

Relict Leopard Frog Conservation



desert conservation
PROGRAM
respect, protect and enjoy our desert!



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- ³ Nevada Department of Wildlife

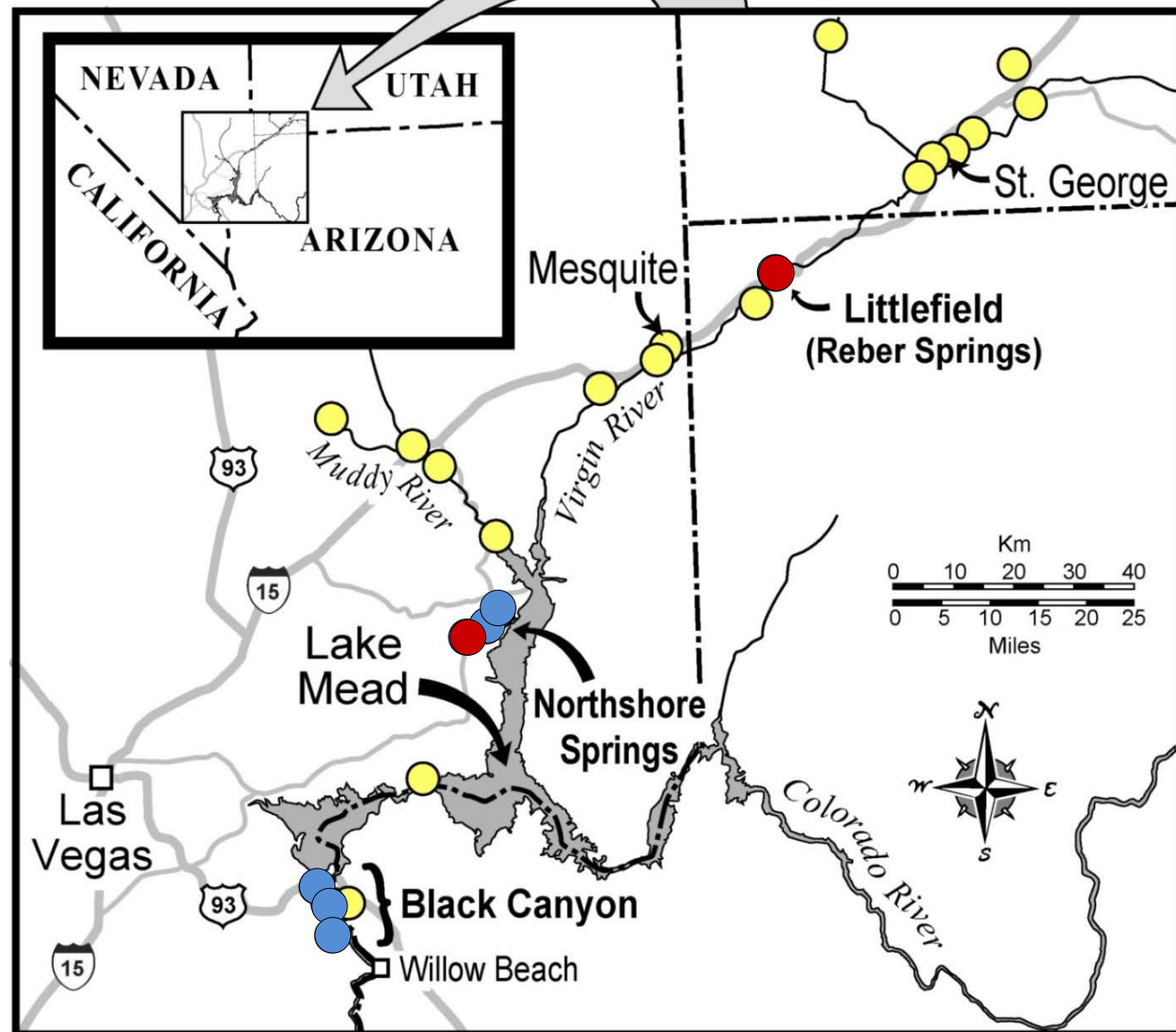


Clark County MSHCP Annual Project Progress Report Symposium
21 August 2014, Project: 2009-NPS-810A

Background

- Historical decline
- Population losses in 1990s
- Overall population estimated at 1,100 frogs in 2001
> half at one site
- Petitioned for listing under ESA in 2002

Minimum Historical Locations



From Bradford, Jaeger, & Jennings 2004

Background

Conservation Team (RLFCT)

Voluntary CAS, 2005

- Monitor populations
- Establish additional populations
- Enhance or create habitat
- Manage populations and habitats to promote sustainability
- Investigate species biology and apply findings to management

CONSERVATION AGREEMENT AND
RANGEWIDE CONSERVATION ASSESSMENT AND
STRATEGY FOR THE RELICT LEOPARD FROG (*RANA ONCA*)



