Northern Tamarisk Beetle (*Diorhabda carinulata*) Effects on Established Tamarisk Feeding Invertebrate Populations along the Las Vegas Wash, Clark County, Nevada

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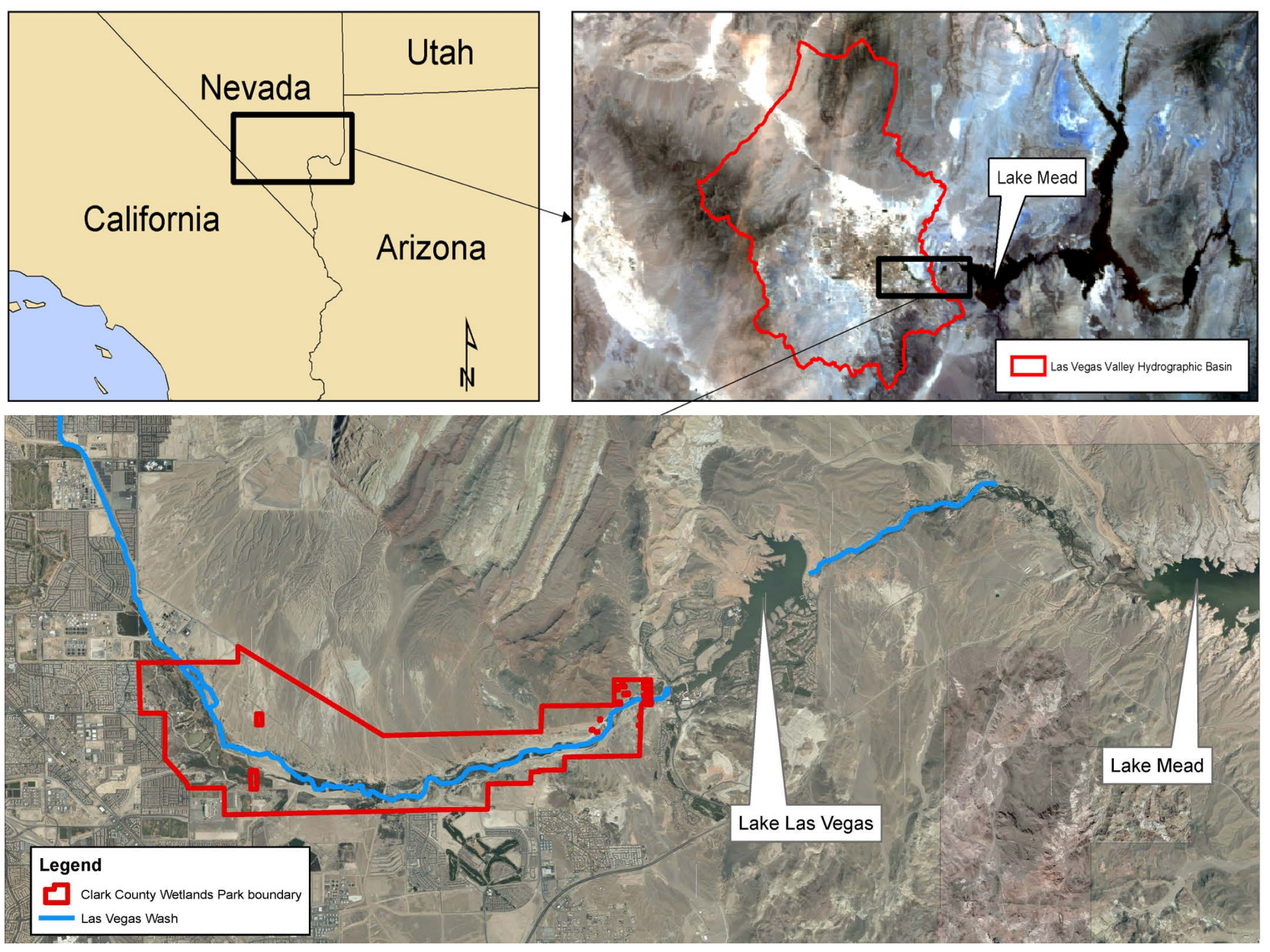
Las Vegas Wash Coordination Committee

Working to stabilize and enhance the valuable environmental resources of the Las


Utah
Nevada
California
Arizona
N
Lake Mead
Las Vegas Valley Hydrographic Basin
Lake Las Vegas
Lake Mead
Legend
Clark County Wetlands Park boundary
Las Vegas Wash

