

Saltcedar Wildlife Habitat on the Lower Colorado River:

Misconceptions and Implications of Biocontrol

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Misconceptions about Saltcedar

- Saltcedar is poor wildlife habitat.
- Food resources for wildlife are poor in saltcedar habitat.
- An increase in birds feeding on saltcedar biocontrol beetles is a net wildlife gain.
- Willow Flycatchers are the only riparian birds that use saltcedar.
- Willow Flycatchers do not do as well in saltcedar habitat as in native habitat.
- Removing saltcedar where a combination of saltcedar and native riparian habitat exists will benefit riparian birds.

Misconceptions about Saltcedar

- **Saltcedar is poor wildlife habitat.**
 - Native habitat is superior to saltcedar habitat, but where native habitat can no longer exist, saltcedar dominated woodlands are a better substitute for riparian obligate birds than native shrub or grassland vegetation.
 - Saltcedar is not suitable habitat for most woodpeckers and raptors that need large branches.
- **Food resources for wildlife are poorer in saltcedar habitat than in native habitat.**
 - Arthropod species composition is different between saltcedar and native habitat, species diversity is greater in native habitat, no difference in abundance of food resources between habitats. Sogge et al. 2005?, Durst et al. 2006

Misconceptions about Saltcedar

- An increase in birds feeding on saltcedar biocontrol beetles is a net wildlife gain.

Any increase will most likely be temporary. Once habitat is defoliated it will no longer provide the structure needed for many riparian obligate bird species.



Willow Flycatchers are the only riparian birds that use saltcedar.

- **Saltcedar dominated woodlands are important to southwestern riparian bird species where native habitat can no longer exist**
- **Saltcedar control and restoration projects that do not produce higher quality native riparian habitat are likely to result in a net loss for riparian obligate birds**
- **Post-control monitoring is needed to determine whether control and restoration goals have been achieved and bird populations have benefited.**

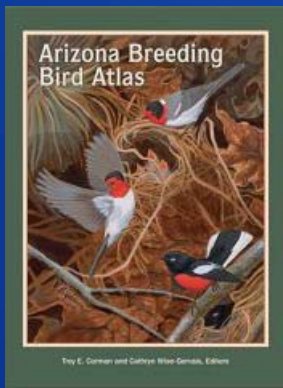
Studies Documenting Bird Use of Saltcedar

- Anderson et al. (1977)
- Howe (1986)
- Hunter et al. (1988)
- Brown et al. (1987)
- Livingston and Schemnitz (1996)
- Fleishman et al. (2003)
- Corman and Wise-Gervais (2005)
- Holmes et al. (2005)
- Sogge et al. (2005)
- Travis (2005)
- Hinojosa-Huerta (2006)
- Walker (2006)
- Sogge et al. (2008)

Which Birds Breed in Saltcedar Habitat?



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AZ Lowland and Mid-Elevation Riparian Birds

22 of 29 species (76%) breed in saltcedar habitats

Yellow-billed Cuckoo

Broad-billed Hummingbird

Black-chinned Hummingbird

Anna's Hummingbird

Belted Kingfisher

Northern Beardless Tyrannulet

Willow Flycatcher

Black Phoebe

Brown-crested Flycatchers

Thick-billed Kingbird

Bell's Vireo

N. Rough-winged Swallow

Cliff Swallow

Bewick's Wren

American Dipper

Lucy's Warbler

Yellow Warbler

Common Yellowthroat

Yellow-breasted Chat

Summer Tanager

Abert's Towhee

Song Sparrow

Blue Grosbeak

Lazuli Bunting

Indigo Bunting

Red-winged Blackbird

Brown-headed Cowbird

Hooded Oriole

Bullock's Oriole

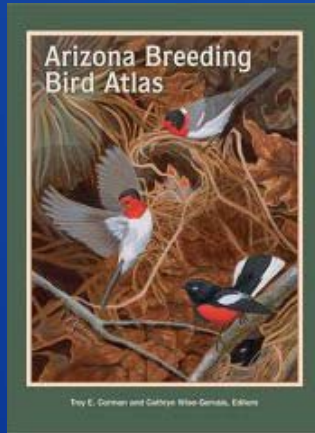
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Birds of North America