FINAL

Prepared by the Relict Leopard Frog Conservation Team

July 2005

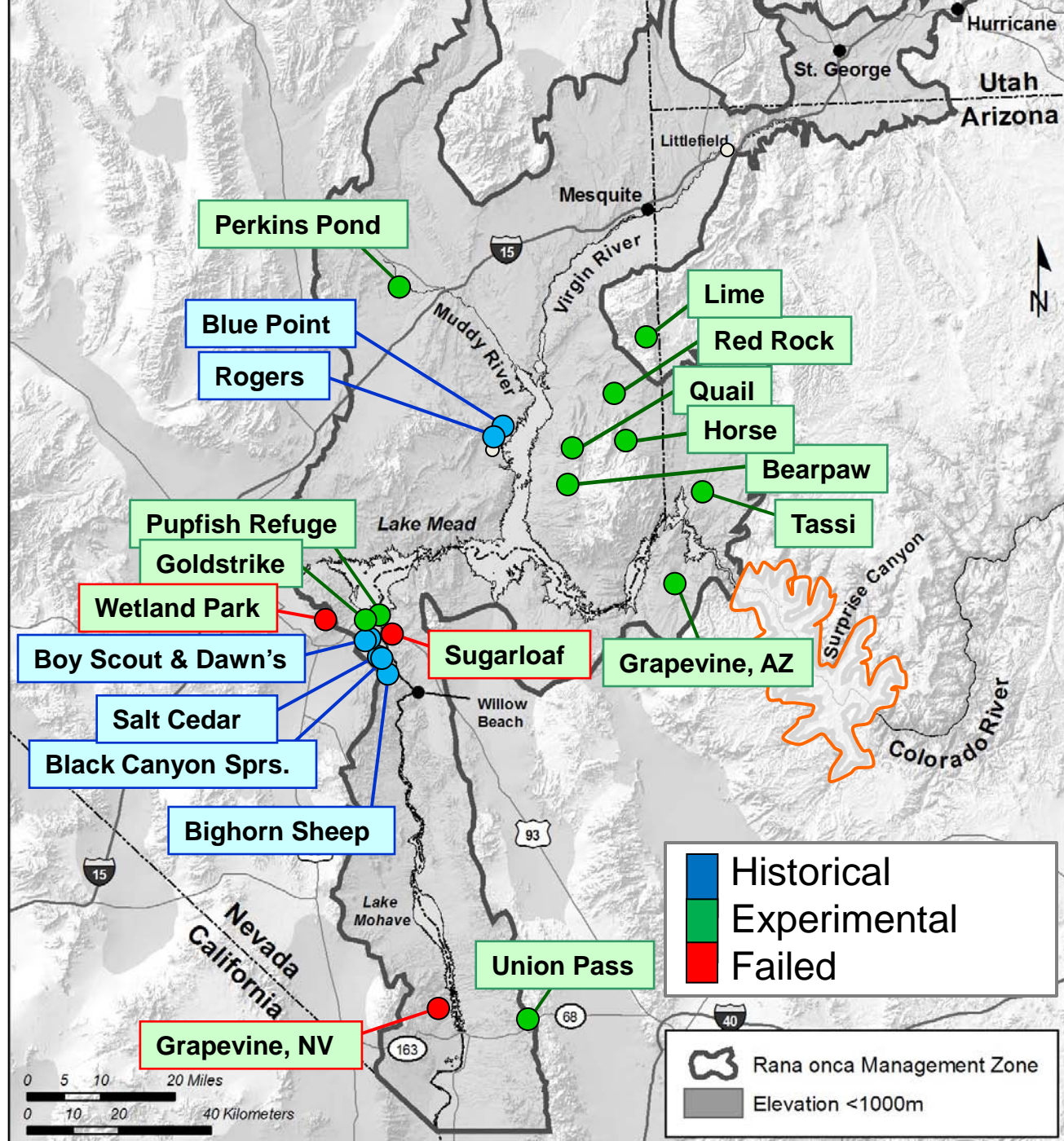
Agreements – And Important Extensions

- MSHCP 810A awarded to NPS
 - Subsequent agreement between NPS and UNLV
 - Synergistic agreement between NDOW and UNLV (1/3 match with funding from USFWS)
- ✓ Agreements extend into the later parts of 2015



Current Status

- 6-9 Historical sites
- 14 Experimental sites (11 Extant)
- Management zone



□ Jaeger & Drost 2010
Unpublished

Outline – Actions over the last year

- ✓ Habitat management
- ✓ Headstarting & Translocation
 - Rearing facilities
 - Release numbers
 - Site assessments
 - Potential sites
- ✓ Monitoring
 - Visual encounter surveys
- ✓ Estimating overall population size (USFWS funded)

All data presented herein are provisional

Habitat Management

Minor component of project

- Maintain important breeding pools
- Trim encroaching vegetation from important habitat
- Assist agency actions