Las Vegas Wash

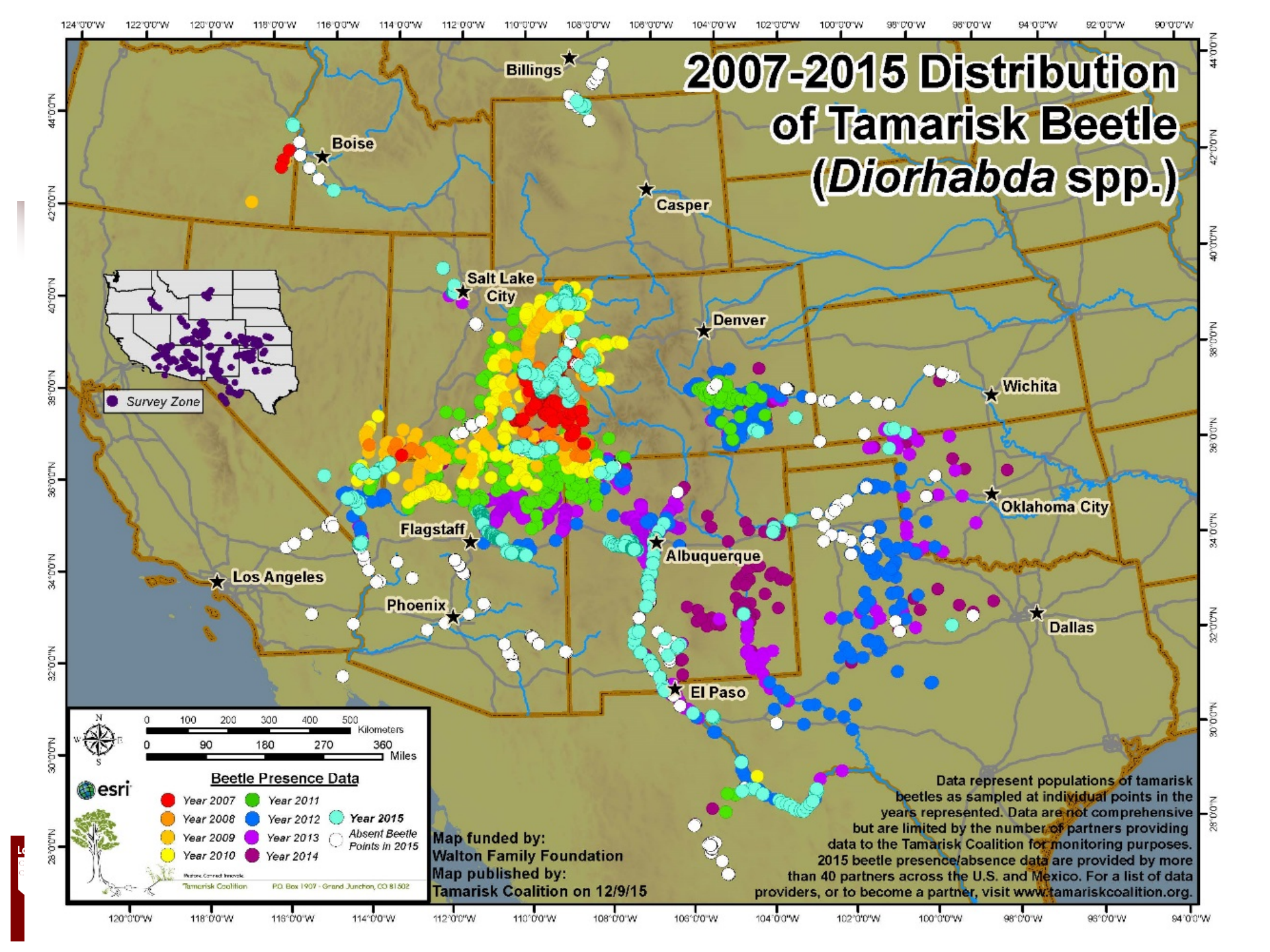
- Primary drainage channel for ~1600 sq. mile Las Vegas Valley watershed:
  - Discharges urban flows (primarily treated wastewater) and storm run-off to Lake Mead
  - Once ephemeral; perennial since the1950s
  - Increasing flows created wetlands, but then incised the channel and eroded them away
  - Prior to restoration activities beginning in 1999, had over 1500 acres of salt cedar
    - Now less than 70

Invertebrate Studies along Las Vegas Wash

- SNWA
  - Annual benthic macroinvertebrates 2000-2013
- Wiesenborn 2005
  - First survey of invertebrates on tamarisk at Wash
- Nelson 2009 & 2014
  - 2009 - Compared restored areas to non-native
  - 2014 – Monitored riparian upland butterflies
- Eckberg and Foster 2011
  - Bat foraging study
- Anderson & Nelson, 2013
  - Insect visitation on tamarisk
- Annual inventory report – 2010 & 2011

Biocontrol

- Tamarisk leaf beetles studied to ensure no harm to non-targets 1992-2001
- Released near St. George in 2006
  - By County agency without USDA approval
- Concern that defoliation impacting native species habitat