Species nesting in saltcedar

Blackbirds/Orioles/Tanagers:	9
Sparrows/Grosbeaks:	8
Warblers/Vireos:	6
Wading/Water Birds:	5
Flycatchers:	3
Game Birds:	3
Hummingbirds:	2
Others:	12
<hr/>	
TOTAL	32



22 Species



32 Species

49 Species total

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Misconceptions about Saltcedar

- **Willow Flycatchers do not do as well in saltcedar habitat as in native habitat.**
 - No Difference in:
 - Nest Success
 - Nest productivity
 - Nestling survival
 - Adult survival
 - Physiological condition
 - Prey abundance



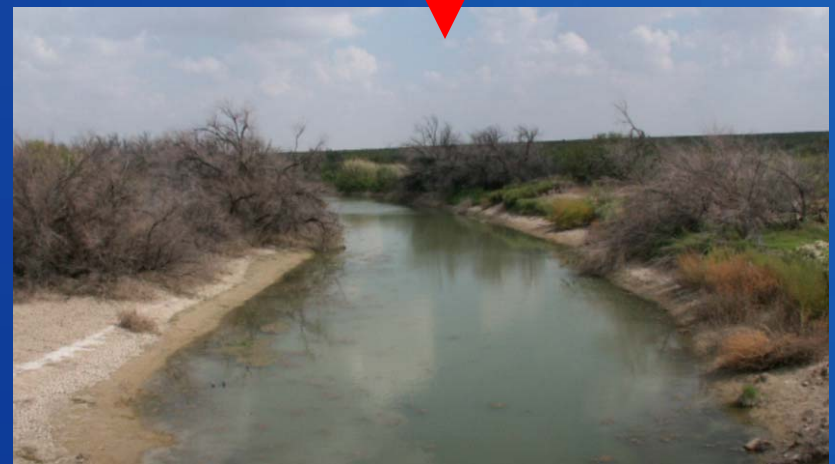
from Sogge et al. 2006

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Misconceptions about Saltcedar

- **Removing saltcedar where a combination of saltcedar and native riparian habitat exists will benefit riparian birds.**
 - On the lower Colorado River, mixed saltcedar and native riparian habitat was the most valuable for birds. Removing saltcedar may compromise the habitat, making it less suitable for riparian obligate birds. Van Riper et al. 2008
 - Removing saltcedar may not result in an increase in native tree species where hydrology has been altered.

Saltcedar control and restoration projects that do not produce higher quality native riparian woodland habitat are likely to result in a net loss for riparian obligate birds and other riparian dependent wildlife



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LCR MSCP Species that utilize Saltcedar

- **Southwestern Willow Flycatcher (breeding)**
- **Yellow Billed Cuckoo (breeding)**
- **Yellow Warbler (breeding)**
- **Bells Vireo (breeding)**
- **Summer Tanager (breeding)**
- **Sootywing skipper (butterfly) (nectaring)**
- **Western Red Bat, Western Yellow Bat, California Leaf-nosed bat, Townsends Big Eared Bat (Foraging)**

**Implications of Saltcedar beetles on
Southwestern Willow Flycatcher
breeding habitat
along the LCR**

Biocontrol

- Initial Releases of *Diohrabda* spp. began during summer of 1999 at 10 caged sites
- Releases outside of cages began in May of 2001 at initial 10 caged sites based on being greater than 200 miles from known SWFL breeding sites
- Releases expanded in 2005 to additional 7 states north of 38 Degrees latitude based on assumed poor survival below this latitude
- First release in known Southwestern Willow Flycatcher breeding habitat occurred at St. George Utah in 2006 at 37 degrees latitude
- Beetle populations in St. George exploded in 2008
- Beetles spread from St. George to Littlefield, AZ which is near 36 degrees latitude
- Beetles also located at Meadow Valley Wash 49 miles from Muddy River Confluence.

