Amphibian Monitoring

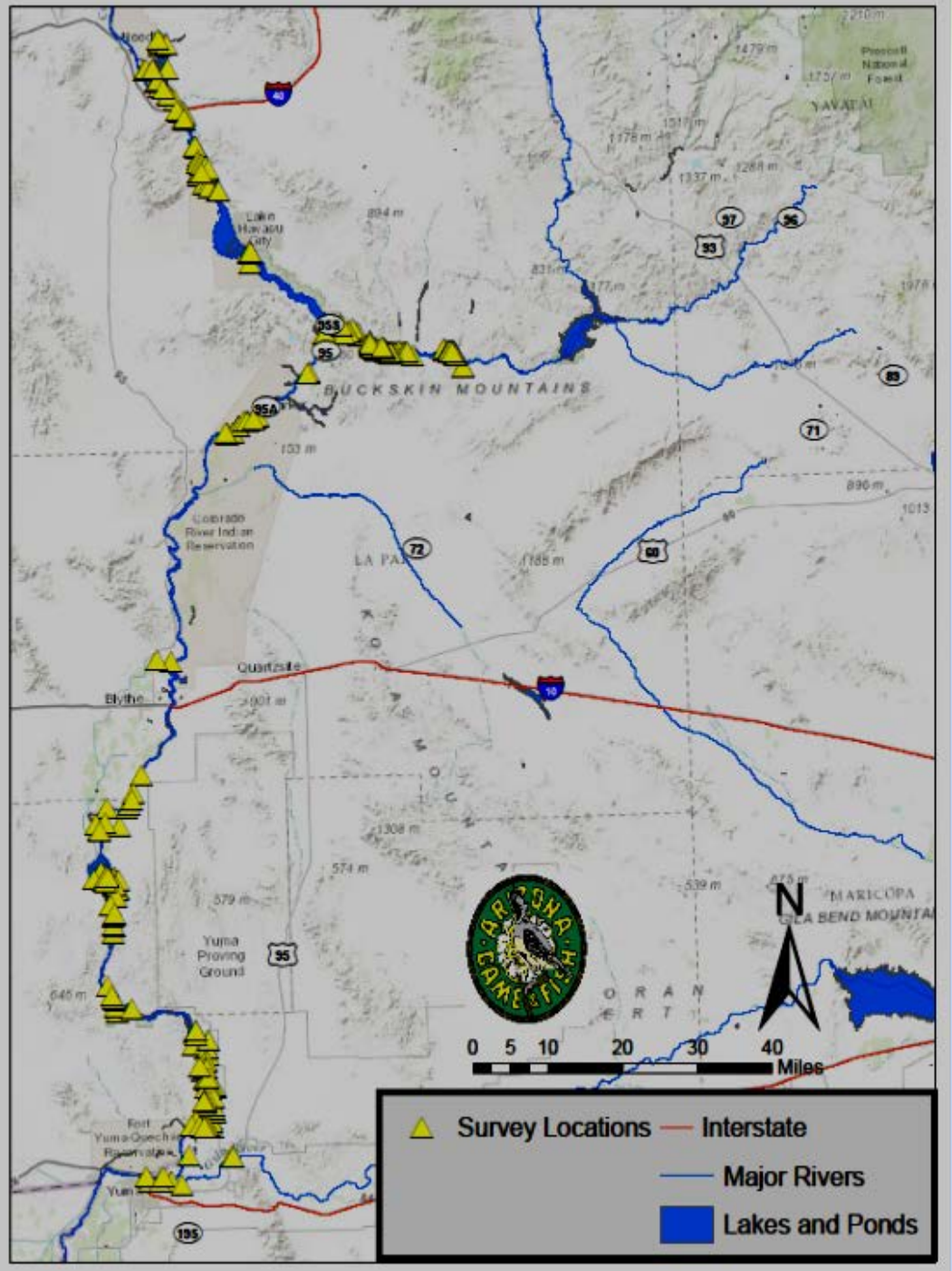
Lowland Leopard Frog
(Lithobates yavapaiensis)

