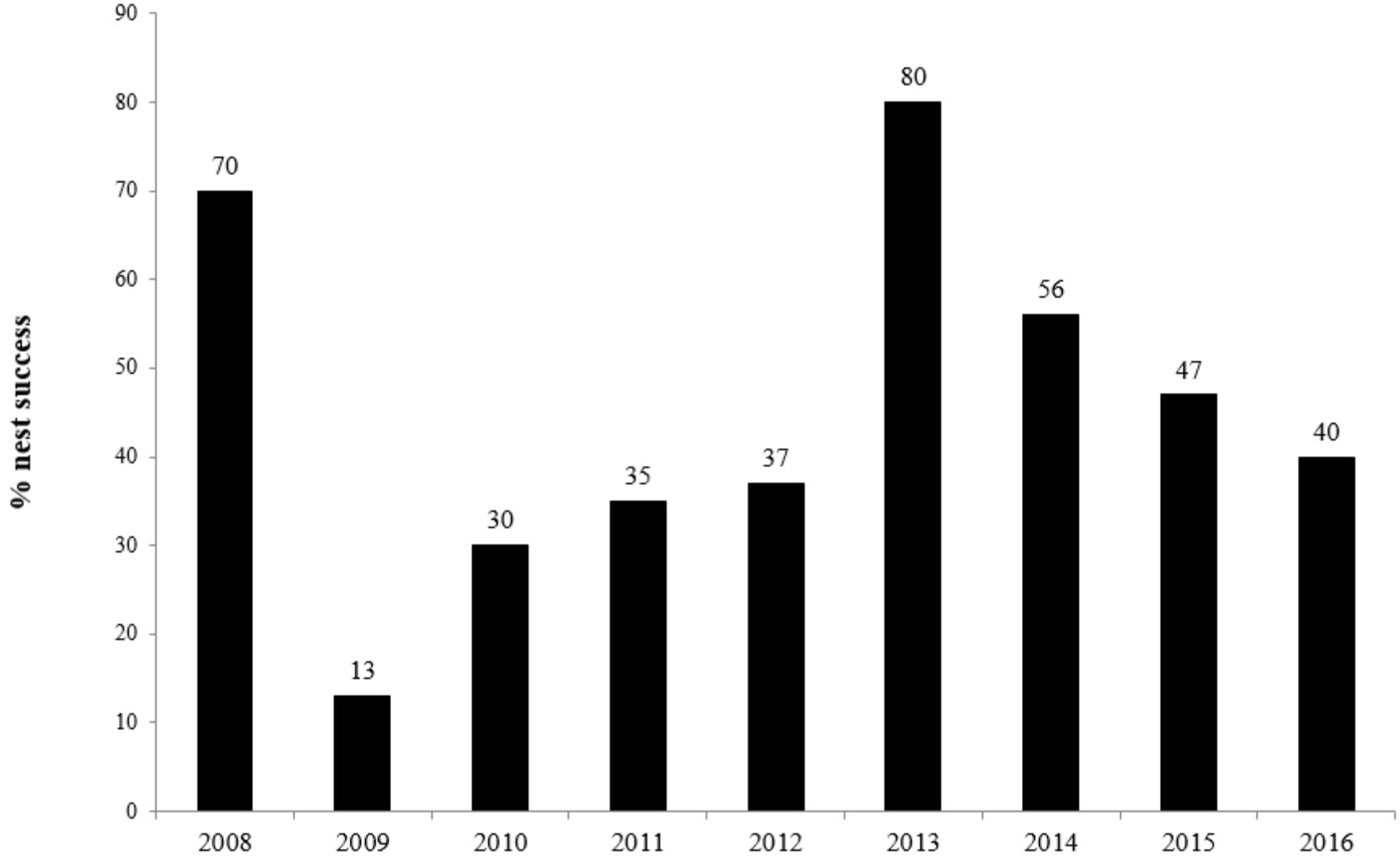
Cowbird Control 2014-2016 – Schmutz Drain




Total breeding SWFLs
males
females
# of birds
20
18
16
14
12
10
8
6
4
2
0
2008
2009
2010
2011
2012
2013
2014
2015
2016
Year

Apparent nest success

(% of active nests producing at least 1 SWFL fledgling)



