Relict Leopard Frog Monitoring and Management

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On behalf of Lead Agency:
Lake Mead National Recreation Area

1. Public Lands Institute & School of Life Sciences, UNLV
2. Resource Management, Lake Mead National Recreation Area, NPS

Clark County MSHCP Annual Project Progress Report Symposium, 11 August 2010, Project: 2005-NPS-476-P

Background

Petition in 2002 to list as endangered

Voluntary CAS signed in 2005

- Monitor populations
- Establish additional populations in existing or created habitat
- 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*)

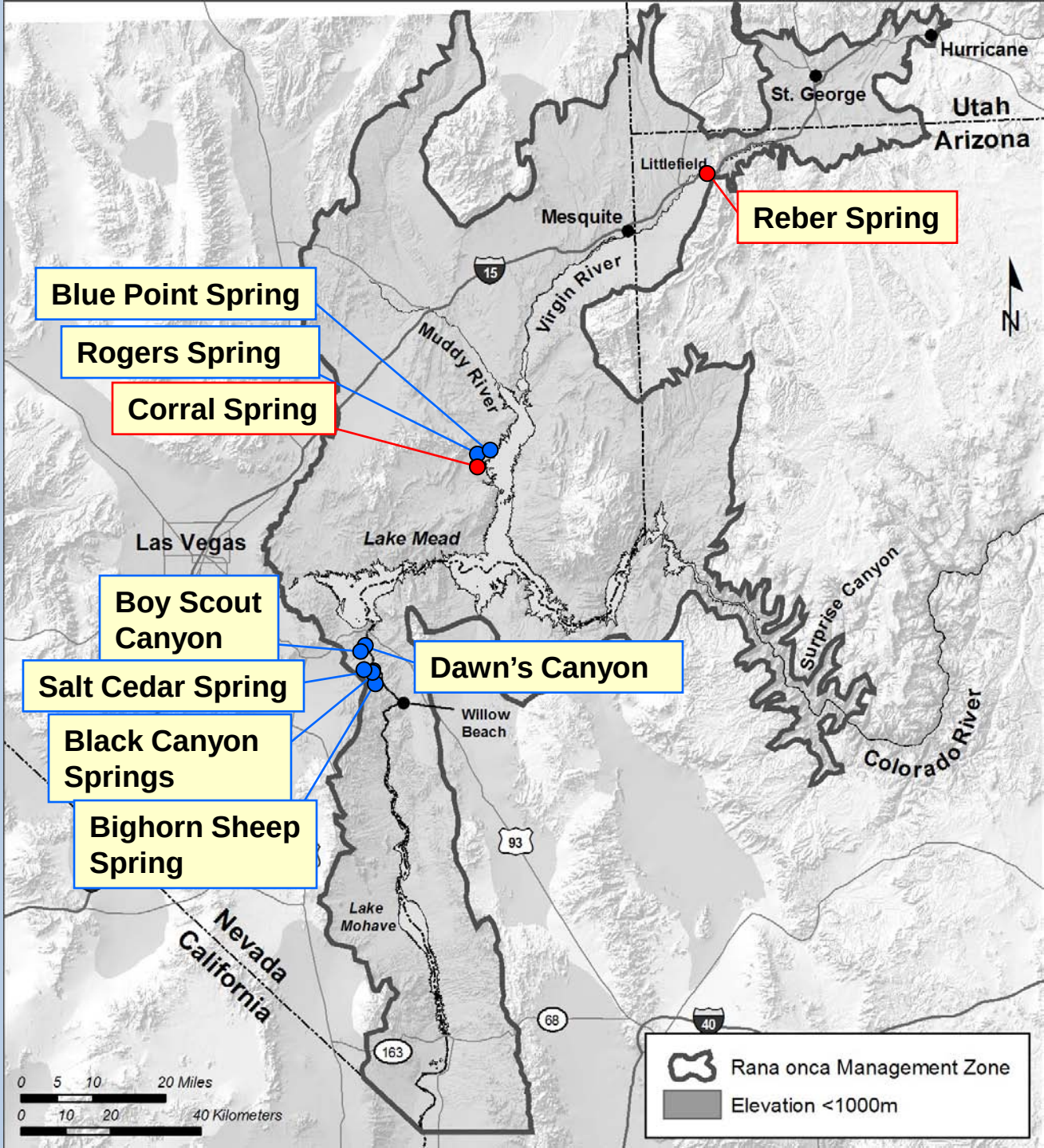
FINAL

Prepared by the Relict Leopard Frog Conservation Team

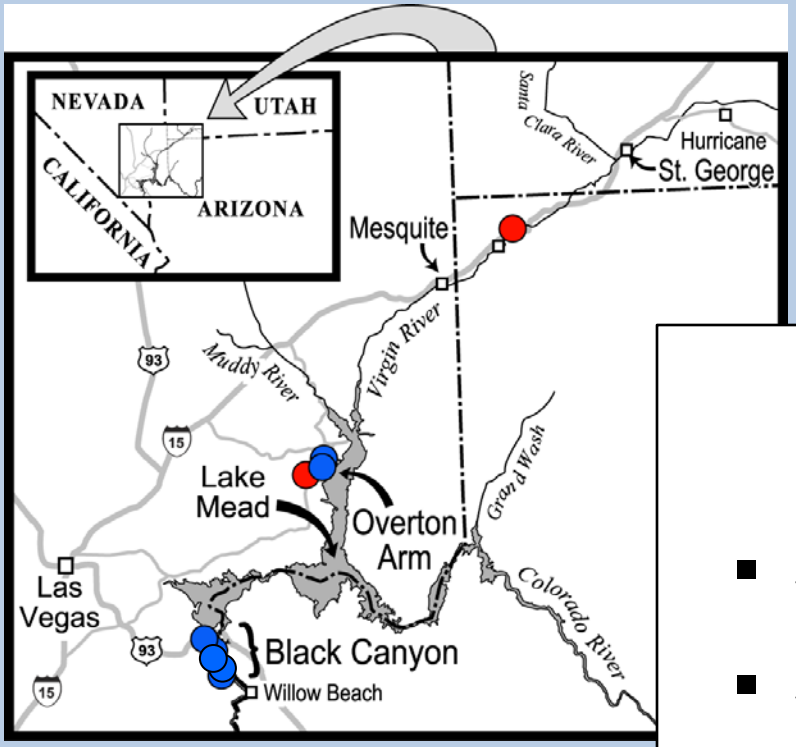
July 2005

Background

- Currently, 5–9 extant natural ‘sites’ (depending on how you count)
- Two known sites extirpated between1994-2001