Colorado River Toad
(Incilius alvarius)

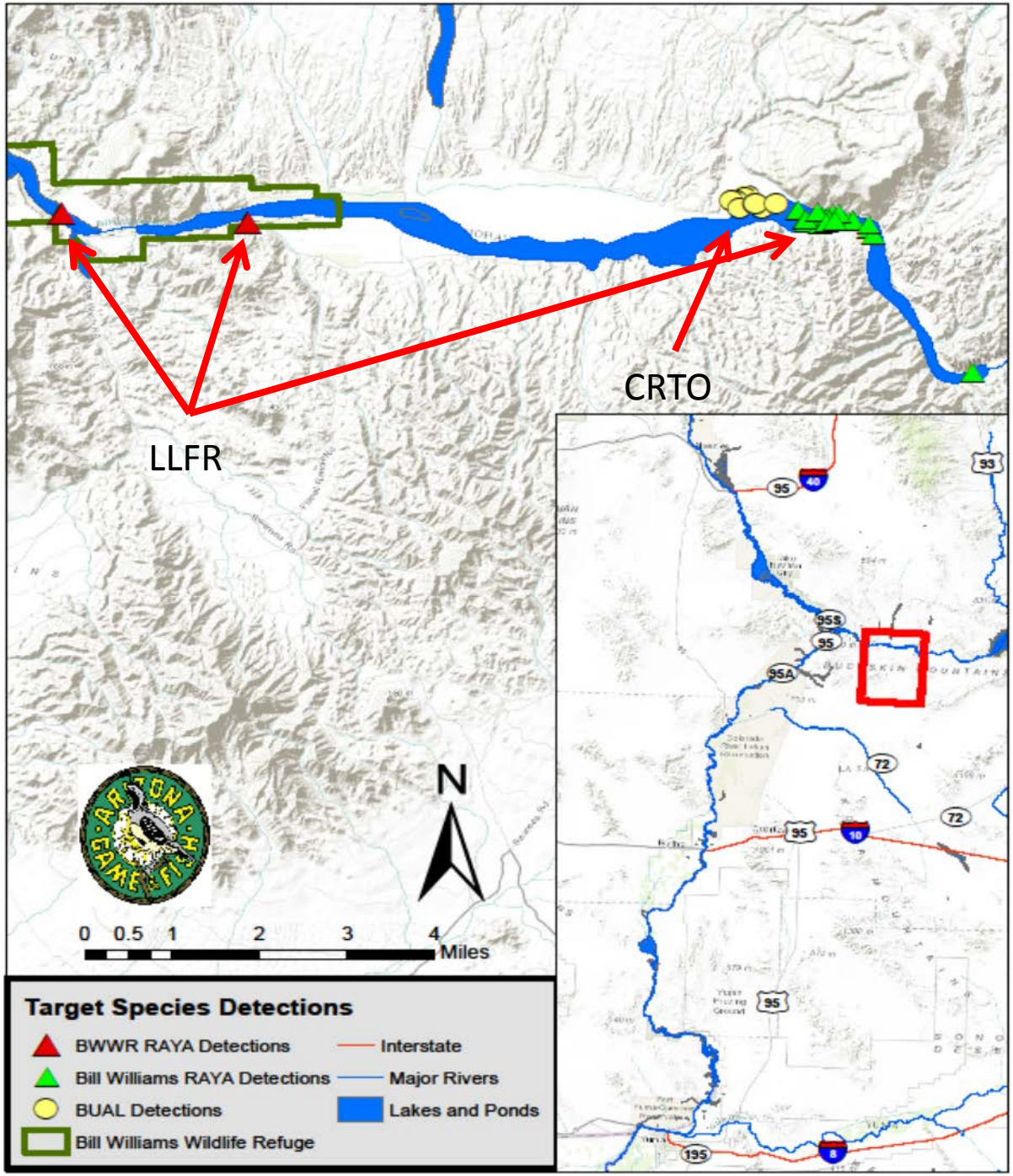
on the Bill Williams River

2011-2013 Amphibian Study

Surveyed the Lower Colorado River and the Bill Williams River National Wildlife Refuge for presence of CRTO and LLFR