2016

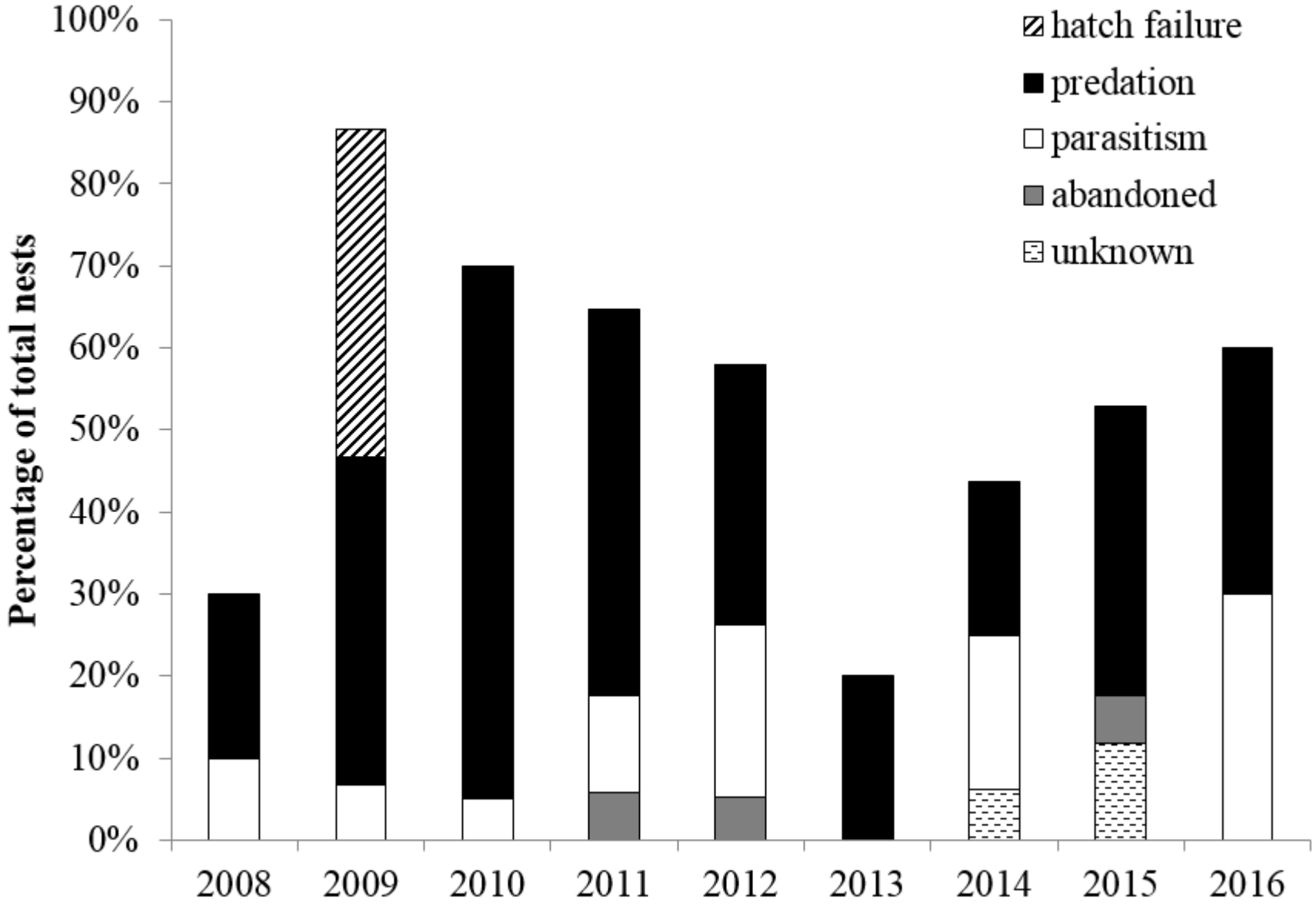
Site	Active nests[1]	Parasitized nests	Failed nests	Successful nests[2]	Total fledglings
Riverside Marsh	1	0	1	0	0
Riverside East	0	-	-	-	-
River Road Bridge	0	-	-	-	-
Seegmiller Marsh	3	0	0	3	11
Y-Drain Marsh	6	5	5	1	3
Snipe Pond	0	-	-	-	-
All sites combined	**10**	**5**	**6**	**4**	**14**

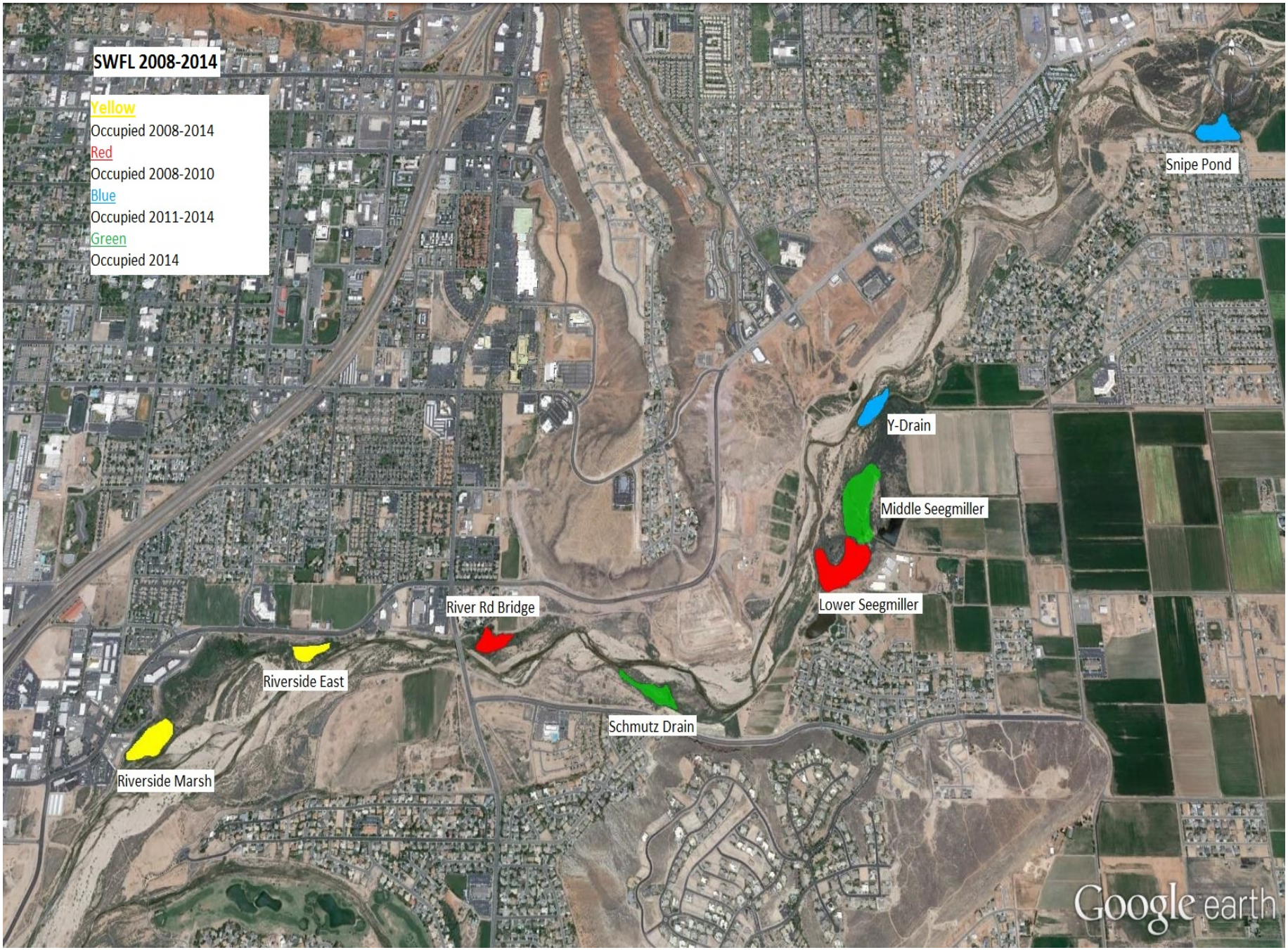
[1] Nests with confirmed Southwestern Willow Flycatcher eggs or nestlings.
[2] Nests producing ≥ 1 fledgling.