Recent actions:

- Perkins Pond
- Blue Point Spring
- Boy Scout Canyon Springs



NDOW employee clearing vegetation from bullfrog exclusion fence at Perkins Pond, 2013

Habitat Management



Perkins Pond

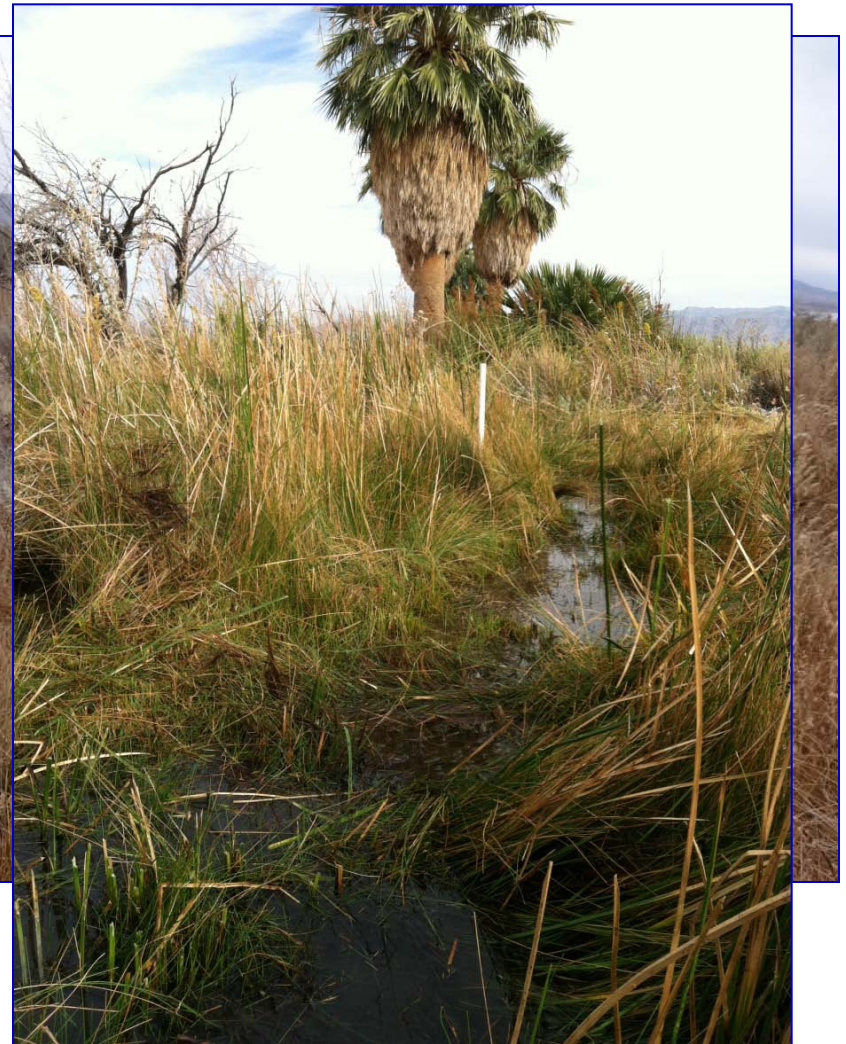
NDOW, CCDTCP, UNLV efforts Dec 2013 – April 2014

- Trimmed vegetation from around exclusion fence
- Added cottonwood logs to pond
- Converted inflow ditch to a pipe system (to reduce blockage)

Habitat Management

Blue Point Spring

Vegetation and pool maintenance by UNLV and NDOW personnel



“Upper” Blue Point following cutting, Nov 2013

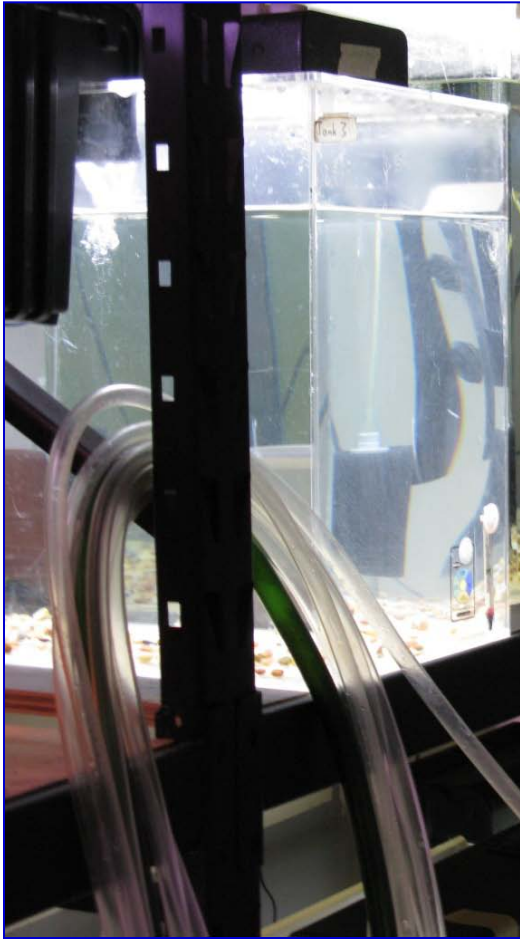
Headstarting & Translocation

Eggs collected from the wild each year, reared to late-stage tadpoles or small frogs, then released