Background –
Recent Declines

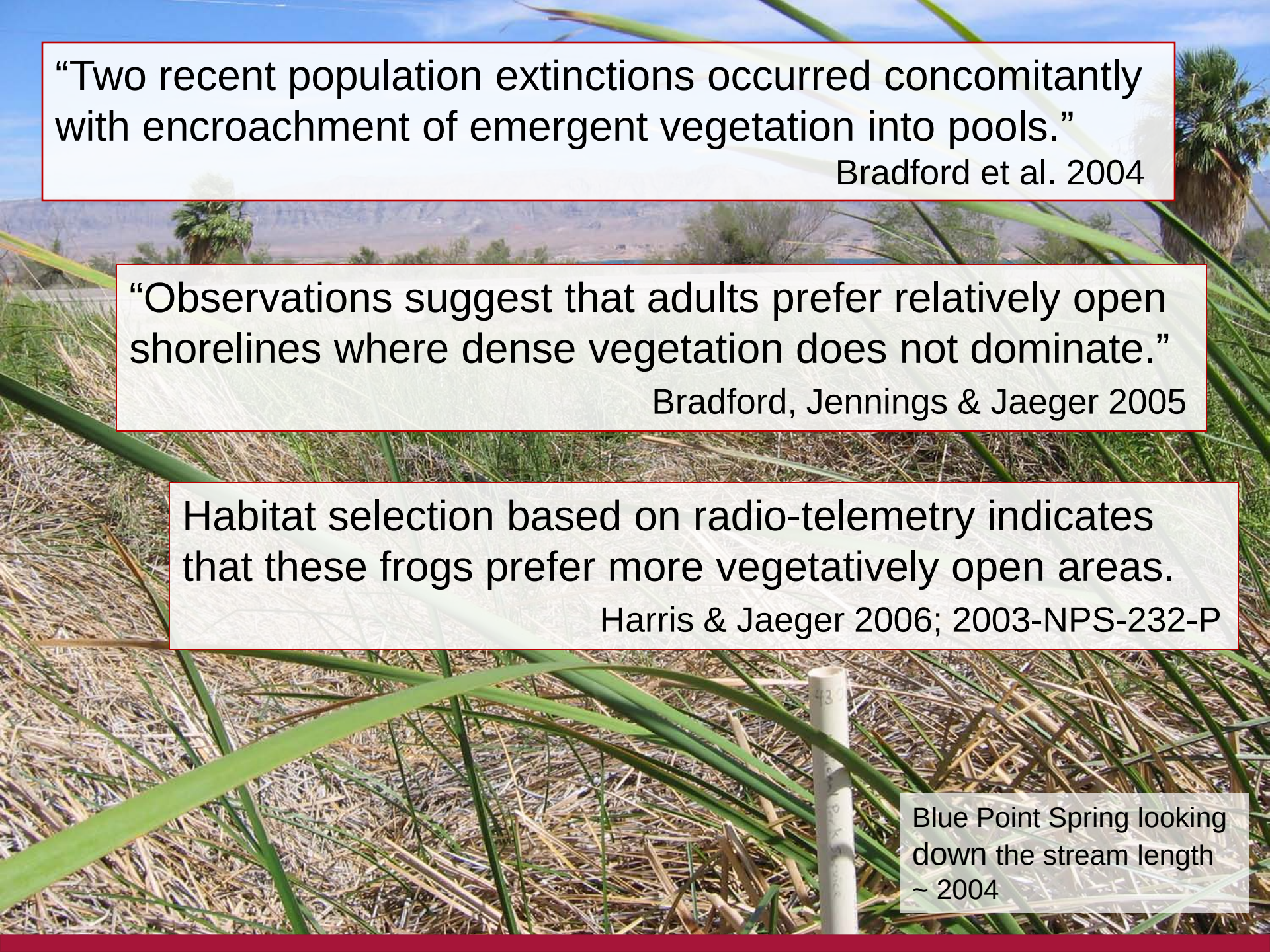


From: Bradford, Jaeger, & Jennings 2004

Reber Spring

- Surveys in 1998: Adults & Tadpoles
- Surveys in 2001: *No Rana onca*

➢ Emergent vegetation encroachment was obvious…



"Two recent population extinctions occurred concomitantly with encroachment of emergent vegetation into pools."

Bradford et al. 2004

"Observations suggest that adults prefer relatively open shorelines where dense vegetation does not dominate."

Bradford, Jennings & Jaeger 2005

Habitat selection based on radio-telemetry indicates that these frogs prefer more vegetatively open areas.

Harris & Jaeger 2006; 2003-NPS-232-P

Blue Point Spring looking down the stream length ~ 2004

Disturbance Has Declined

Burro (and cattle) grazing has been essentially eliminated in the Northshore area in recent years.