Total fledglings (2008-2016)

year	active nests	fledglings
2008	10	16
2009	15	2
2010	20	12
2011	17	14
2012	19	14
2013	10	18
2014	16	18
2015	17	15
2016	10	14

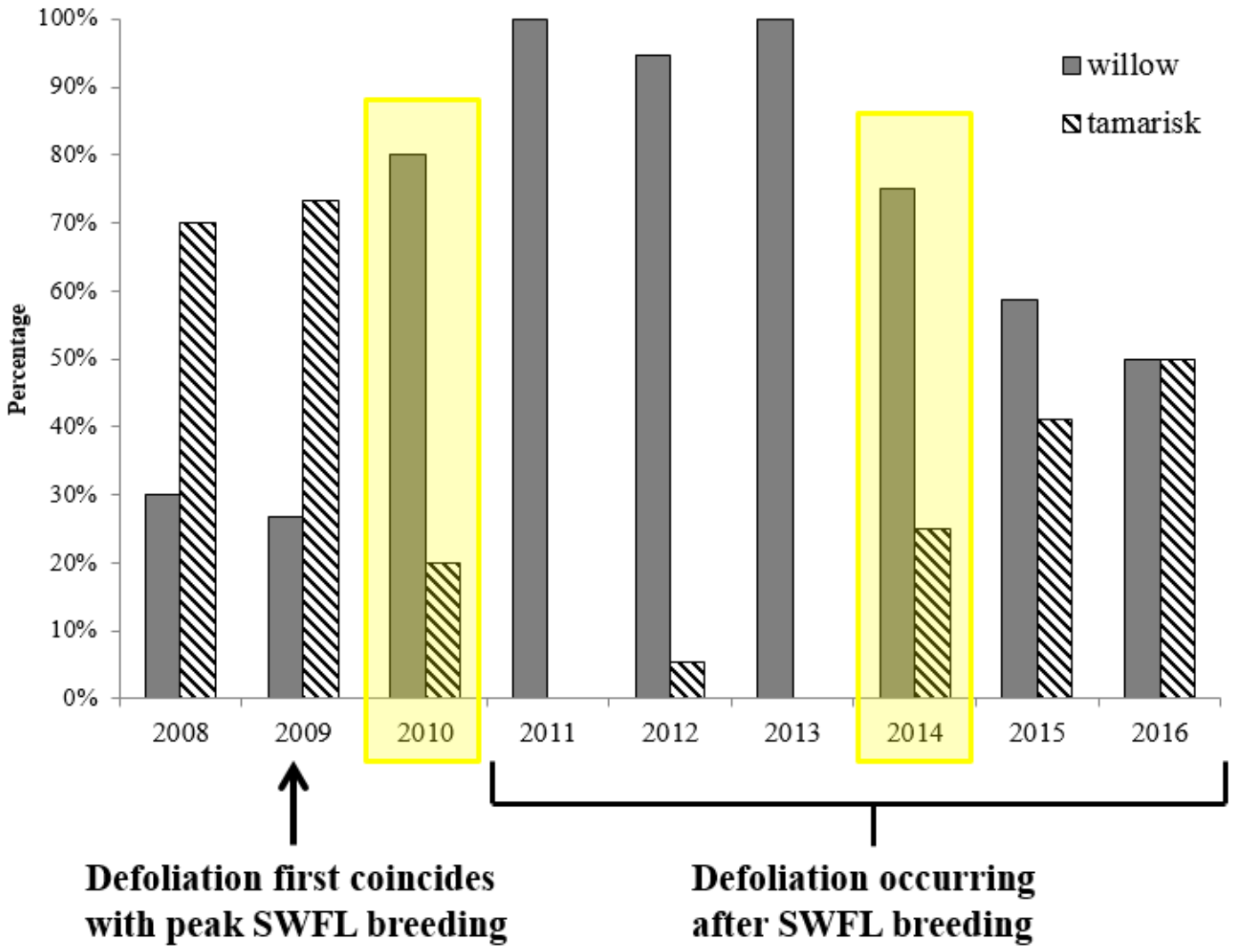
Cause of Failure




SWFL 2008-2014
Yellow
Occupied 2008-2014
Red
Occupied 2008-2010
Blue
Occupied 2011-2014
Green
Occupied 2014
Snipe Pond
Y-Drain
Middle Seegmiller
Lower Seegmiller
River Rd Bridge
Riverside East
Schmutz Drain
Riverside Marsh
Google earth