Diohrabda Elongata Life History

- Collected at Fukang, China (42.6 ° N latitude) and Chilik, Kazakhstan (43.6 ° N)
- Specific to Tamarisk spp. except for Athel species
- Other ecotypes that are being tried for release are Crete (35 ° N), Tunisia (34 ° N), and Uzbekistan (38-43 ° N)
- Adult and young defoliate leaves by eating and sucking liquid out of leaves, and scrape outer layer of bark from stems
- Emergence from diapause in spring usually occurs late May to Early June
- Mating and egg-lay continues through summer to produce 2-5 generations/year
- Larvae occur in 3 instars
- Adults go into diapause in late Sept. to early Oct. and overwinter in leaf litter.



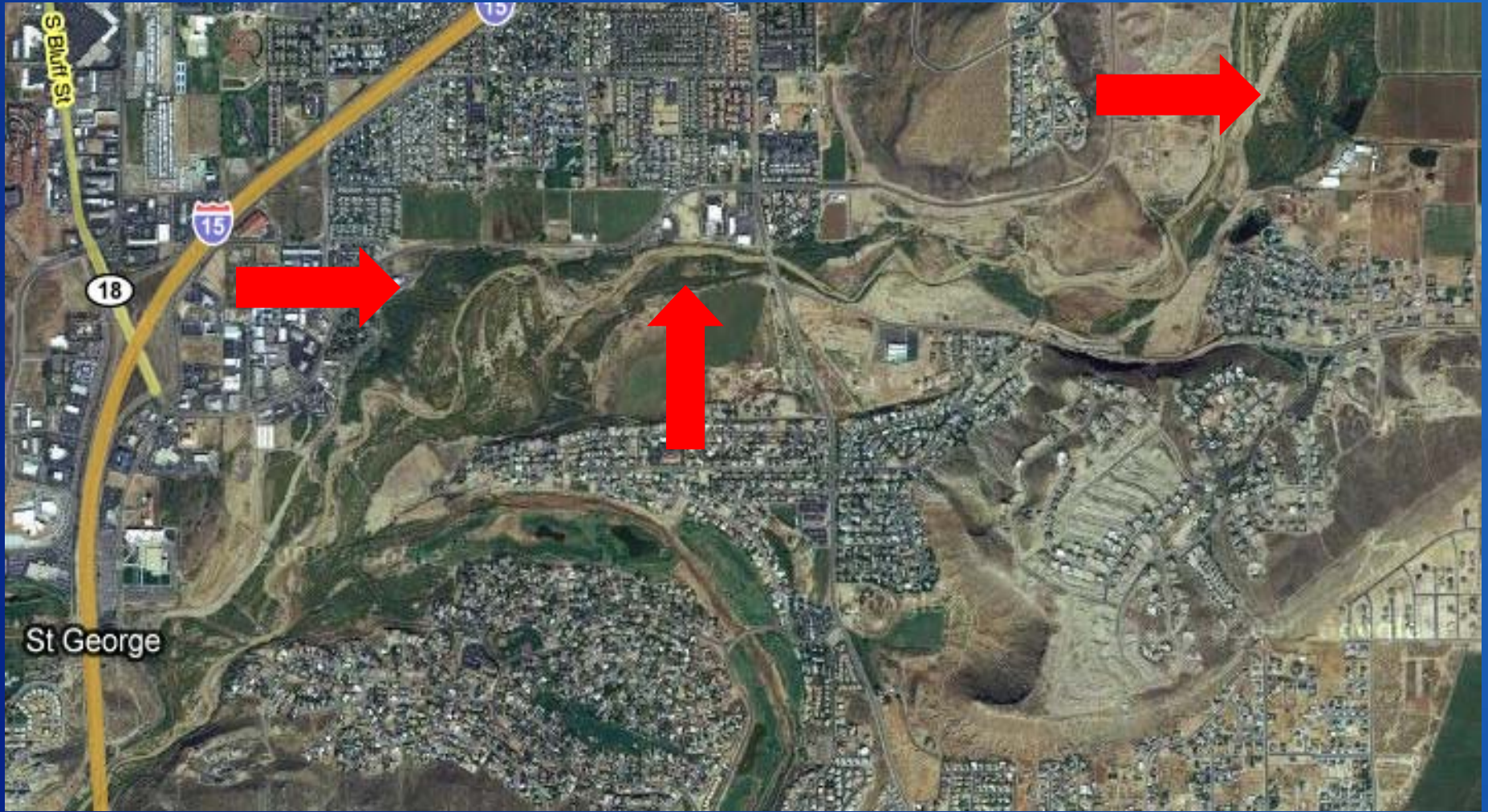
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2008 UDWR SW Willow Flycatcher Nest Monitoring Virgin River, Washington County, Utah