Grazed area once favored by frogs at Blue Point Spring, August 2004

Same area, August 2010

Vegetation Treatments

Jaeger, Graham, & Engel 2009
2005-UNLV-597-P

2007

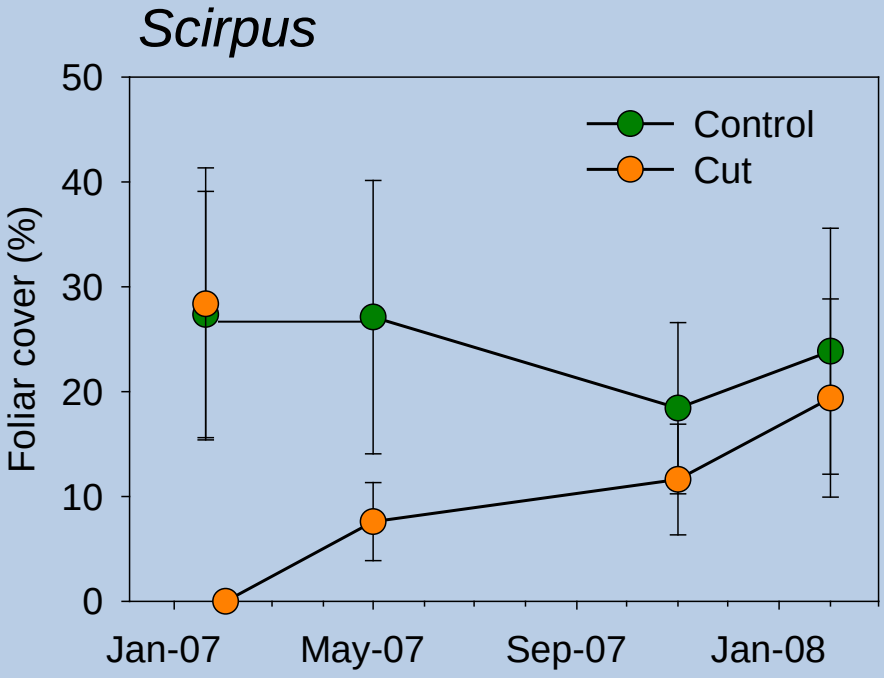
Sawgrass *(Cladium)*
at Rogers Spring

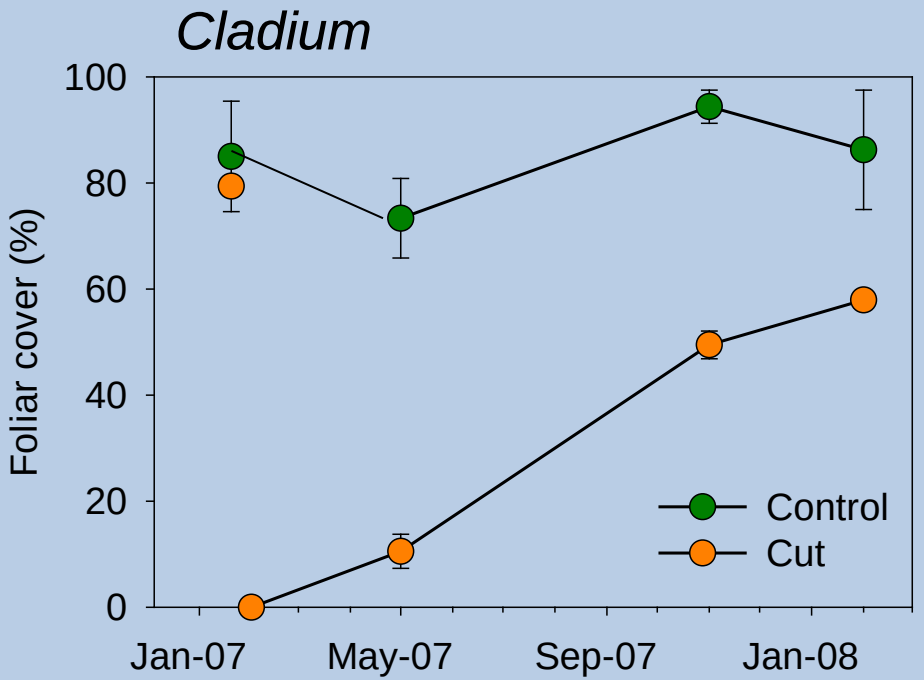
Treatment Monitoring

UNLV researchers collecting vegetation response data

Vegetation Responses to Treatments

- Plant species richness and composition unresponsive
- Sedge dominated vegetation *(Eleocharis & Scirpus)* returned to pre-cut conditions < one-year*
- *Cladium* (cut) somewhat slower to re-establish < two-years*





Example Data…All values 1 S.E.