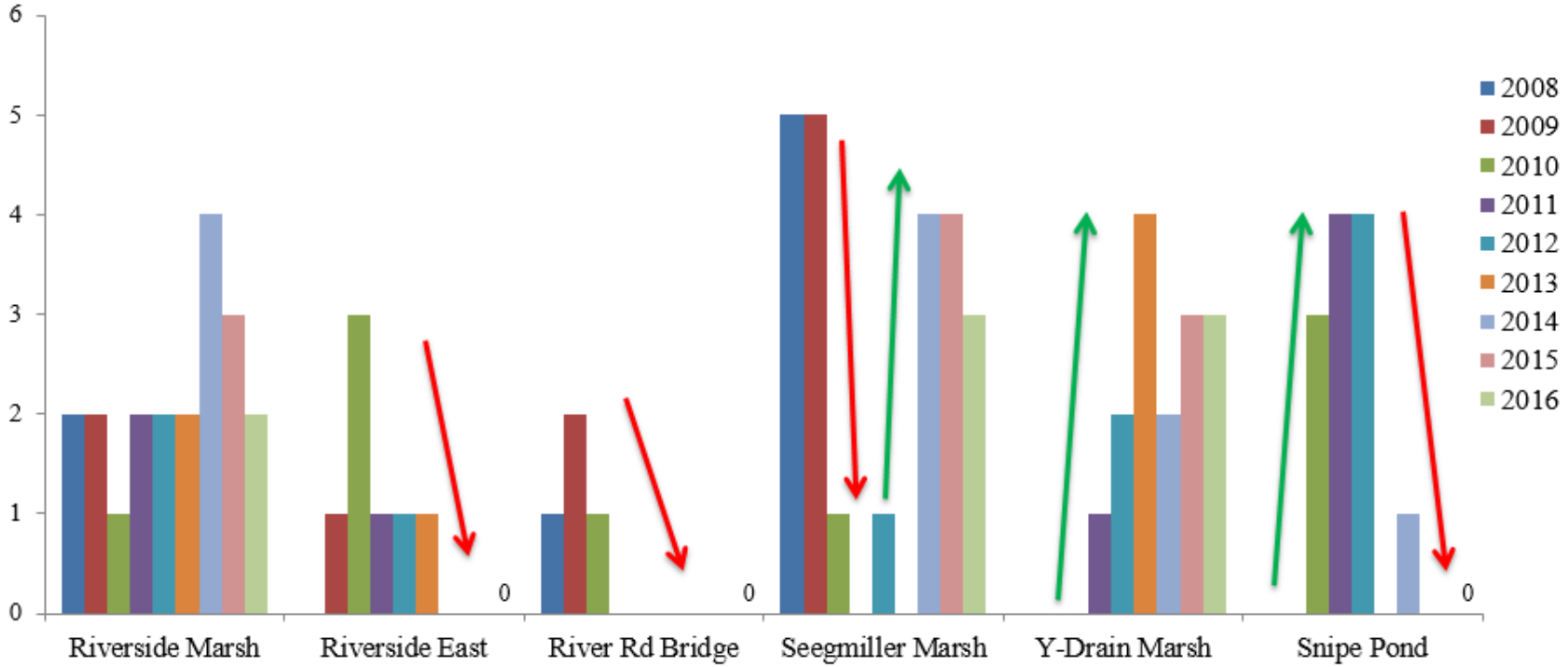
Habitat use shifts (2010, 2014)

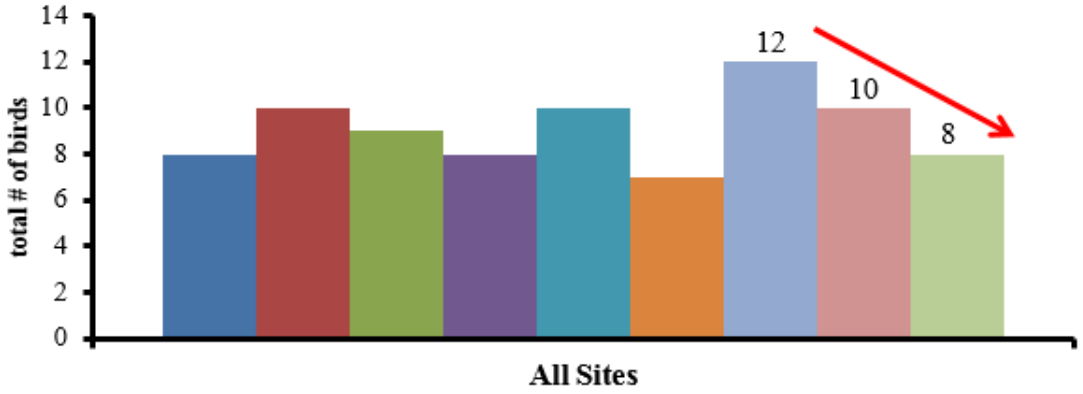
-- nest site dominant species (5m-radius)