2007-2015 Distribution of Tamarisk Beetle (Diorhabda spp.)
Billings
Boise
Casper
Salt Lake City
Denver
Wichita
Oklahoma City
Flagstaff
Albuquerque
Los Angeles
Phoenix
Dallas
El Paso
Survey Zone
Beetle Presence Data
Year 2007
Year 2008
Year 2009
Year 2010
Year 2011
Year 2012
Year 2013
Year 2014
Year 2015
Absent Beetle Points in 2015
Kilometers
Miles
Map funded by:
Walton Family Foundation
Map published by:
Tamarisk Coalition on 12/9/15
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. 2015 beetle presence/absence data are 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.
Tamarisk Coalition
P.O. Box 1907 - Grand Junction, CO 81502

Known Tamarisk Feeders at Las Vegas Wash

- Armored scale (*Chionaspis* sp.)
- Tamarisk leafhopper (*Opsius stactogalus*)
  - Wiesenborn 2005
- Splendid tamarisk weevil (*Coniatus splendidulus*)
  - Eckberg and Foster 2011
- Tamarisk leaf beetle (*Diorhabda carinulata*)
  - This study

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Armored Scale (*Chionaspis* sp.)

Copyright © 2009 Jon Hart (from www.bugguide.net)

Tamarisk Leafhopper (*Opsius stactogalus*)

Copyright © 2007 Claude Pilon (from www.bugguide.net)

Splendid Tamarisk Weevil (*Coniatus splendidulus*)

Copyright © 2011 Tom Meyers

Beetle (*Diorhabda carinulata*)

Northern Tamarisk Beetle (*Diorhabda carinulata*)

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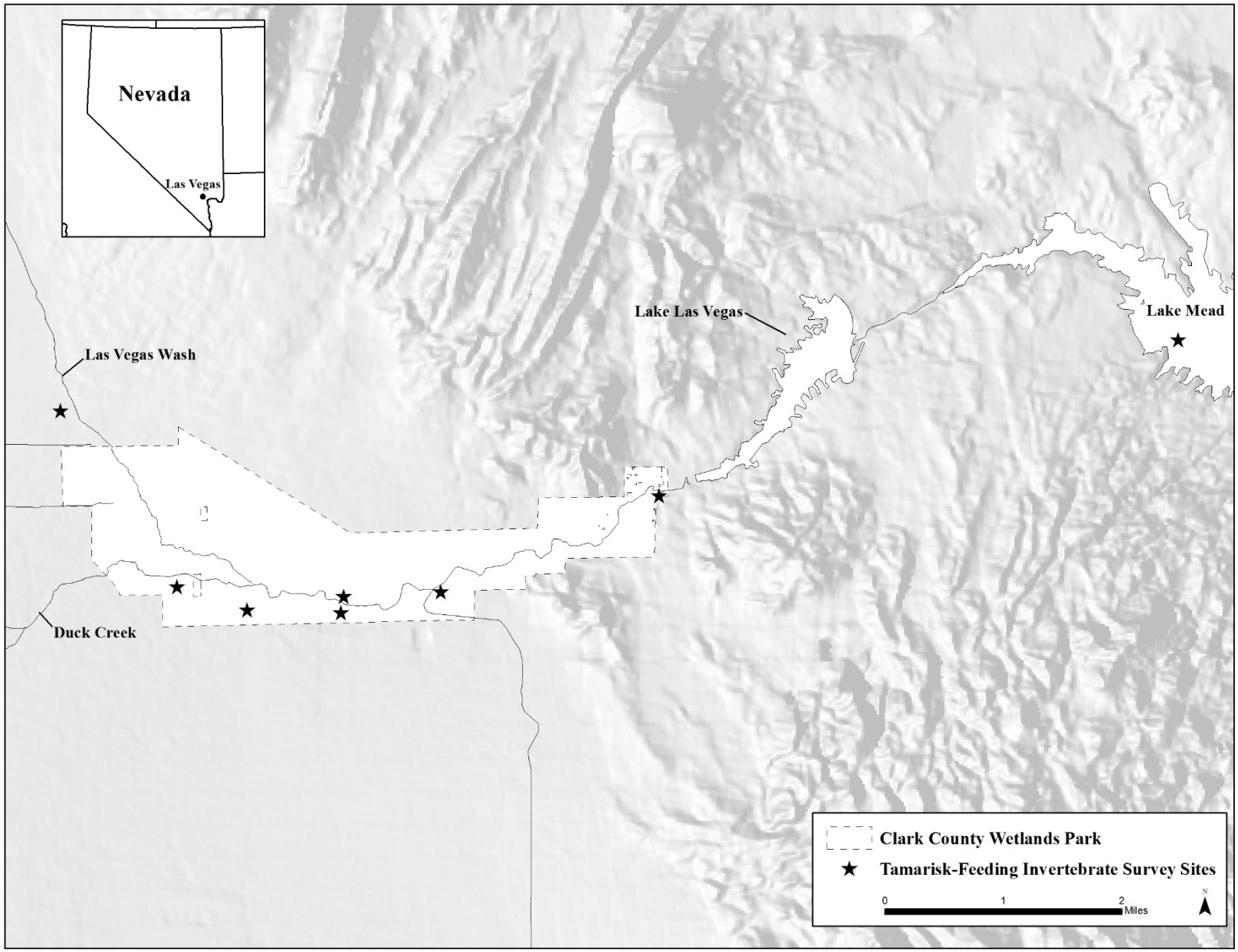
Research Questions