Quail Spring, early 2008

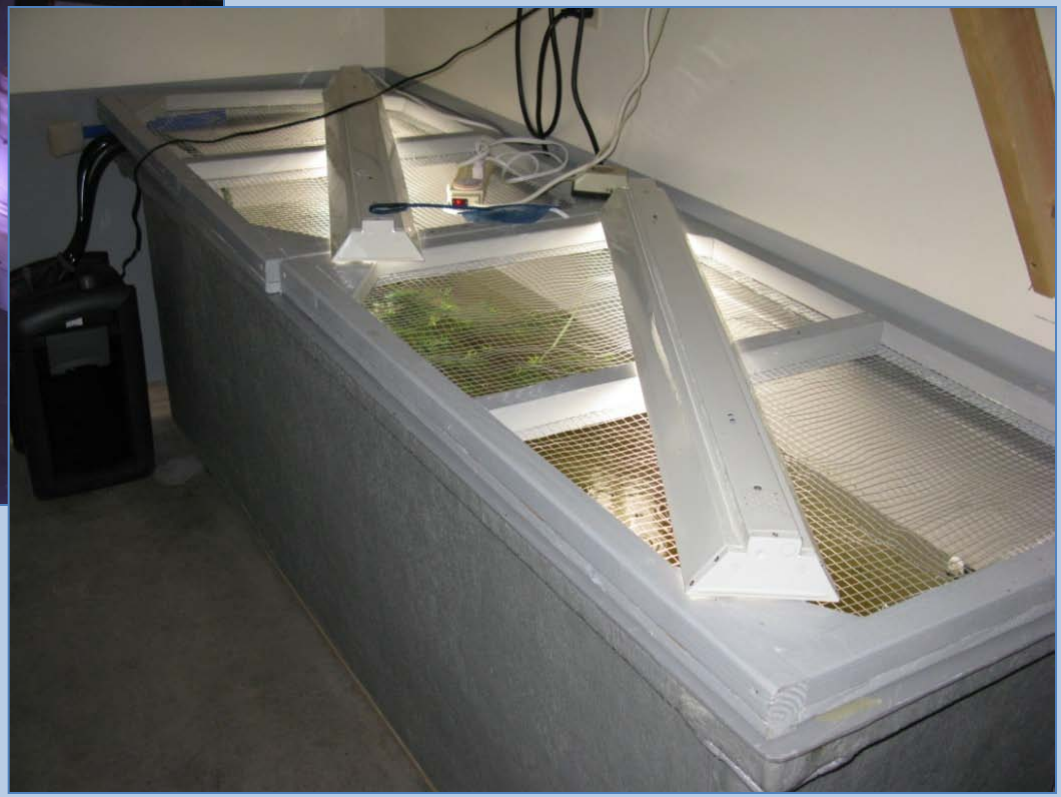
NCC and UNLV crew working on BLM habitat improvement project