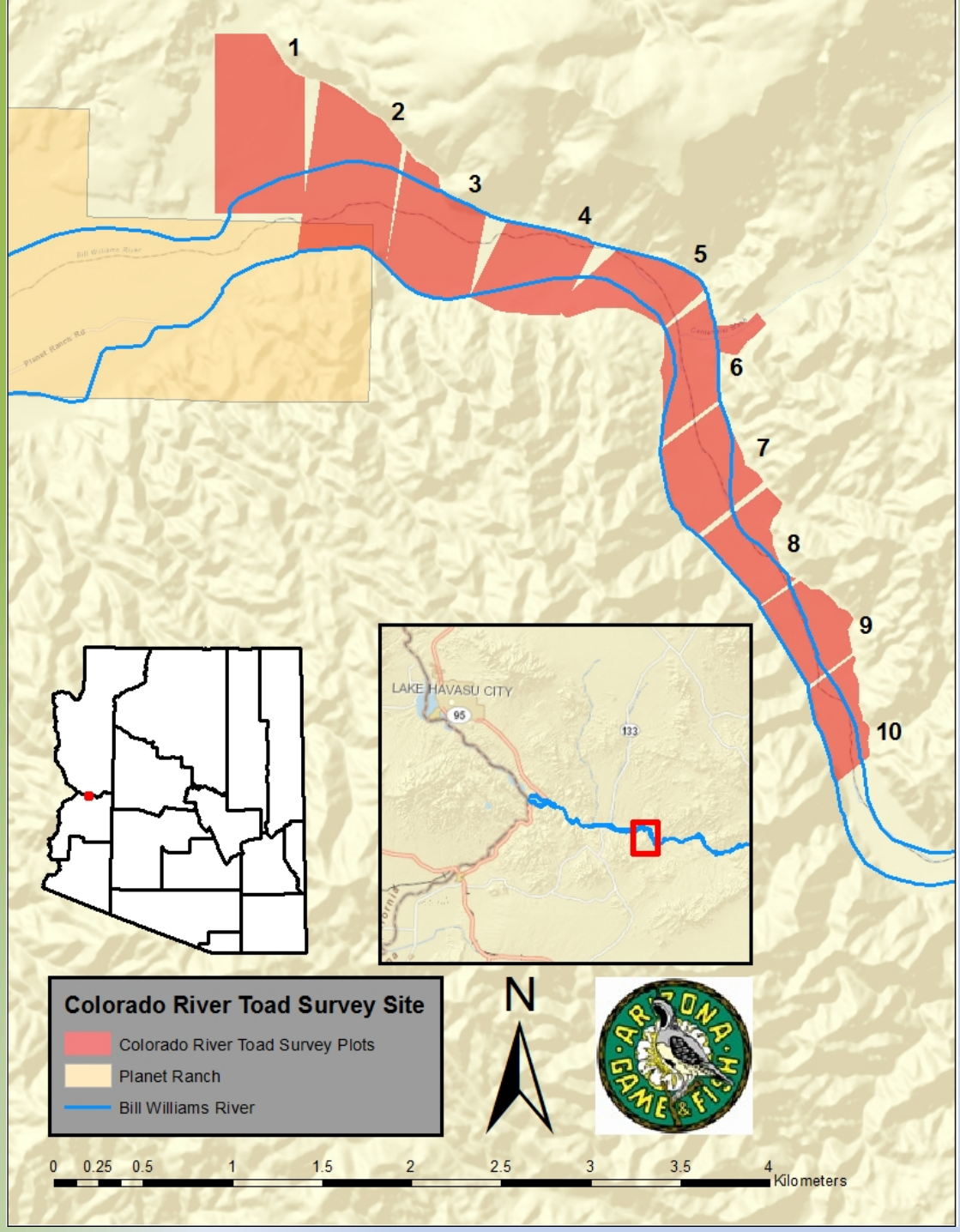


Locations of Captures



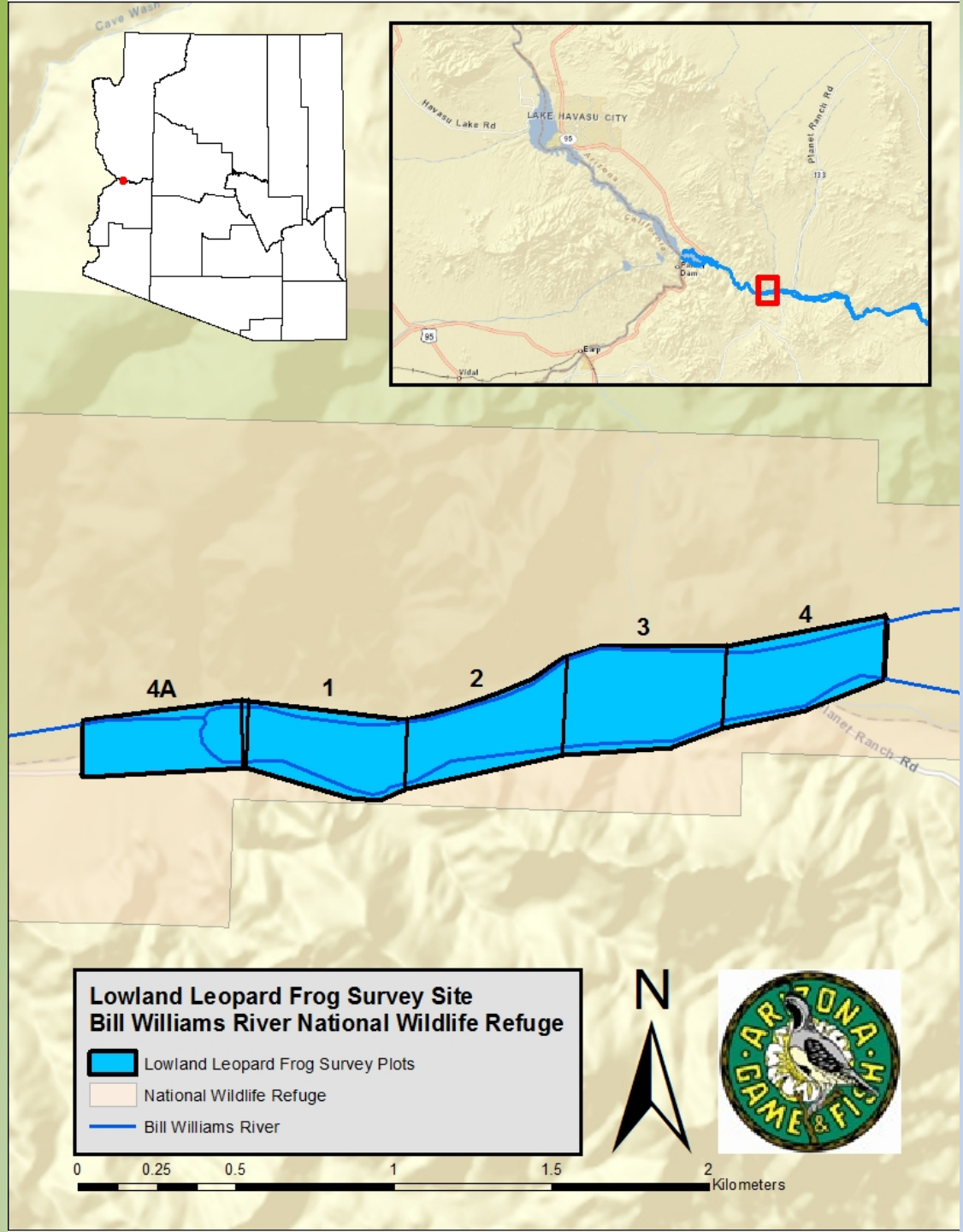
2014-2015

- 2 Survey seasons
  - Summer monsoon (July-September)
  - Spring (February-May)
- Study Locations
  - Bill Williams River (BWR)