- What is the current distribution of known tamarisk feeders along the Wash?
- Is their population increasing or decreasing?
- What impact will the arrival of the tamarisk leaf beetle have on existing species?

Methods

- Eight locations along the Wash including Las Vegas Bay at Lake Mead
- Follow current Tamarisk Coalition procedures for sampling
  - 25 sweeps per location – 5 sweeps spaced 5 m apart with 38 cm sweep net
- Sampled throughout tamarisk growing season (May – September)

Sampling Locations



Sampling Locations – Las Vegas Bay

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Sampling Locations – Bostick Weir

Sampling Locations – Pabco Road Weir

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Results – start counting!

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Results – start counting!

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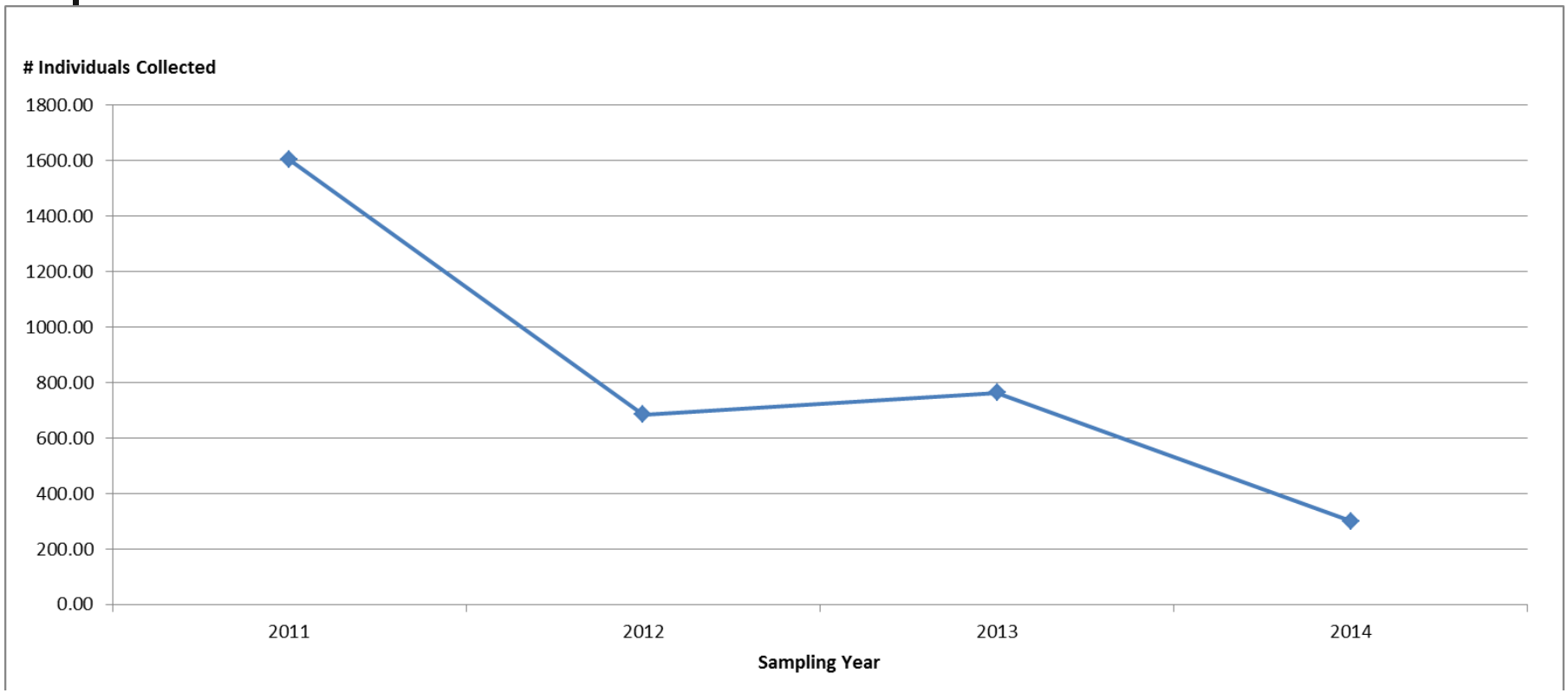
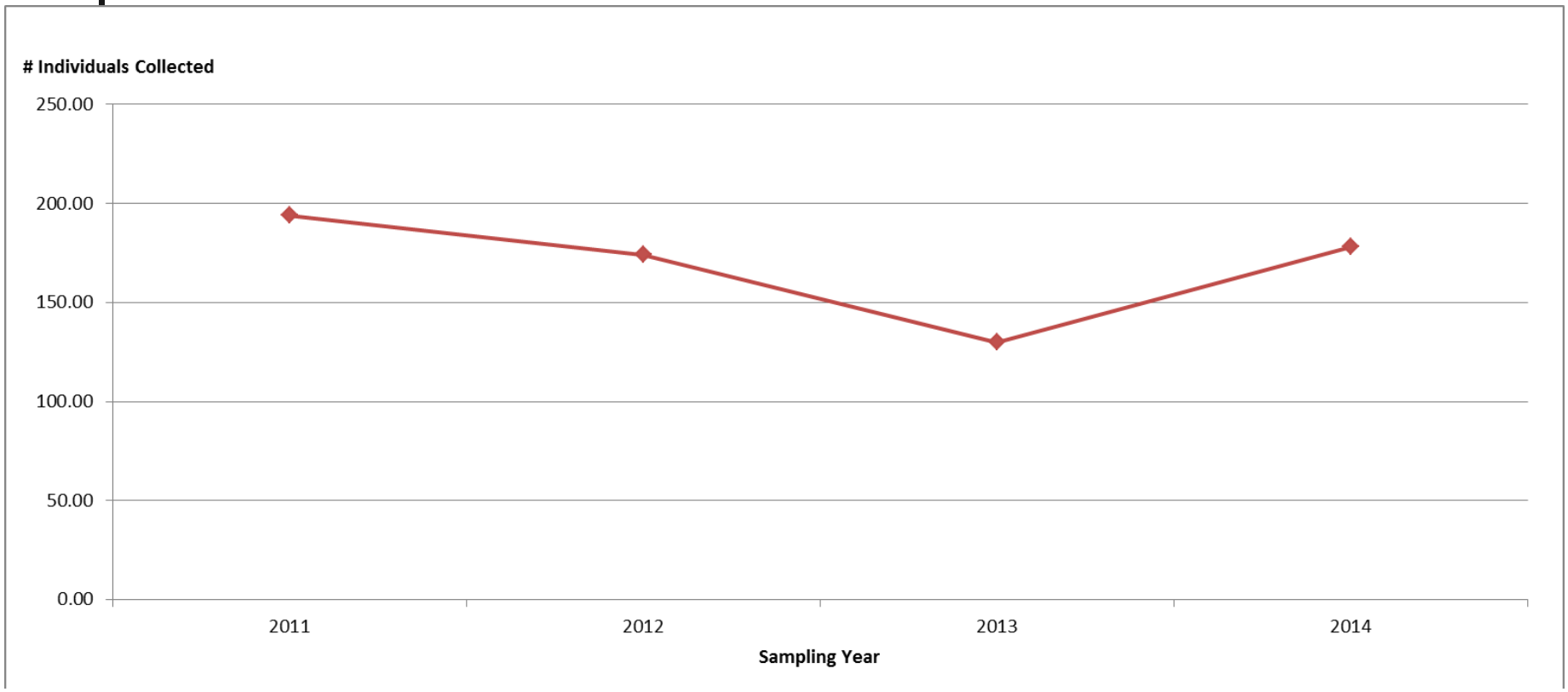
Results