Seegmiller

- 10 territories
- 5 confirmed breeding pairs, 2 possible pairs, 3 lone males
- 6 nests located (one re-nest)
- 13 fledge successfully/17 known eggs
- 1 disappears as egg or day old fledgling
- **3 chicks slow to develop, disappear before fledging (late start-possible re-nest)**

River Road Bridge

- 2 territories
- 1 confirmed pair
- 1 lone male/migrant
- 2 SWWIFL eggs, 1 BHCO egg in one nest
- 1 SWWIFL egg hatches, fledges, other eggs fail to hatch

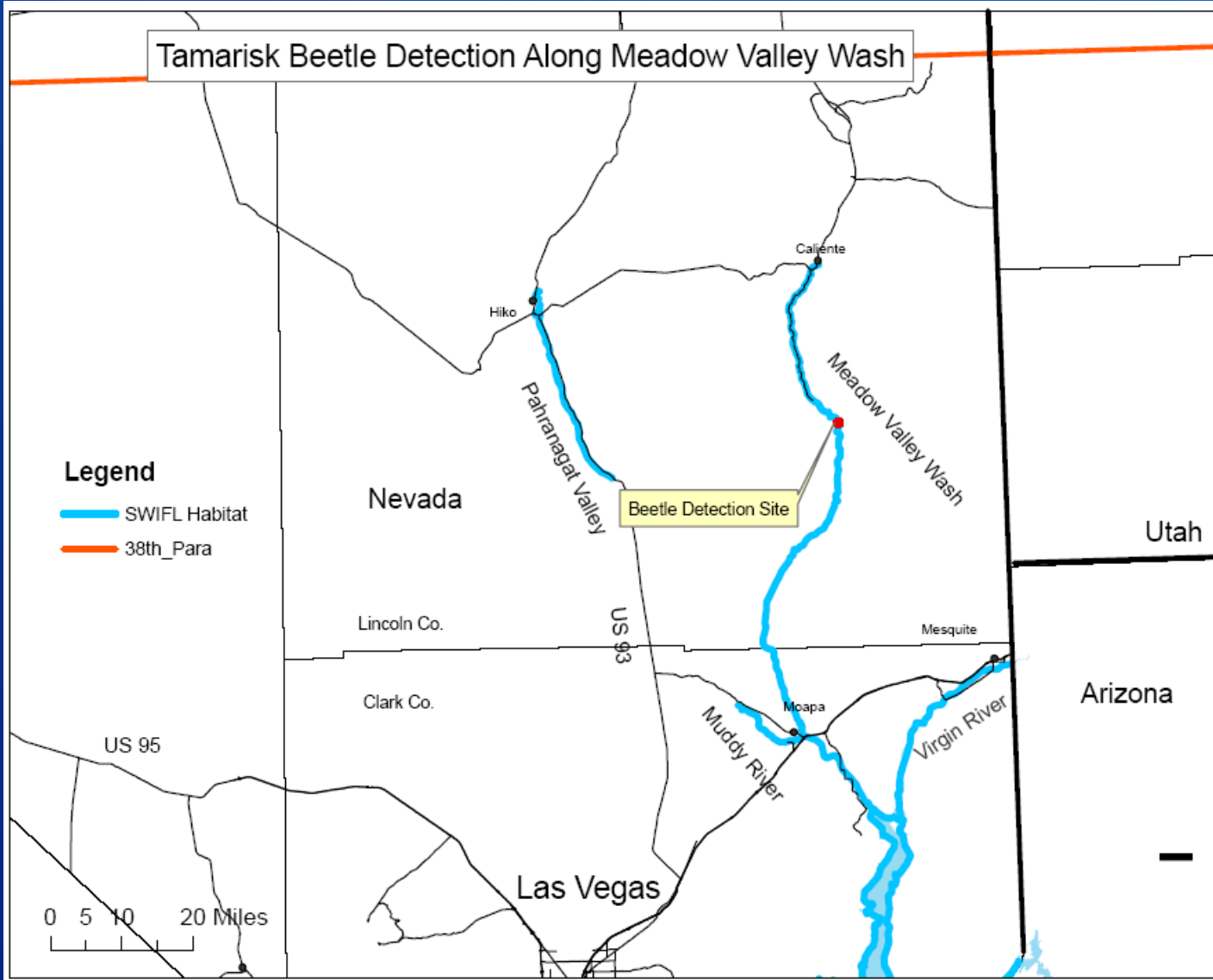
Duck Pond

- 4 territories
- 2 confirmed pairs, 1 additional possible pair, 1 lone male
- 2 nests (one re-nest)
- 3 successful fledgings/ 9 eggs, one BHCO egg
- 1 nest fails at egg stage (predation or storm event-eggs disappear)
- **1 nest (re-nest) abandoned at egg stage (parasitized by BHCO, possibly over-exposed due to defoliation of tamarisk by beetles)**