Headstarting & Translocation

Rearing Facilities 2014



NPS facility (ca 2012)

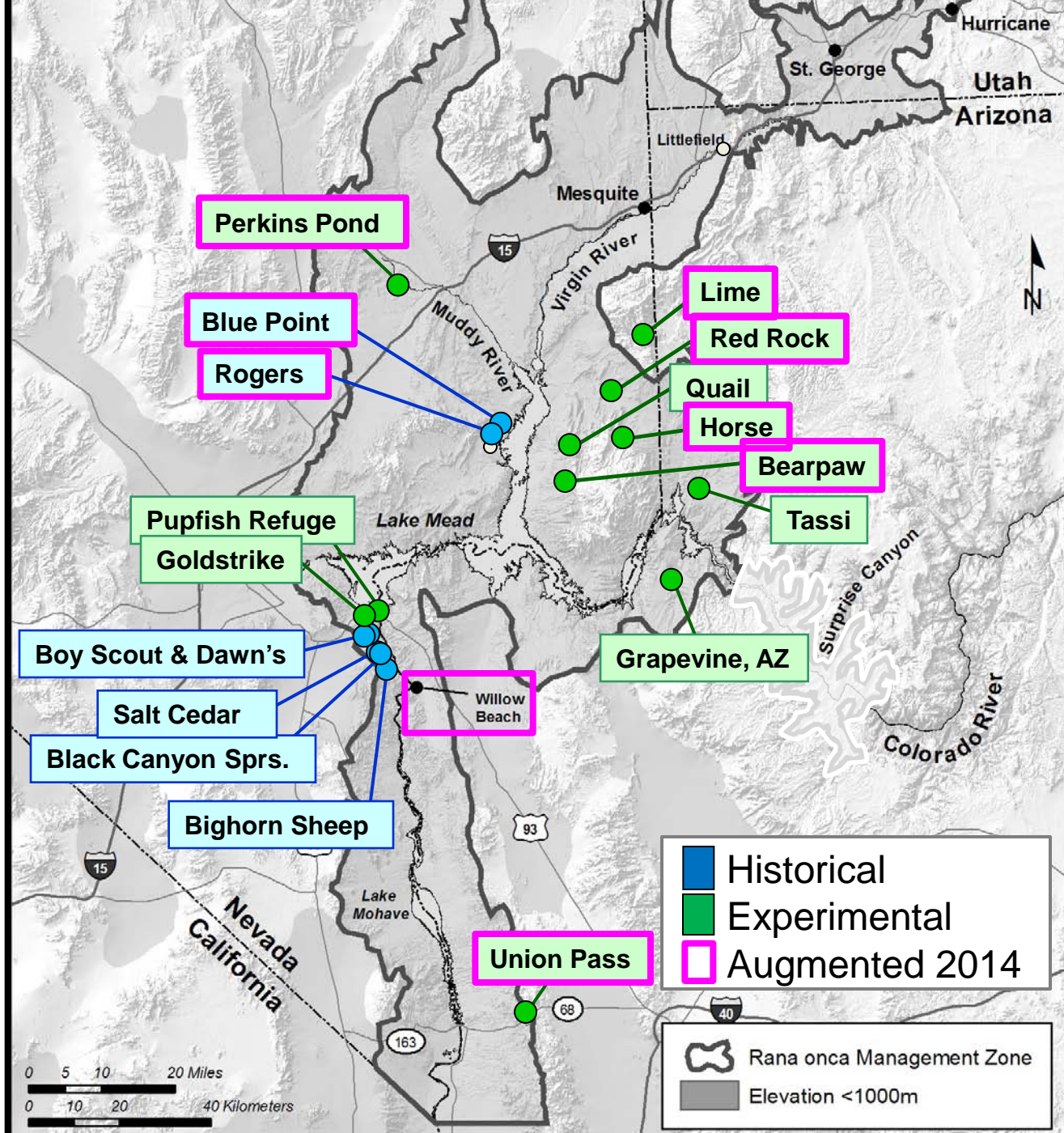


Willow Beach National Fish Hatchery, 2014

Headstarting & Translocation

This year:

- 358 late-stage tadpoles & 339 juvenile frogs
- Released to 6 experimental sites (plus Willow Beach)
- Blue Point & Rogers springs
- 54 additional frogs to *Bd* experiment at UNLV