SWFL numbers in St George, 2008-2016

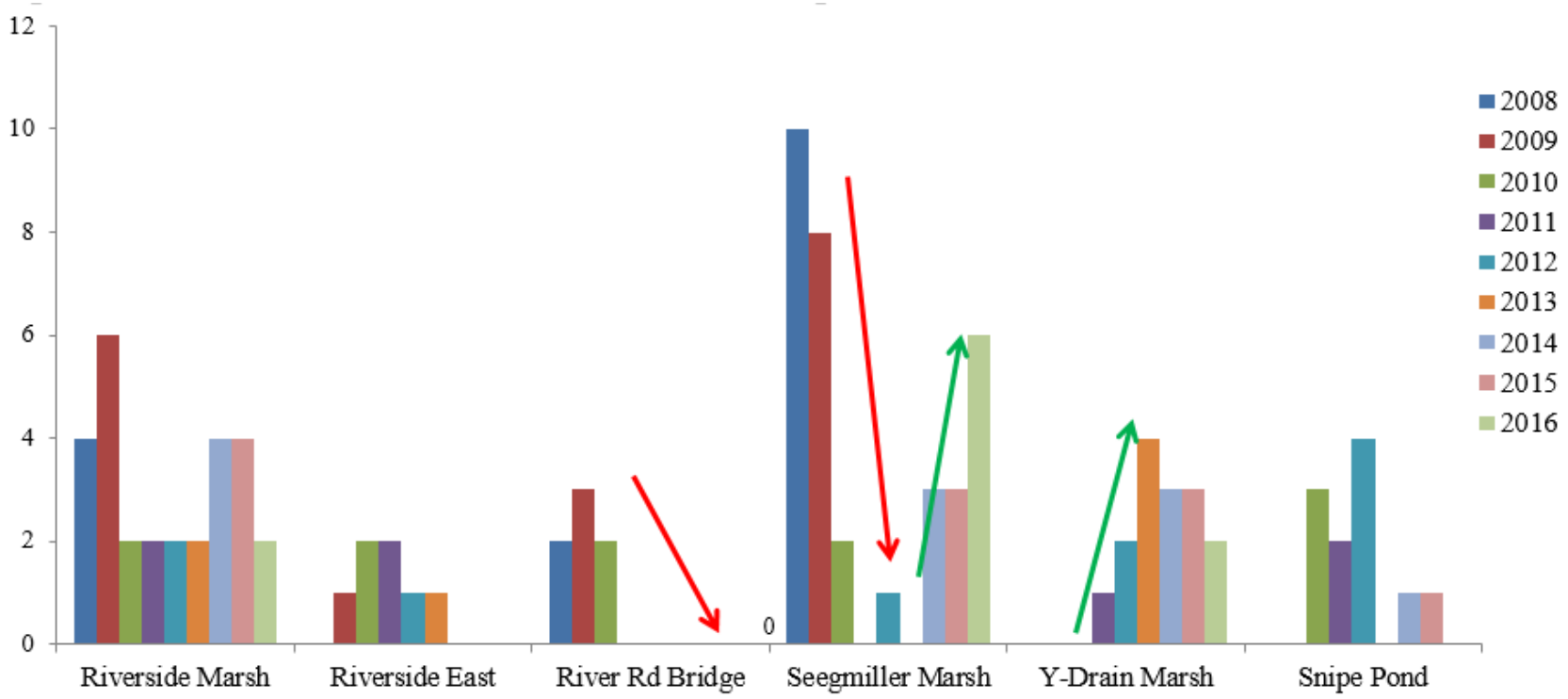
Females distribution shift; overall minimal change, 2014-16 decrease

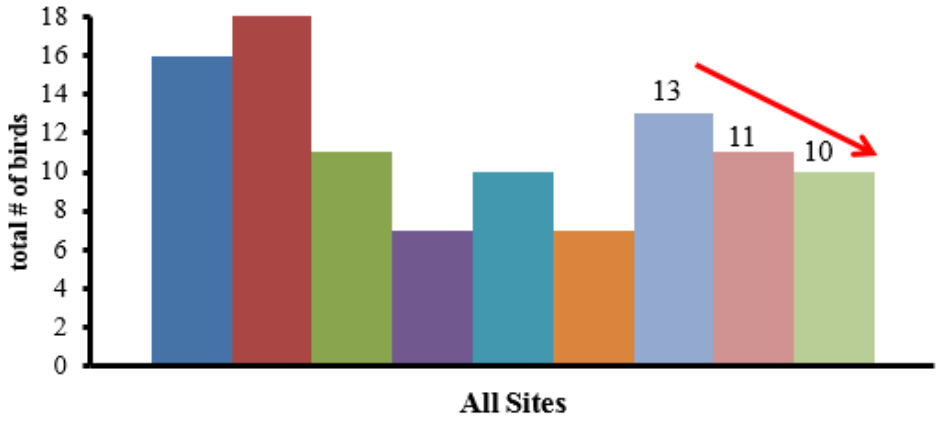




SWFL numbers in St George, 2008-2016

<u>Males</u> distribution shift; overall decline since 2009; 2014-16 decrease



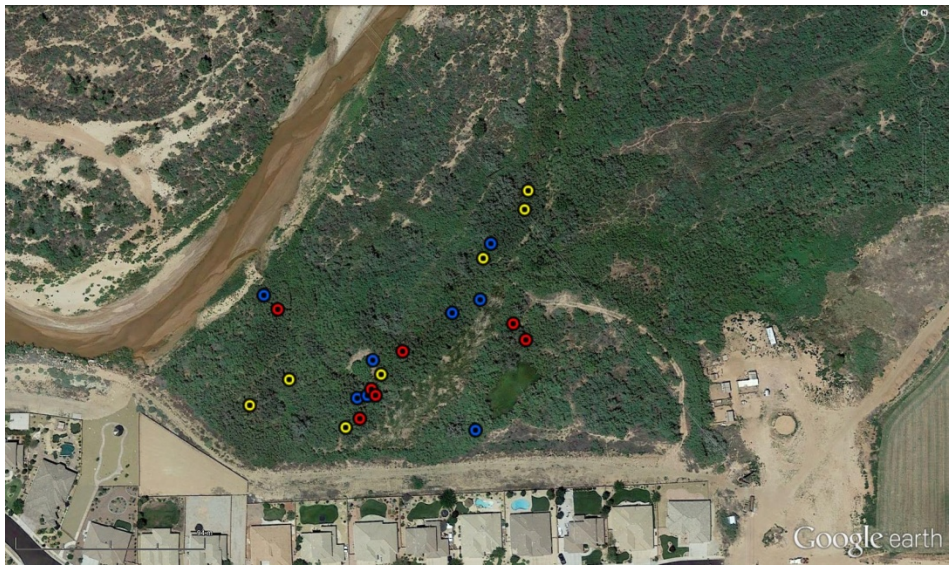


Seegmiller Marsh
-tamarisk dominated

Snipe Pond
-willow dominated

2008-2009:

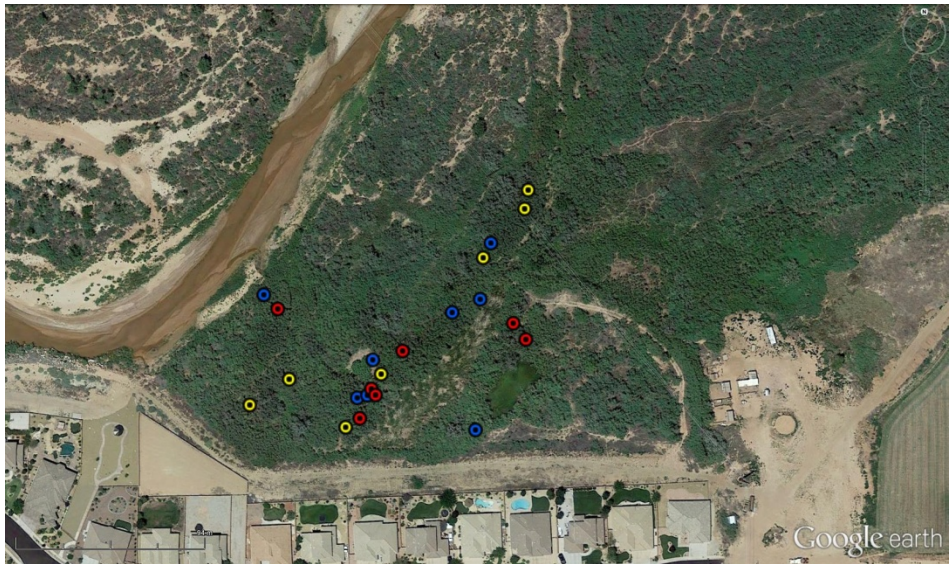
2010-2013:



Seegmiller Marsh
-tamarisk dominated

Snipe Pond
-willow dominated

2010-2013:



2014-2016:

Recommended Recovery Actions

- **1: Increase and improve currently and potentially suitable habitat**
  - Secure. Enhance. Restore.
- **6.1: Determine habitat characteristics that influence occupancy and reproductive success**
  - Plant species / habitat structure
    - Use vs. availability of exotic & native plant species
  - Microhabitat / microclimate

Microhabitat questions

-Do SWFL select microhabitat features?

- **-Compare vegetation at nests & nonuse sites**
- **-Compare nest substrate use given availability**

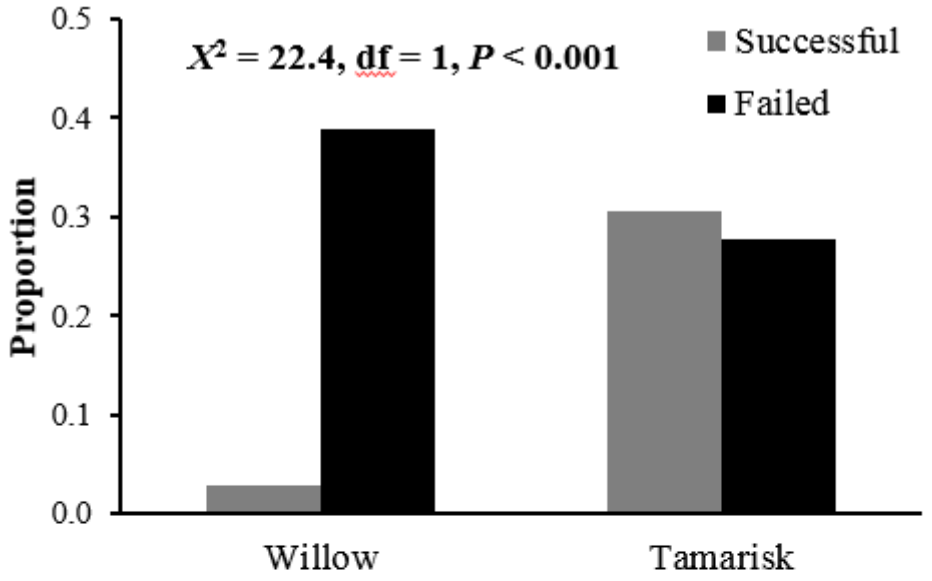
-Are microhabitat features associated with nest success?