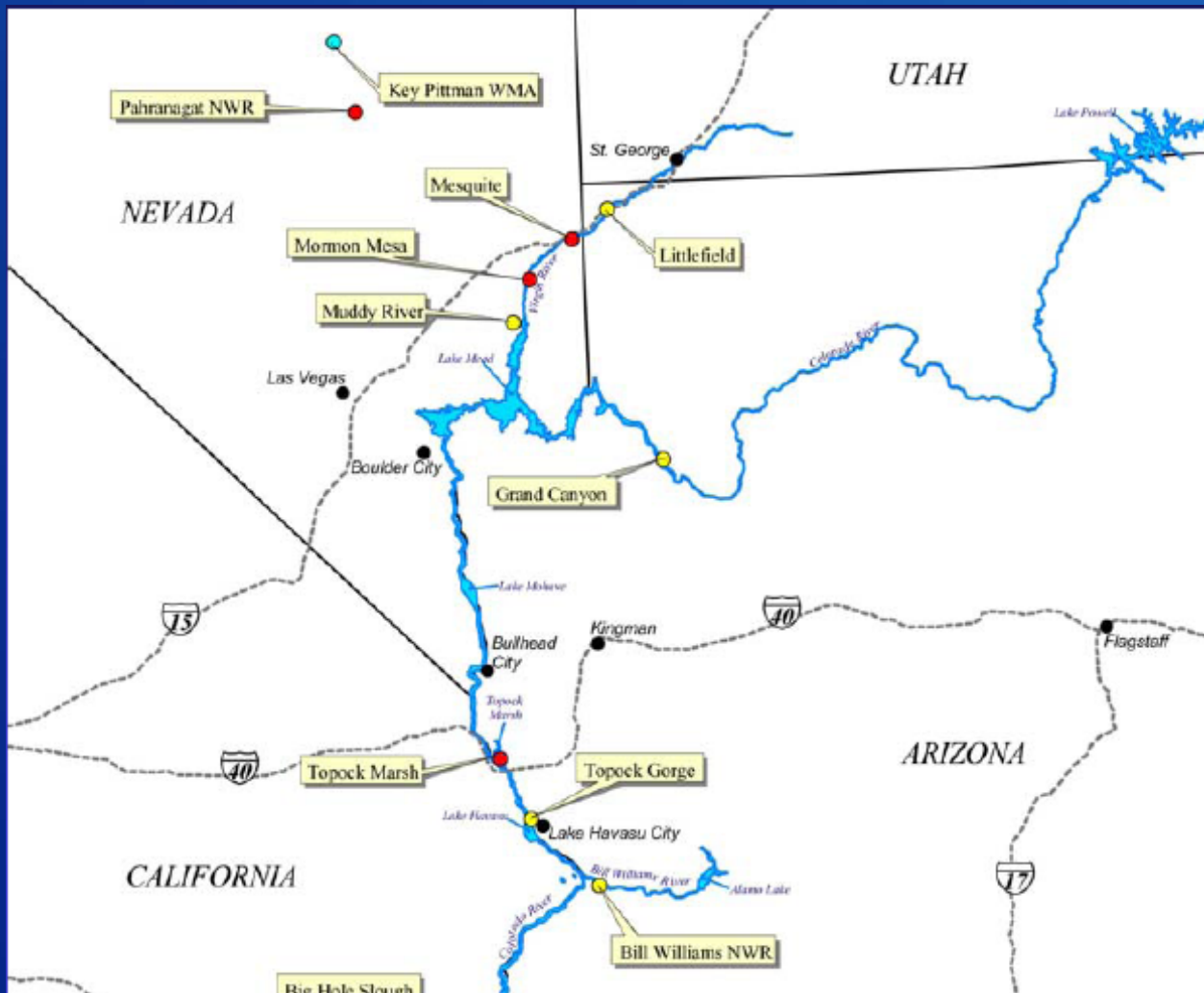




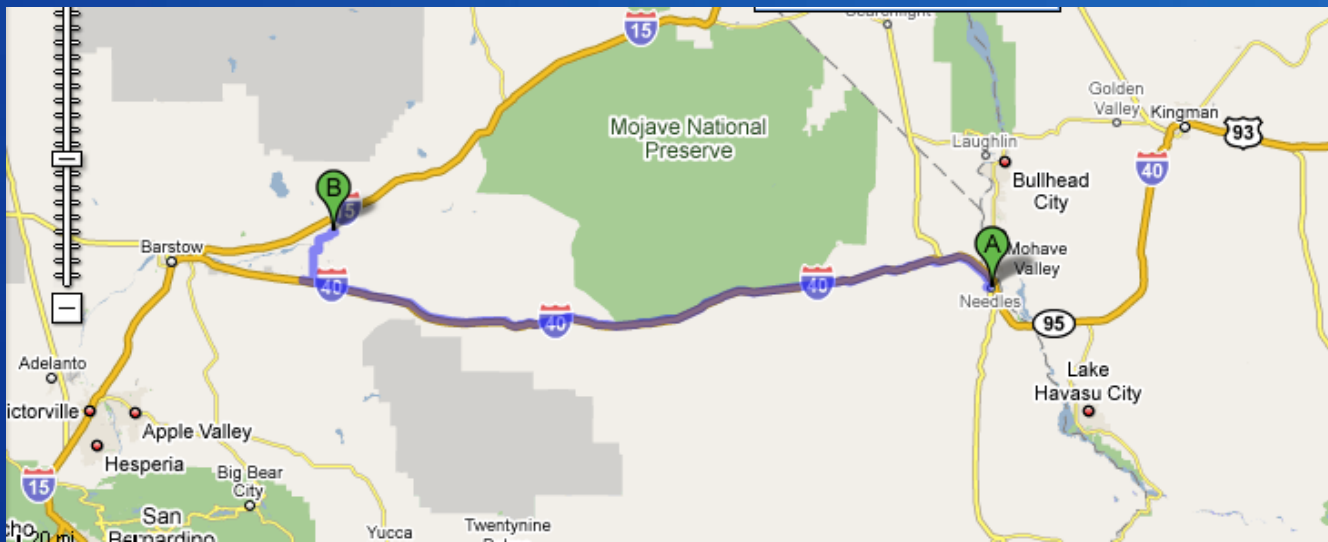
Tamarisk Beetle Detection Along Meadow Valley Wash