Status of Experimental Sites

Experimental sites of active augmentation

Site Name	Release Years	No. Released (Larva & Frogs)	Over-Winter	Breed	Recruit	Frogs Counted Spring 2014
Bearpaw*	2012-14	545	Yes	-	-	51
Horse*	2012-14	384	Yes	Yes	-	24
Lime	2012-14	413	Yes	-	-	15
Union Pass	2011-14	834	Yes	Yes	-	135
Perkins*	2010-14	1819	Yes	-	-	1
Red Rock	2005-10 2013-14	813	Yes	Yes	-	6

* Animals from Blue Point, other sites received Black Canyon animals

Status of Experimental Sites

Augmentations complete

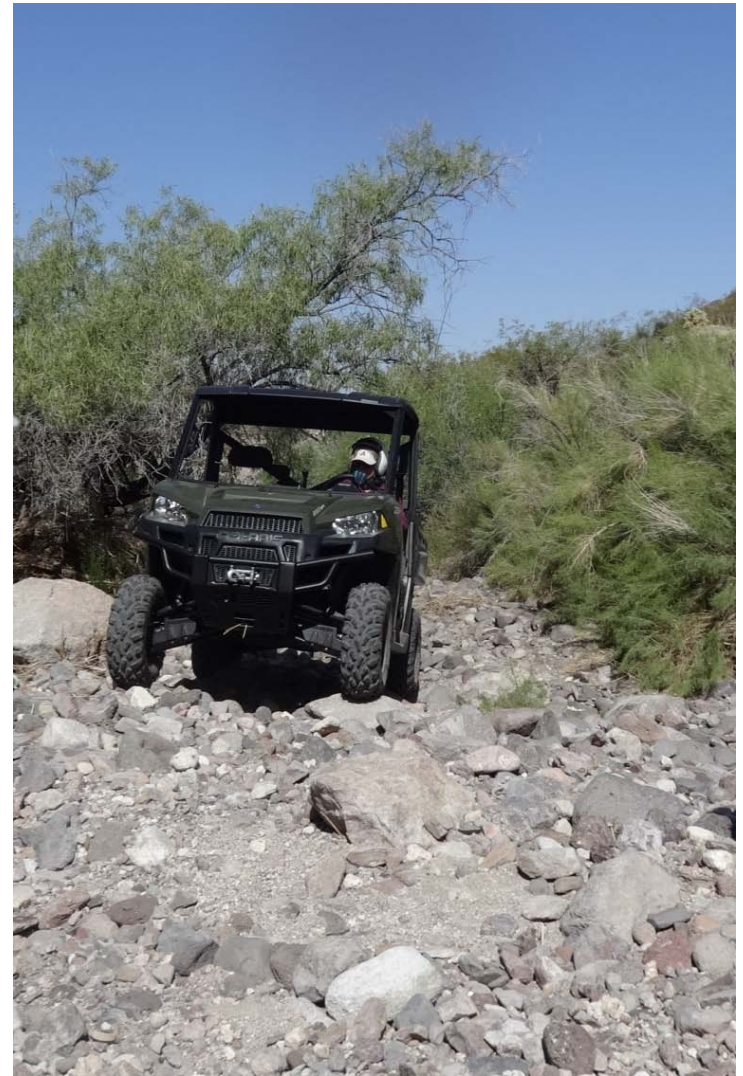
Site Name	Release Years	No. Released (Larva & Frogs)	Over-Winter	Breed	Recruit	Frogs Counted Spring 2014
Goldstrike	2004-09 2013	2296	Yes	Yes	Yes	26
Quail	2008-12	597	Yes	Yes	Yes	164
Tassi	2006-10	1198	Yes	Yes	Yes	107
Grapevine, NV	2006-07	1145	Yes	-	-	Failed
Grapevine, AZ	2004-09	3820	Yes	Yes	Yes	116
Pupfish	2003-08	541	Yes	Yes	Yes	39
Sugarloaf	2002-05	539	Yes	Yes	-	Failed
Wetland Park	2000-01	297	-	-	-	Failed

Release records from 2000-2004 are not clear

Headstarting & Translocations

Site assessments for potential translocations

- Corn Creek, Desert National Wildlife Refuge, NV
- Flag & Cottonwood springs, Black Mountains, AZ



On the road to Cottonwood Spring

Headstarting & Translocations

Corn Creek, Desert National Wildlife Refuge, NV

Surveyed April 2014 by personnel from UNLV & USFWS



Issues:

- Bullfrogs, crayfish, predatory fish, potential disease?
- Management goals

Positives:

- Consistent surface water
- Habitat

Headstarting & Translocations

Flag & Cottonwood springs, Black Mountains, AZ

Surveyed in June 2014 by UNLV, AGFD, BLM personnel



Positives:

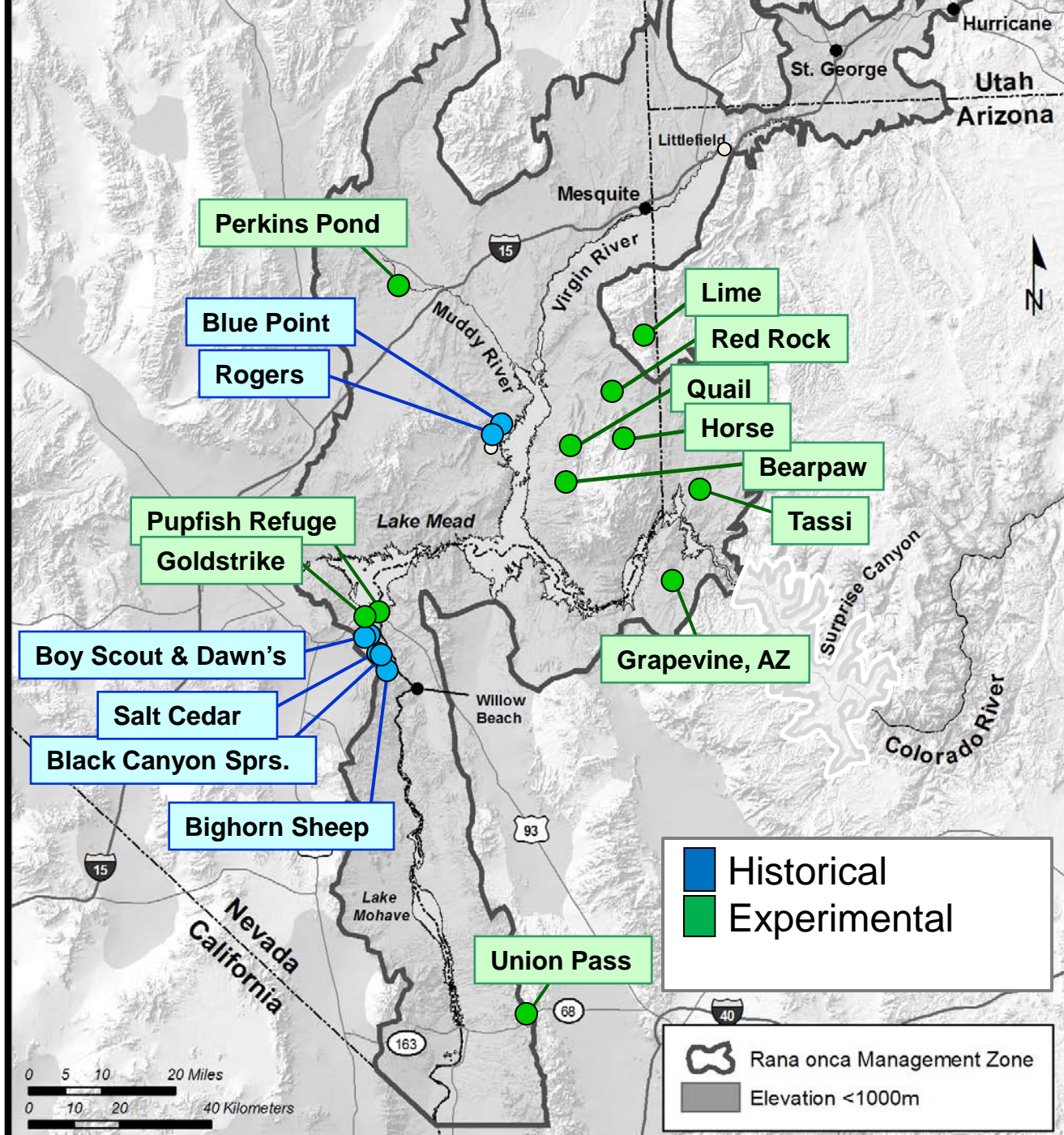
- Consistent surface water
- Habitat

Issues:

- Spring sites are on patented land

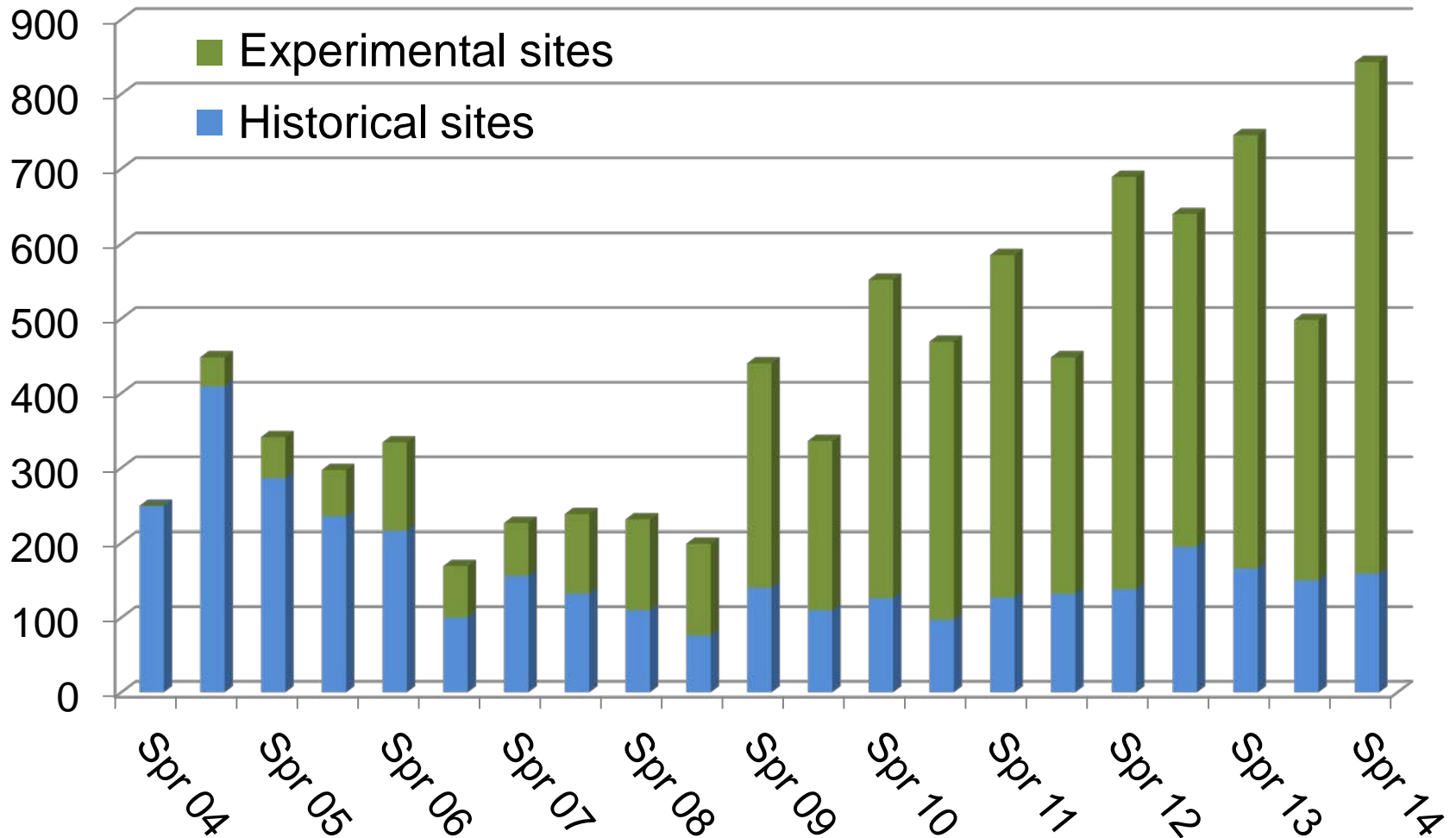
Monitoring

- Diurnal and nocturnal visual encounter surveys
- During spring and fall
- Provide 'counts' at each site (relative abundance)



Monitoring

High counts (VES) of adult & juvenile frogs



Overall Population Estimation

UNLV effort with funding from USFWS

Double sampling:

- Calibrate indices of relative abundance from Visual Encounter Surveys (VES) by finding the relationship with true abundance estimated by Mark-recapture (MR)



Overall Population Estimation

General Approach:

- Relative abundances (RA) from Visual Encounter Surveys
- True abundance (TA) from Mark-recapture
- Generate ratio estimates
- Applied ratio to sites where only VES data is available

The diagram illustrates the relationship between three variables in population estimation. On the left, a blue-bordered box contains the ratio estimate $\left(\frac{X_{TA}}{X_{RA}} \right)$, with the label "Ratio Estimate" below it. In the center, an orange-bordered box contains the relative abundance Y_{RA} , with the label "Relative Abundance" below it. To the right of the orange box is an equals sign. On the far right, a pink-bordered box contains the population estimate Y_{Est} , with the label "Population Estimate" below it.