- **-Compare nest substrate use at successful and unsuccessful nest sites**
- **-Compare vegetation at successful and unsuccessful nest sites**

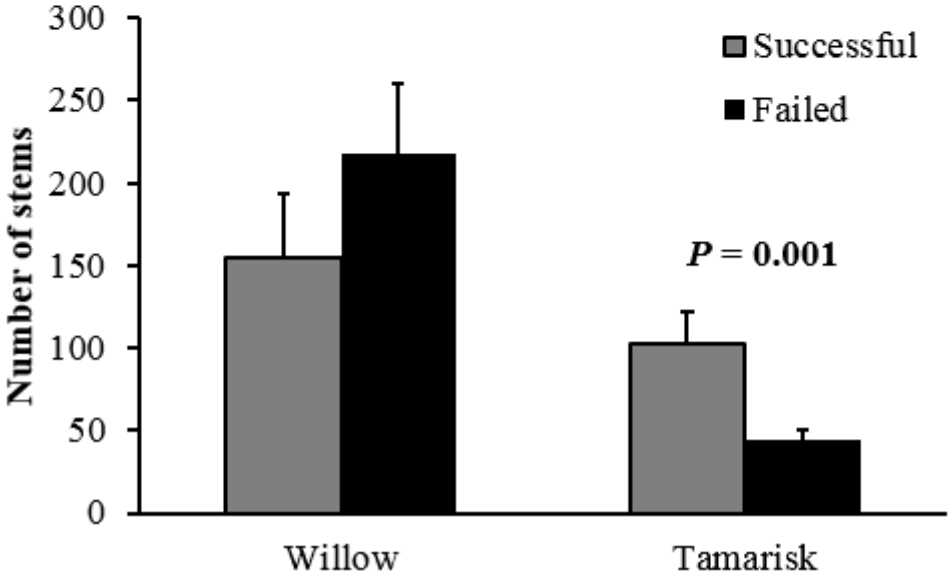
-What do results suggest about habitat restoration and enhancement?

Nest success habitat-mediated (2010-2011)

Nests more likely to fledge in tamarisk than willow substrates



Nests more likely to fledge with higher tamarisk shrub density



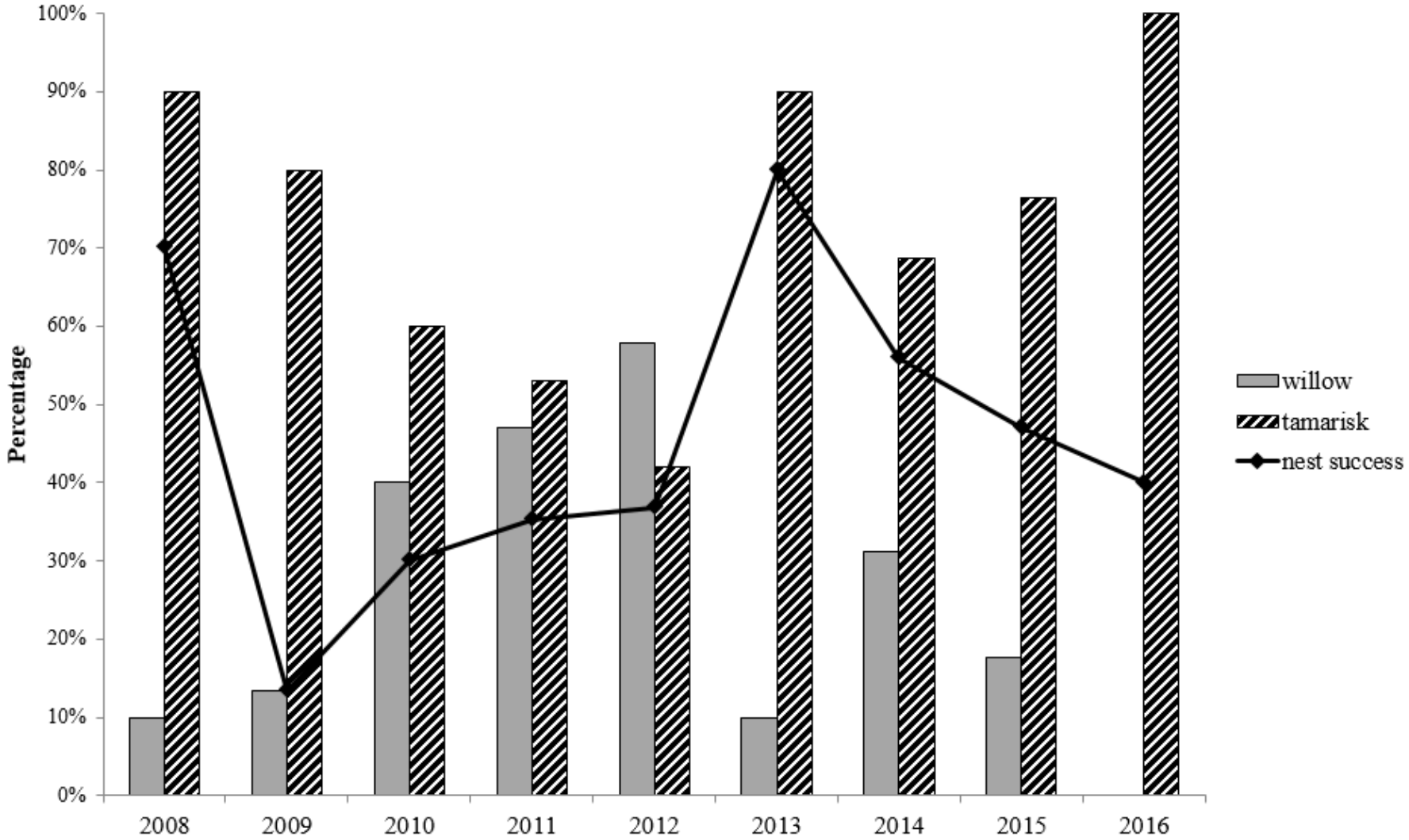
Nest concealment may contribute to nest success if visual (avian) predators important