1
2
3
4
5
6
7
8
9
10
LAKE HAVASU CITY
95
133
Colorado River Toad Survey Site
Colorado River Toad Survey Plots
Planet Ranch
Bill Williams River
N
0 0.25 0.5 1 1.5 2 2.5 3 3.5 4
Kilometers

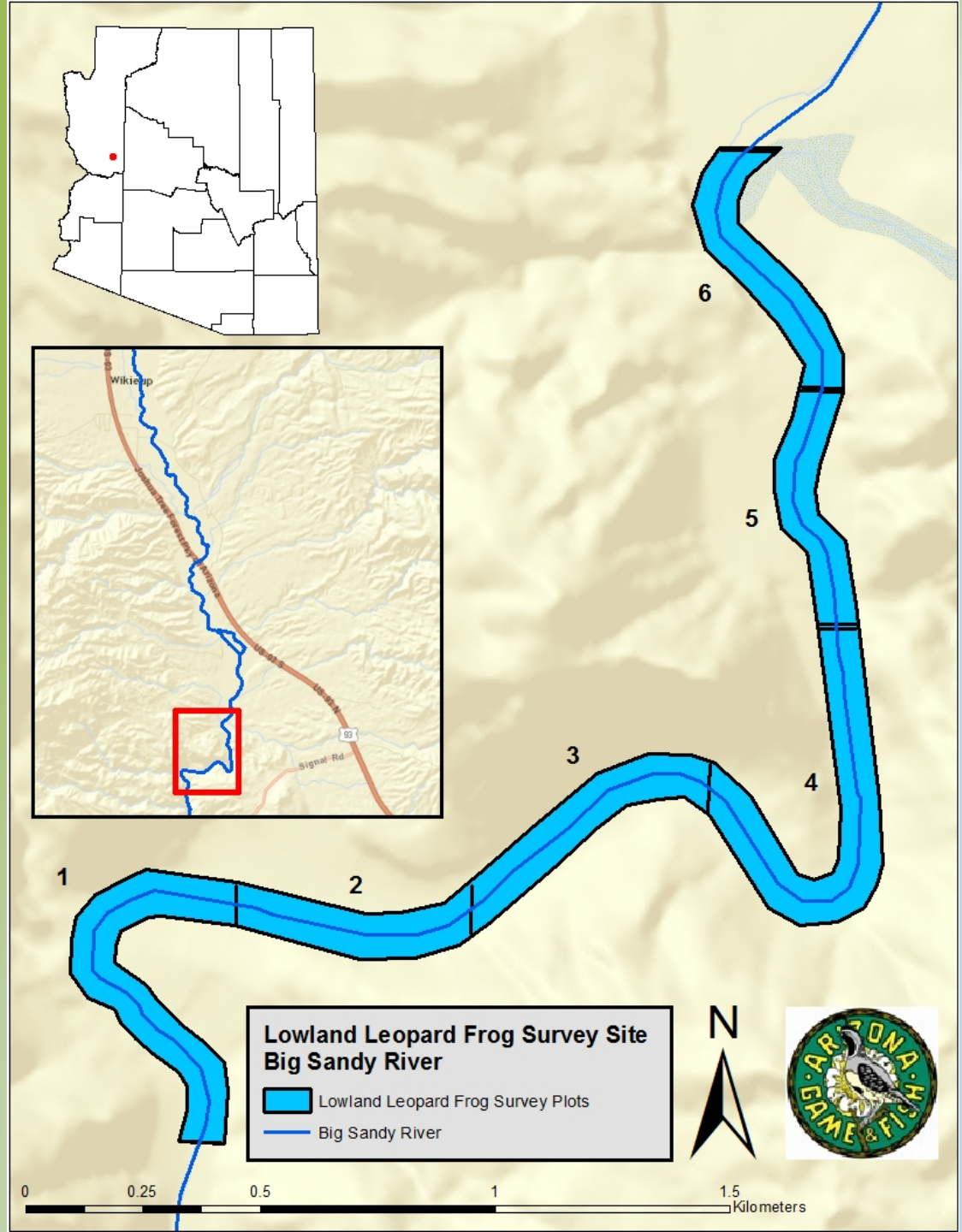
2014-2015

- 2 Survey seasons
  - Summer monsoon (July-September)
  - Spring (February-May)
- Study Locations
  - Bill Williams River (BWR)
  - BWR National Wildlife Refuge (BWRNWR)


Cave Wash
Havasu Lake Rd
LAKE HAVASU CITY
95
Planet Ranch Rd
133
Arizona
California
Dam
Parker
Vidal
4A
1
2
3
4
Planet Ranch Rd
Lowland Leopard Frog Survey Site
Bill Williams River National Wildlife Refuge