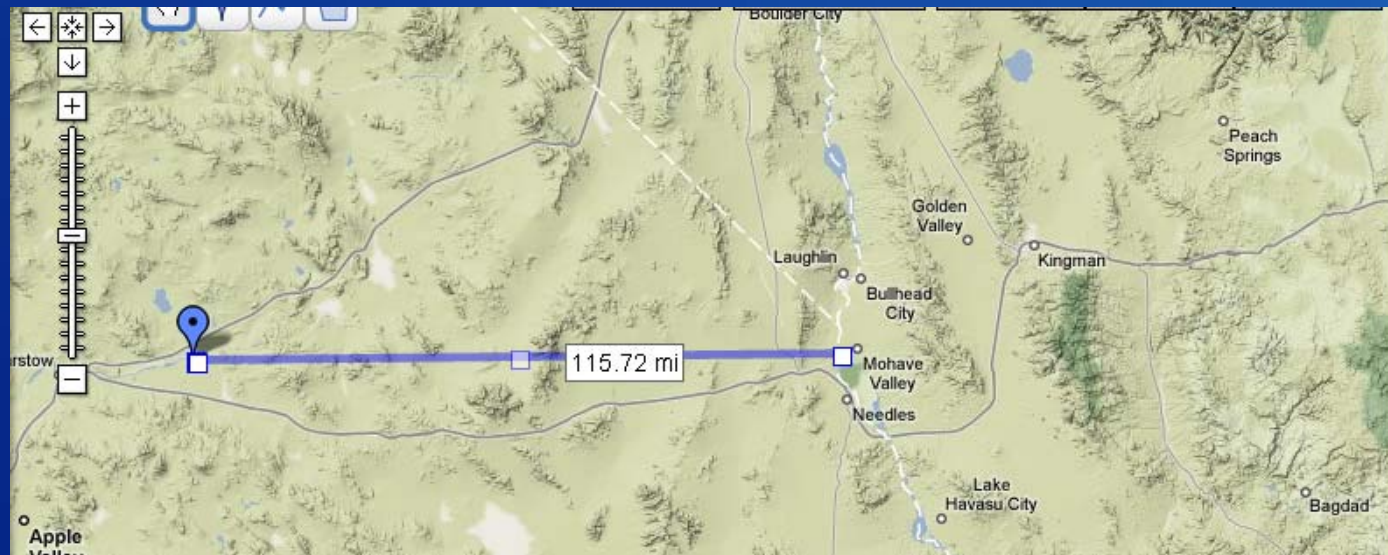
Map of known SWFL Breeding locations along the LCR



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Approximately 130 miles from Camp Cady to Needles, CA via roads.



Approximately 115 miles to river over land.

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Within the Virgin River from Utah State border to the delta with Lake Mead approximately 7200 acres of saltcedar exists. This area of the Virgin River includes several major breeding populations of SWFL that would be impacted by the movement of the beetle downstream, these SWFL breeding populations may act as source populations for habitat creation sites created by the LCR MSCP

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Percent Saltcedar at 5 Main Breeding SWFL Sites Along Virgin River and LCR

- Pahranaगत NWR 2.1%
- Mesquite 32.7%
- Muddy River 46.7 %
- Mormon Mesa 77.2%
- Topock Marsh 91.6%

*SWCA unpublished data

Saltcedar Acreage on the LCR

LCR REACH	Acres
1	22,604
2	804
3	18,231
4	34,138
5	6,570
6	7,714
7	3,237
Virgin River	7,142
TOTAL	100,440

MSCP restoration is \$623 million in 2003 dollars adjusted for inflation the number will be more toward 1.5 billion over the 50 year project for 8100 acres (Cottonwood, Willow, Mesquite habitat)

If we replace all saltcedar with riparian habitat it would be over 15 billion dollar. This does not include clearing saltcedar, leveling the land, or putting in irrigation system, because currently only creating habitat on agricultural lands.

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Water

- Bureau of Reclamation does not have a water right along the LCR. Therefore all water for restoration must be bought from current allocation.
- Currently just to get the trees established we are utilizing approximately 6 to 12 af/acre of water for at least the first 5 years.
- To re establish natives 902,184 af of water would be needed. This is approximately 3 times Nevada's water allocations. This doesn't include the amount to actually create flycatcher habitat, as at a minimum moist soil or standing water is needed.

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Take Home messages

- Beetles are coming! Move as far as 10-20 miles downriver in a year
- Already reproducing below the 38th parallel and are adapting to longer photoperiod
- Defoliation occurs during height of SWFL breeding season
- Several years (over 7) before saltcedar are killed
- LCR MSCP very important to implement before beetles arrive
- LCR MSCP Habitat maintenance program – fund was created to maintain existing habitat along the LCR. If most of that habitat is defoliated, much more funds will be needed to maintain this habitat.







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