Quail Spring, Spring 2008

July 2010

Photo courtesy Mark Slaughter, BLM

Headstarting, Reintroductions & Translocations



Lake Mead ‘Frog Lab’, 2008

Also raceways at Willow Beach National Fish Hatchery for grow-out

Perkins Pond – Established as an experimental site this year

- 372 tadpoles released in May
- 23 Juveniles counted during a survey in July…

Bullfrog exclusion fence at Perkins Pond

Tadpoles released at Perkins Pond

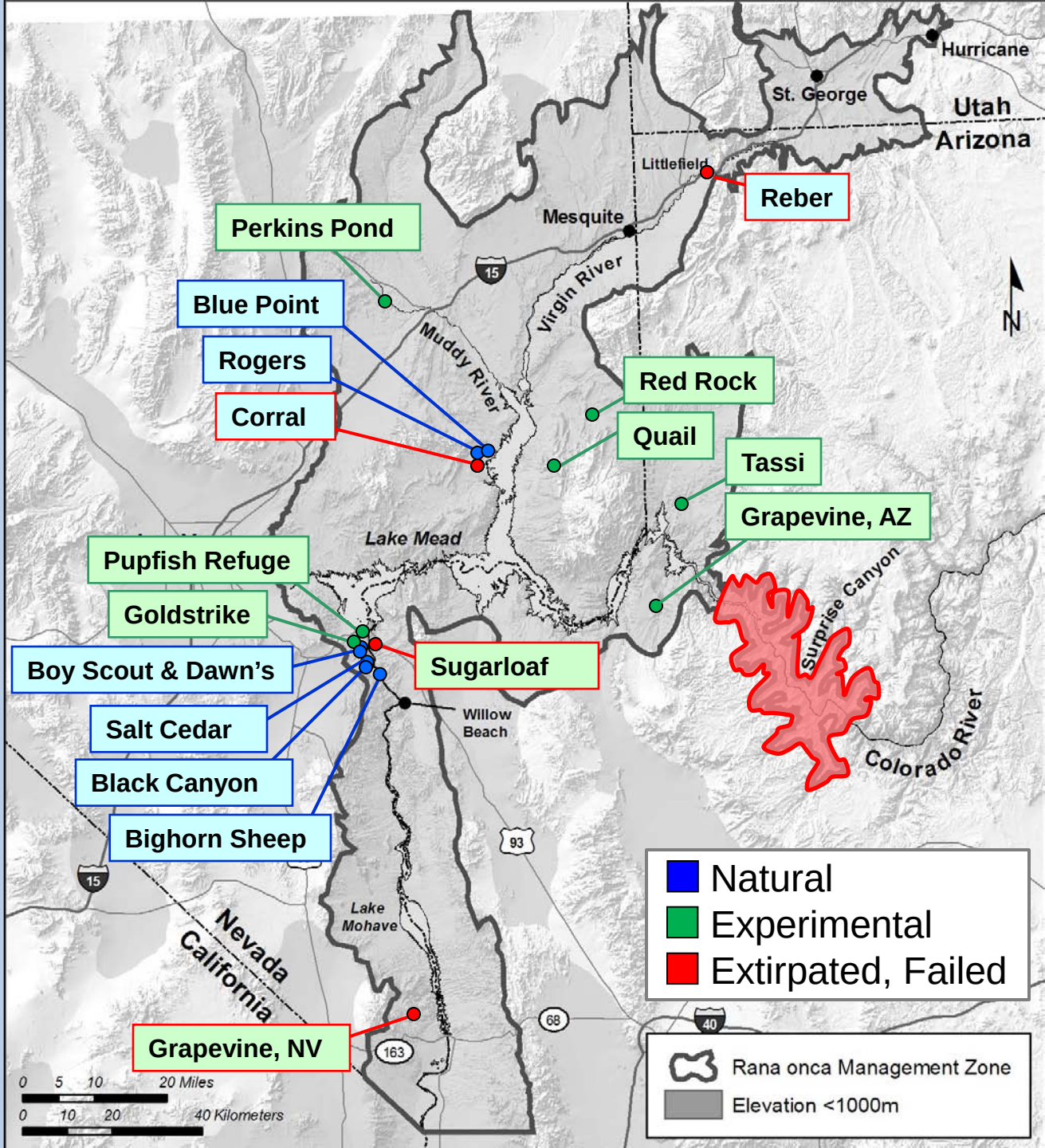
Current Status
2002-2010

- ~5-6 Natural 'Populations'
- 9 Experimental Sites…
- 7 Extant Experimental Populations