Lowland Leopard Frog Survey Plots
National Wildlife Refuge
Bill Williams River
N
0
0.25
0.5
1
1.5
2
Kilometers

2014-2015

- 2 Survey seasons
  - Summer monsoon (July-September)
  - Spring (February-May)
- Study Locations
  - Bill Williams River (BWR)
  - BWR National Wildlife Refuge (BWRNWR)
  - Big Sandy River (BSR)


Wikieup
Signal Rd
93
1
2
3
4
5
6
Lowland Leopard Frog Survey Site
Big Sandy River
Lowland Leopard Frog Survey Plots
Big Sandy River
N
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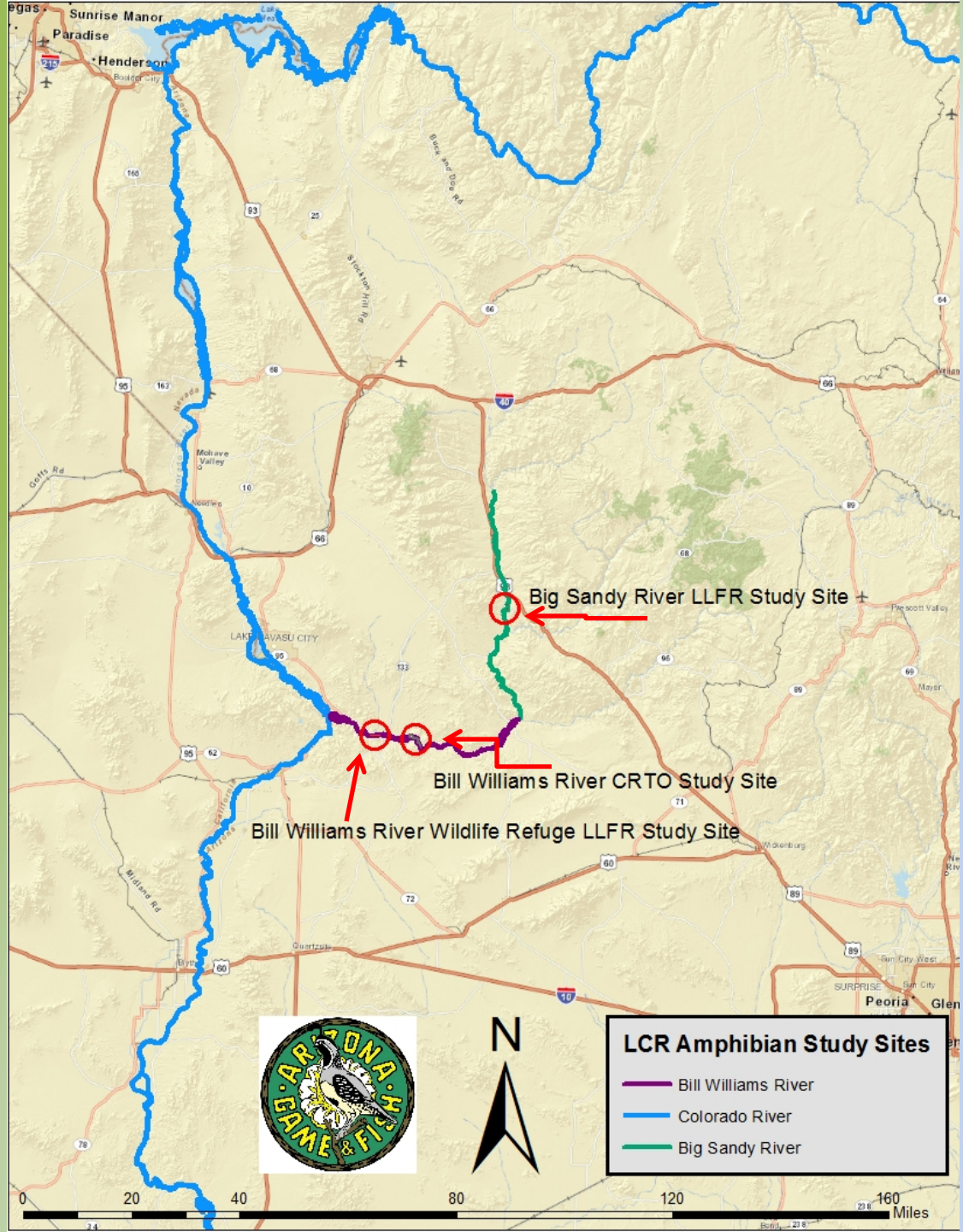
0.25
0.5
1
1.5
Kilometers