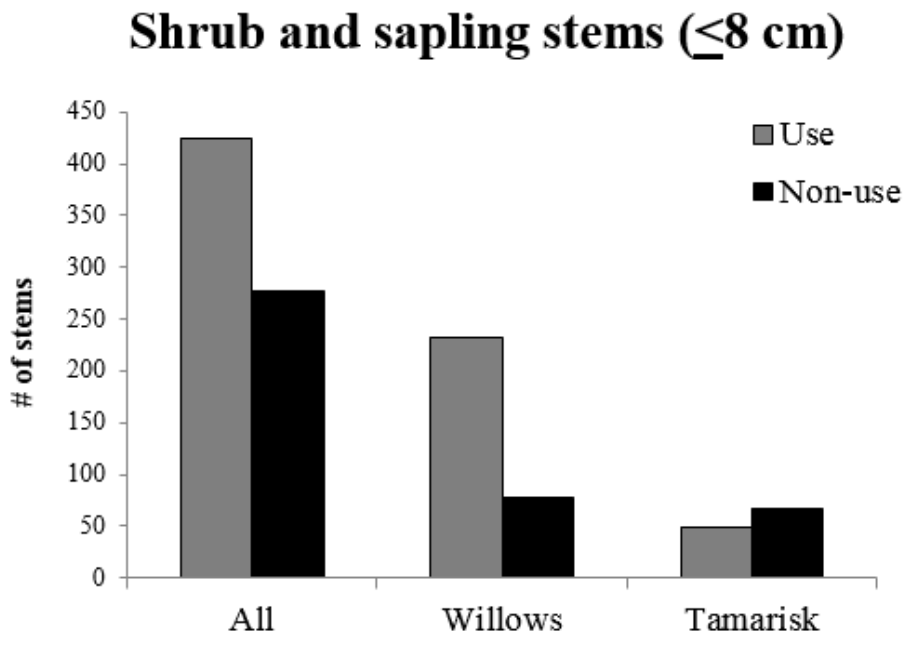
Coyote willow only

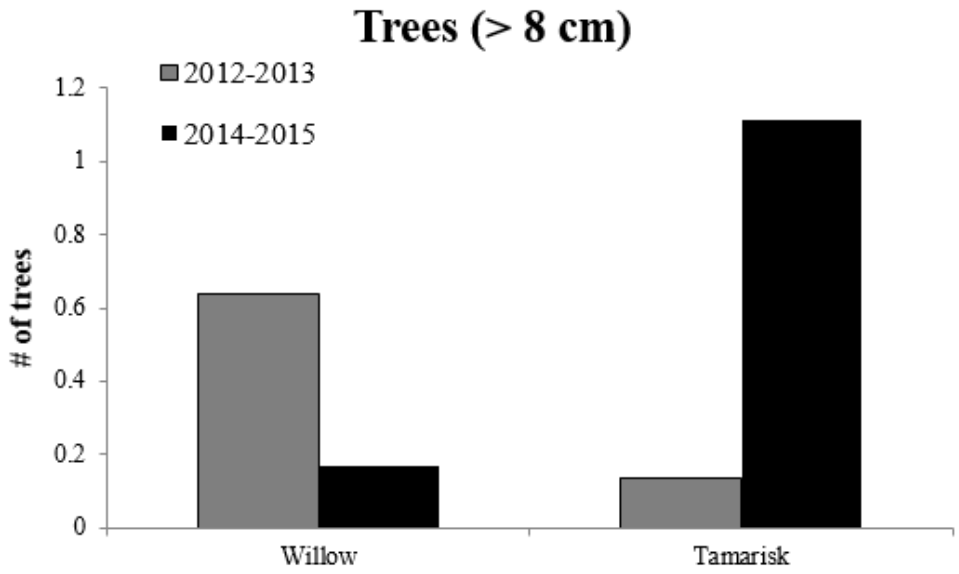
Mixed coyote willow-tamarisk

Tamarisk adds structural complexity to coyote willow-dominated habitat—increases concealment

Nest substrate and success







SWFL select nest sites (2012-2015):

- **High shrub and sapling density; low tree density**

- **Lower number of willow trees than number of tamarisk trees**

Habitat restoration and enhancement

-Tamarisk-dominated habitat (tamarisk trees = canopy) again becoming suitable for SWFL

-Tamarisk shrubs valuable when mixed with native vegetation

-Reduce tamarisk density by 50-60 %

-Prioritize tamarisk trees for removal

-Replant thinned areas with mix of native species that provide understory structure

-e.g. Coyote willow, cottonwood, seep-willow

-Prioritize areas with appropriate hydrology

Riverside Marsh Restoration Area

Riverside Marsh Restoration Area

January 28, 2014 **February 3, 2014**

Seegmiller Photo Point #3

Seegmiller Photo Point #3

April 23, 2014

June 23, 2014




River Rd Bridge
January 2016

January 11, 2016

April 20, 2016

River Rd Bridge
2016

River Rd Bridge
2016

August 4, 2016

November 3, 2016




Priorities for future work

- -SWFL habitat restoration
  - -Mitigation / ACE / BSA - Eagle Scout / FCA
    - -River Rd Bridge
    - -Above Johnson Diversion (JD 6)
    - -Riverside East
    - -Riverside Marsh
    - -Y-Drain
- -Continue SWFL monitoring
  - -Population size, nest success, & habitat use
  - -Distribution
  - -Cowbird control
    - - continued management in 2017
  - -Identify nest predators
    - -video monitoring

Partners

Lower Virgin River Fuels & Fire Council
Northern Arizona University
US Bureau of Reclamation
US Fish & Wildlife Service
Utah Division of Forestry, Fire & State Lands
Utah's Watershed Restoration Initiative
Virgin River Program
Washington County Habitat Conservation Plan
Washington County Water Conservancy District