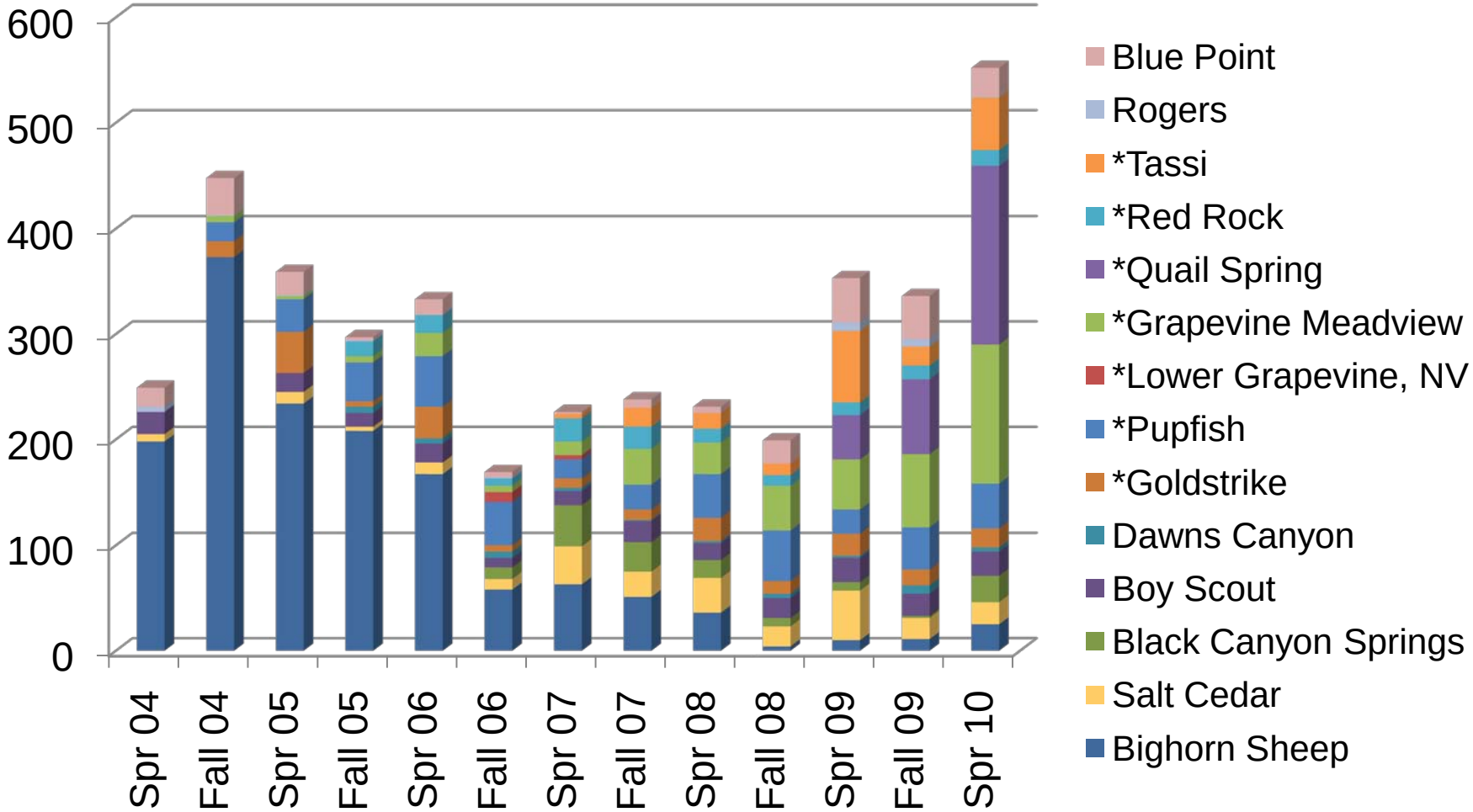
- *R.yavapaiensis* in Surprise Canyon

Olah-Hemmings, et al. 2010;