$$\left(\frac{X_{TA}}{X_{RA}} \right) \cdot Y_{RA} = Y_{Est}$$

Ratio Estimate Relative Abundance Population Estimate

Overall Population Estimation

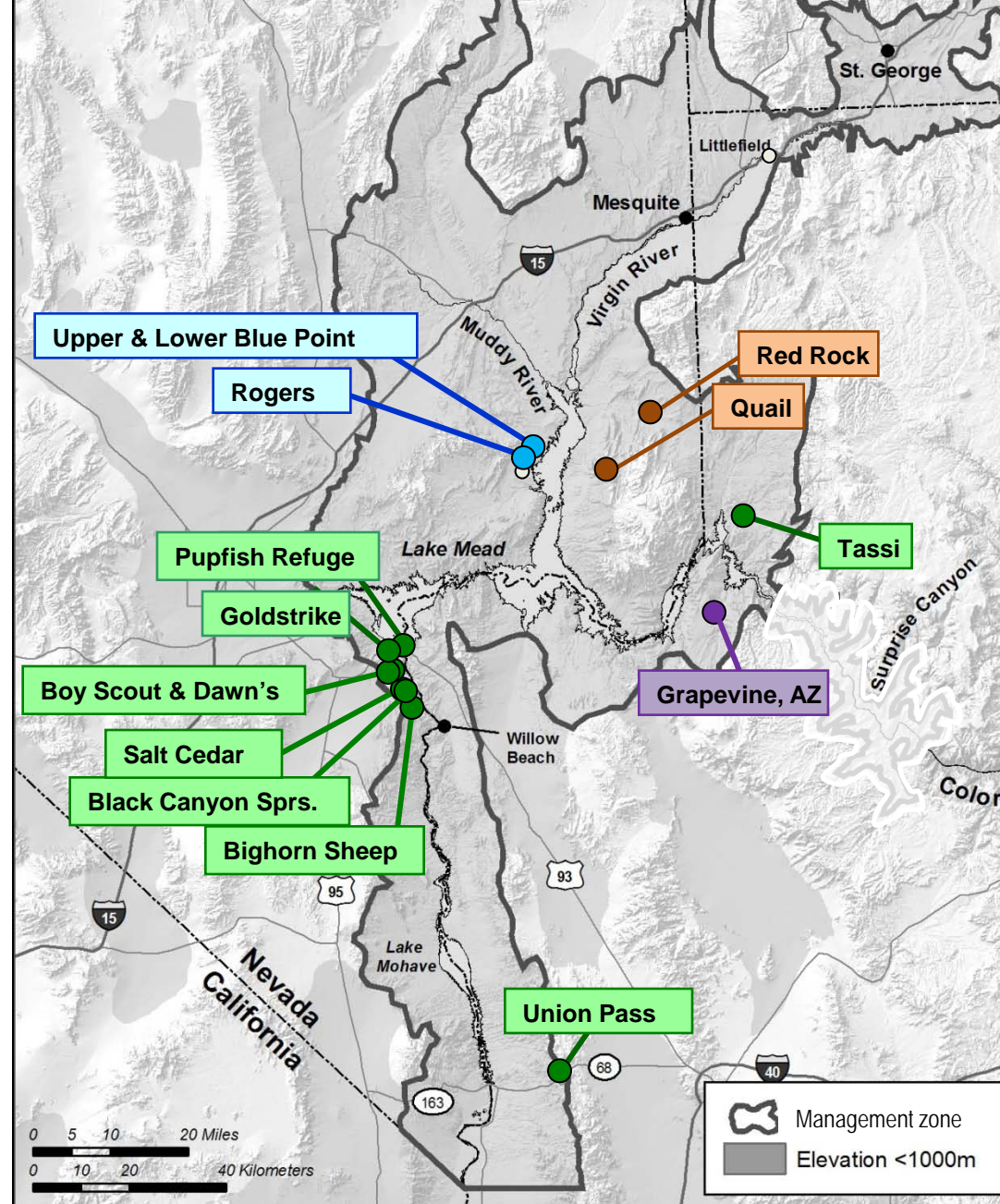
- Mark-recapture conducted at four representative sites concurrently with Visual Encounter Surveys

Estimates calculated in 2012

Site	Mark Recapture <i>N</i> (95% CL)	VES Range	Avg Ratio Estimate
Red Rock	19 (18–24)	10-15	67%
Upper Blue Point	56 (50–84)	19-26	38%
Pupfish Refuge	75 (70–86)	21-45	39%
Grapevine	510 (400–737)	90-179	22%
Overall Average			37.4%

Provisional Population Estimate

- Estimate in Spring 2012
- Combination of MR estimates from 4 sites and calibrated abundances from other sites (3 sites excluded)
- ~ 1,500 or 1,700 adult frogs (range 1,340–2,326)
- Bradford et al (2004) estimated 1,100 adult frogs (range 693–1,833)



Future Direction of RLFCT

- Continue current levels of monitoring and management
- Update species assessment
- Assuming positive reviews of species status – Develop transition to a more programmatic management approach

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Funding:

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Cooperators:

- Bureau of Reclamation
- Bureau of Land Management
- Arizona Game & Fish Department



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We also thank members of the
RLFCT...and many others..!



UNLV
UNIVERSITY OF NEVADA LAS VEGAS

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for field work this
period:

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Mitch Urban
Anthony Waddle
Michael Webber
Carla Wise



Tadpole released at Union Pass Spring, 2014

Photos credits: Jef Jaeger and Rebeca Rivera