Big Sandy River LLFR Study Site
Bill Williams River CRTO Study Site
Bill Williams River Wildlife Refuge LLFR Study Site
LCR Amphibian Study Sites
Bill Williams River
Colorado River
Big Sandy River
N
0
20
40
80
120
160
Miles
Sunrise Manor
Paradise
Henderson
Peoria

Methods

– Visual Encounter Surveys (VES)

Methods

- Visual Encounter Surveys (VES)
  - VES Call/Response (VES C/R)
- Funnel Traps Arrays (FTA)

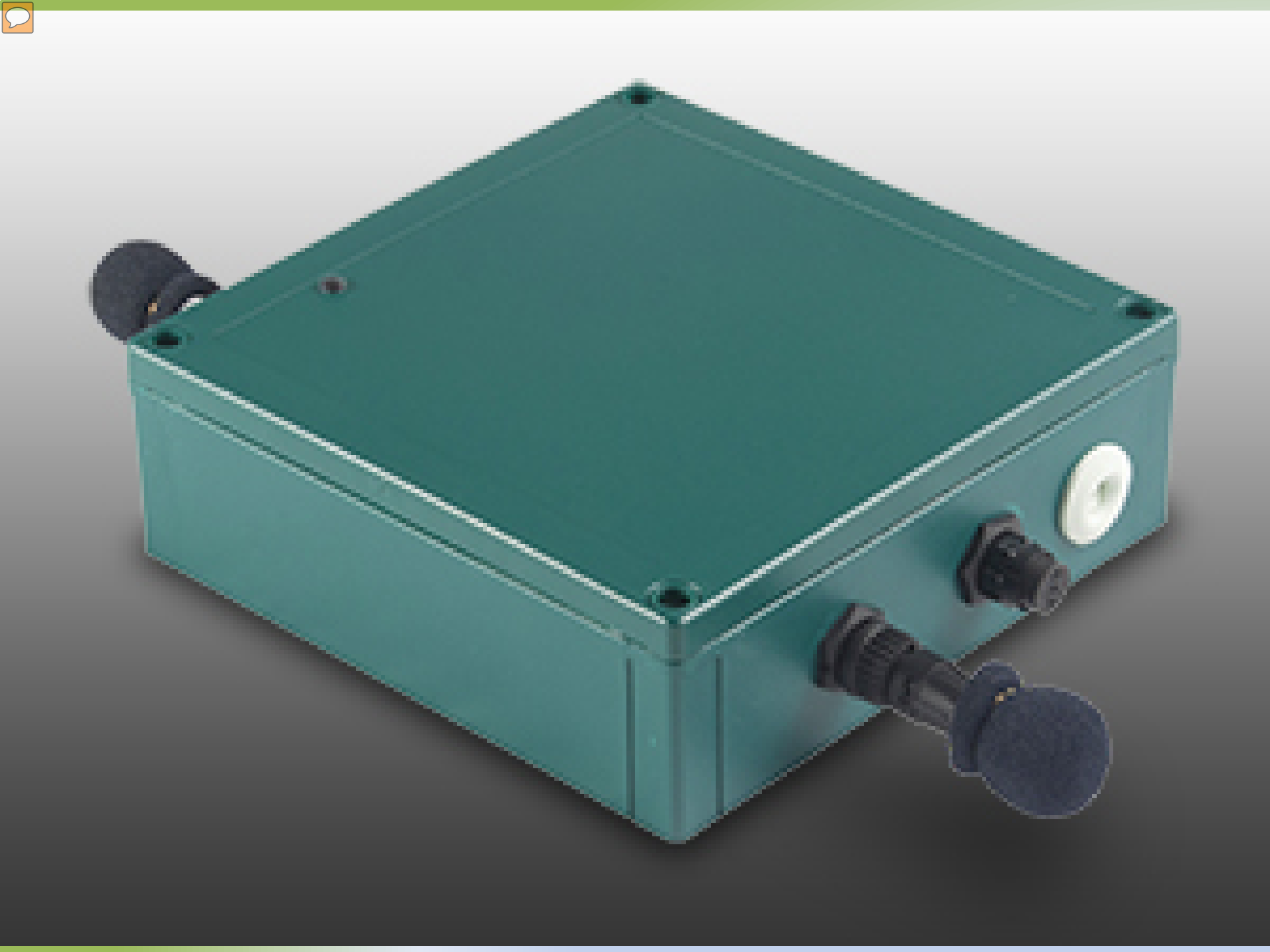
44 Pounds
Of Traps!

Methods

- Visual Encounter Surveys (VES)
  - VES Call/Response (VES C/R)
- Funnel Traps Arrays (FTA)
- Environmental DNA (eDNA)

Methods

- Visual Encounter Surveys (VES)
  - VES Call/Response (VES C/R)
- Funnel Traps Arrays (FTA)
- Environmental DNA (eDNA)
- Digital Automated Recorders (DAR)



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Lowland Leopard Frog Captures

	BWRNWR	Big Sandy	Total	Recaptures
Survey type				
Minnow Traps	56	176	232	33
VES	70	141	211	32
VES (call responses)	28	124	152	-
DAR	293	375	668	-
eDNA	Pending	Pending	Pending	

What are we doing with this data

Lithobates yavapaiensis 2015		
Method	**P**	**Cost Corrected Detection Probability**
VES	**0.77**	**0.75**
VES CR	**0.92**	**0.89**
Traps	**0.79**	**0.61**
DAR	**0.32**	**0.74**

What's next

- The second LLFR season starts in 1 week
- 1 season of testing for each species starting during the 2016 CRTO season
- Final judgement on our chosen method

Acknowledgements

- AZ Game and Fish personnel-E. Grabowsky, E. Lees, S. Arnett-Ramero, S. Williams, D. Leavitt, T. Cotton, A. Grimsley, K. Sullivan, C. Beach, H. Hoffman, C. Rubke, M. Ingraldi, P. Kennedy, R. Wilcox
- Reclamation- A. Calvert, J. Smith, S. Kokos, M. Reilly, J. Hill