- Northern tamarisk beetle
  - First detected June 2012
- Tamarisk leafhopper and splendid tamarisk weevil found in all sampling locations in all years
- Defoliation
  - Less than 10% at any point in 2011

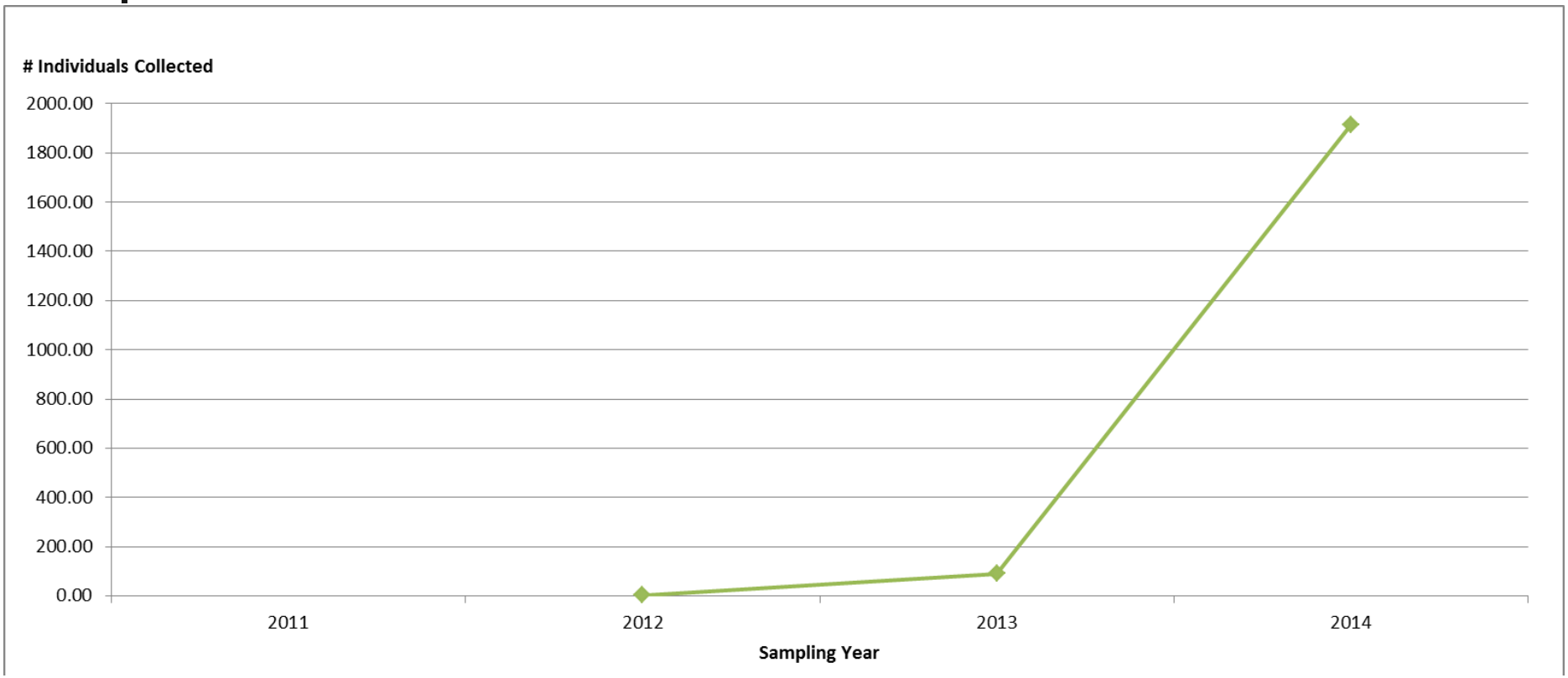
Tamarisk Leafhopper 2011-2014



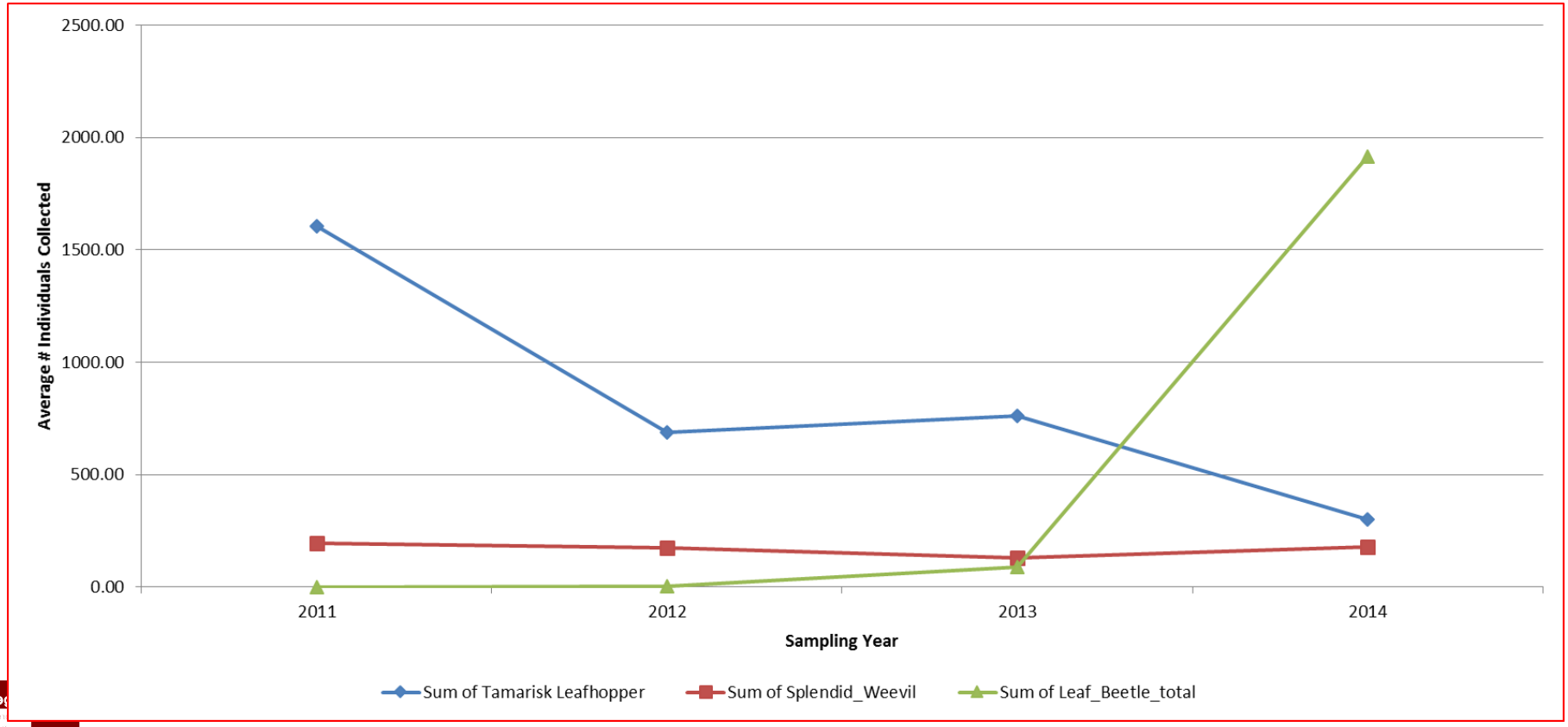
Splendid Tamarisk Weevil 2011-2014



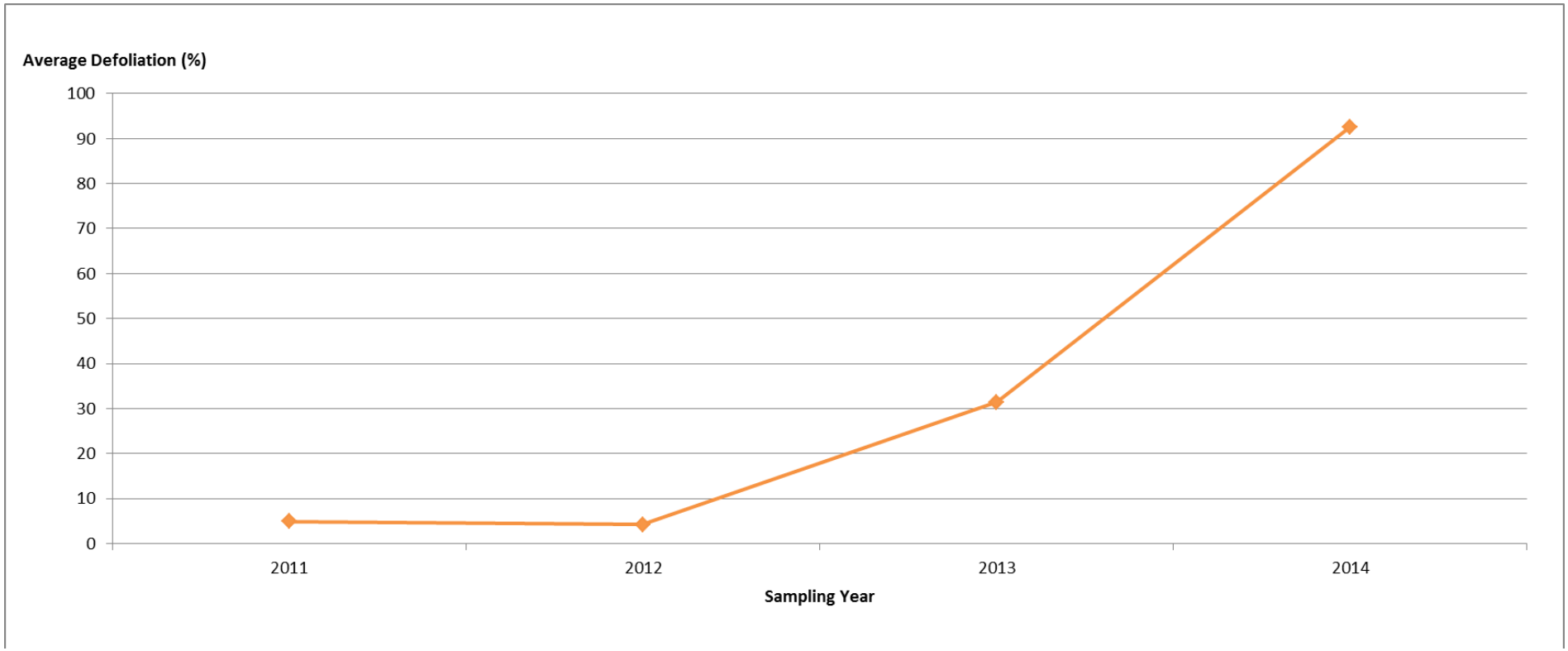
Northern Tamarisk Beetle 2011-2014



Average Sample Abundance All Species - 2011-2014



Average Defoliation 2011-2014



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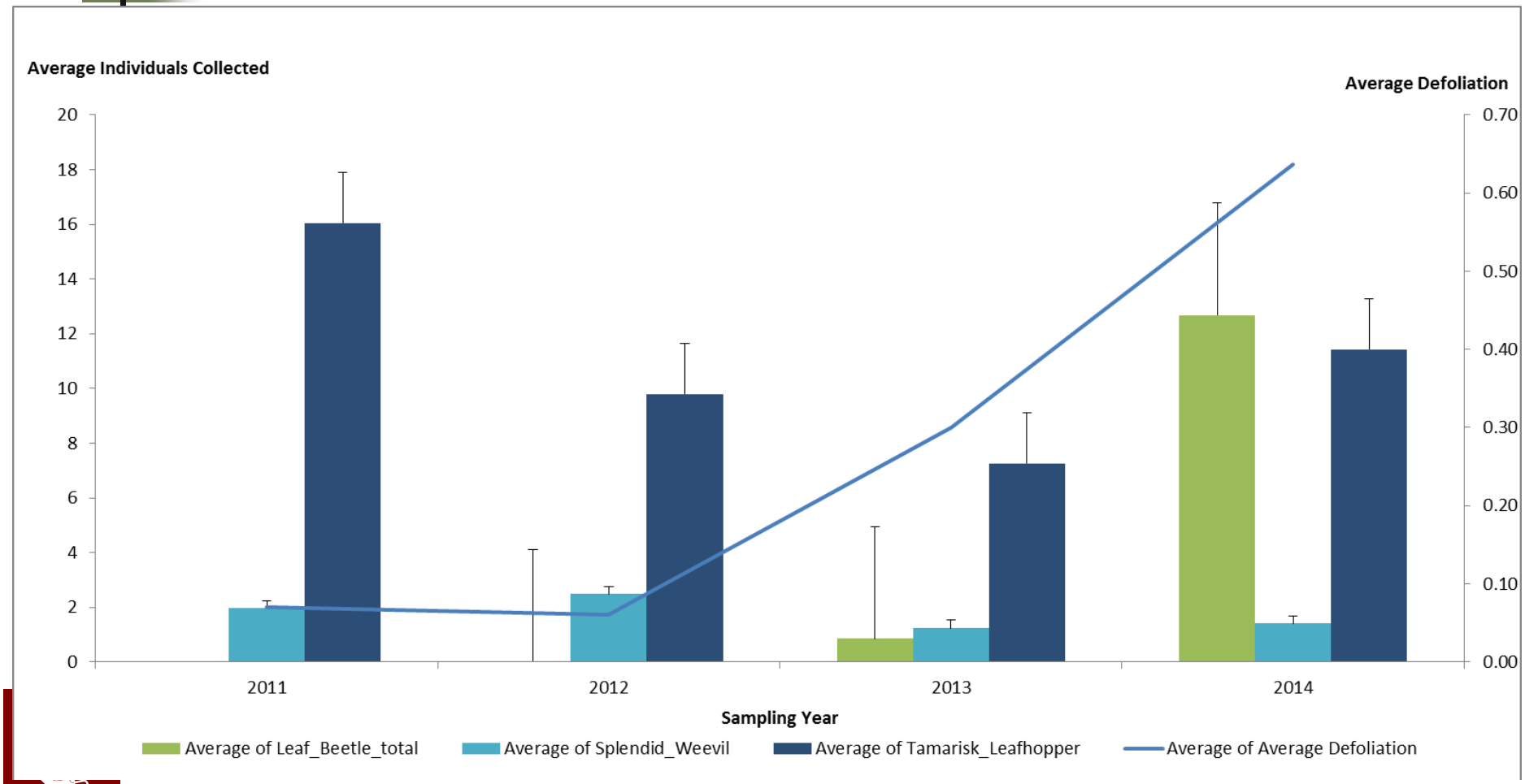
Average Sample Abundance All Species - 2011-2014



20-30% Defoliated Tamarisk

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60-70% Defoliated Tamarisk

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90-100% Defoliat Tamarisk

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Pabco South - July 2012

Pabco South - June 2014

Conclusions

- All three species have similar emergence times
  - High numbers in early summer (May-June) and decreasing throughout the summer into fall
- Impact of Northern tamarisk beetle on tamarisk immediate
  - Second year defoliation substantially higher
- Northern tamarisk beetle displaced tamarisk leafhopper
  - Little impact on splendid tamarisk weevil
- Potential increased pollination of native species
  - Nelson, 2014

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Upcoming…

- Manuscript accepted and in final review with Southwestern Naturalist
- Research opportunities
  - Identify impact of other feeders after *Diorhabda* leaves.
  - Impact on fire regime
- No further studies along the Wash

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Pabco South - 2015

Questions?