Jaeger & Drost 2010, 2005-UNLV-575-P

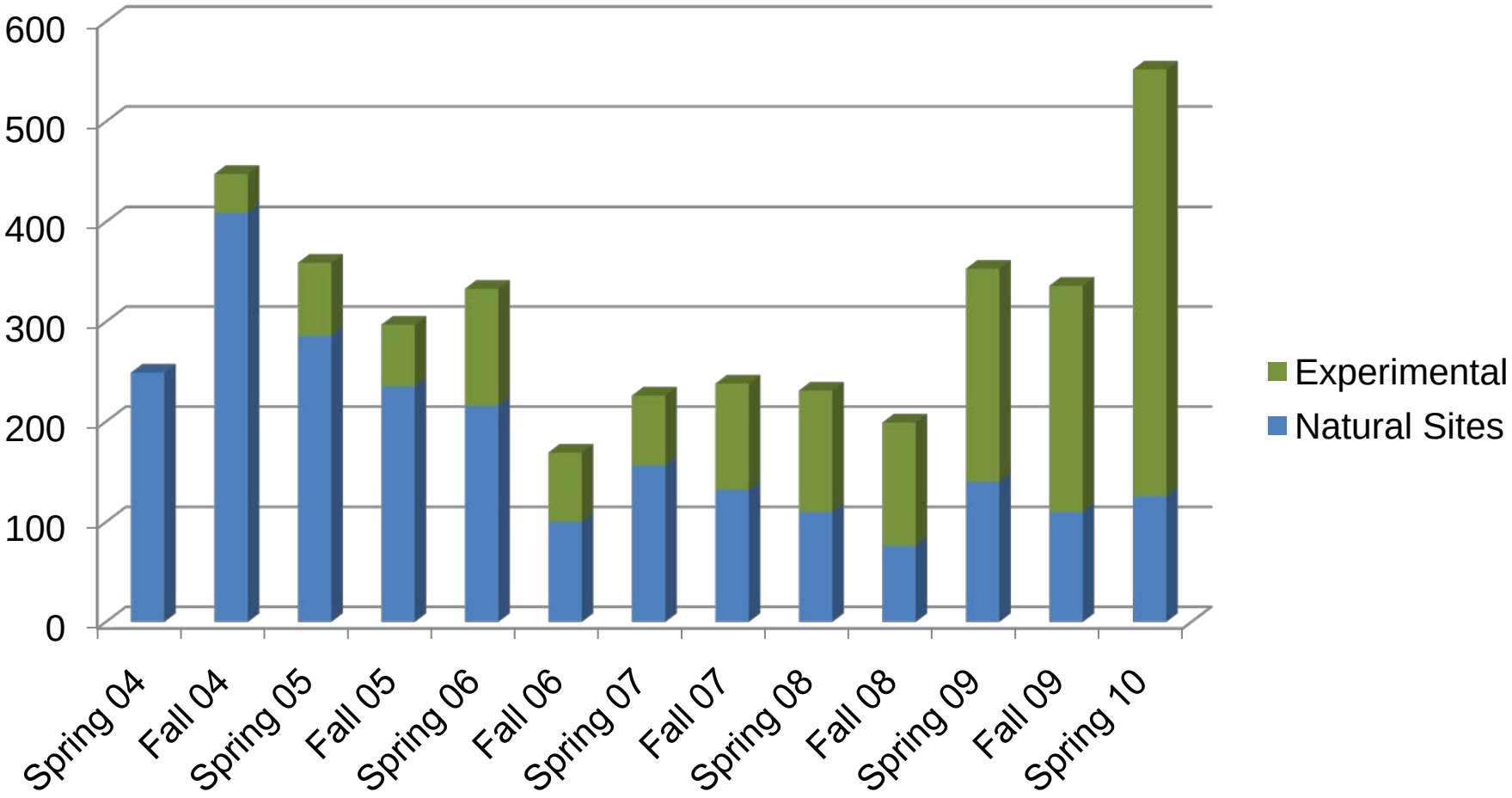


Summary of nocturnal VES results for adult & juvenile frogs



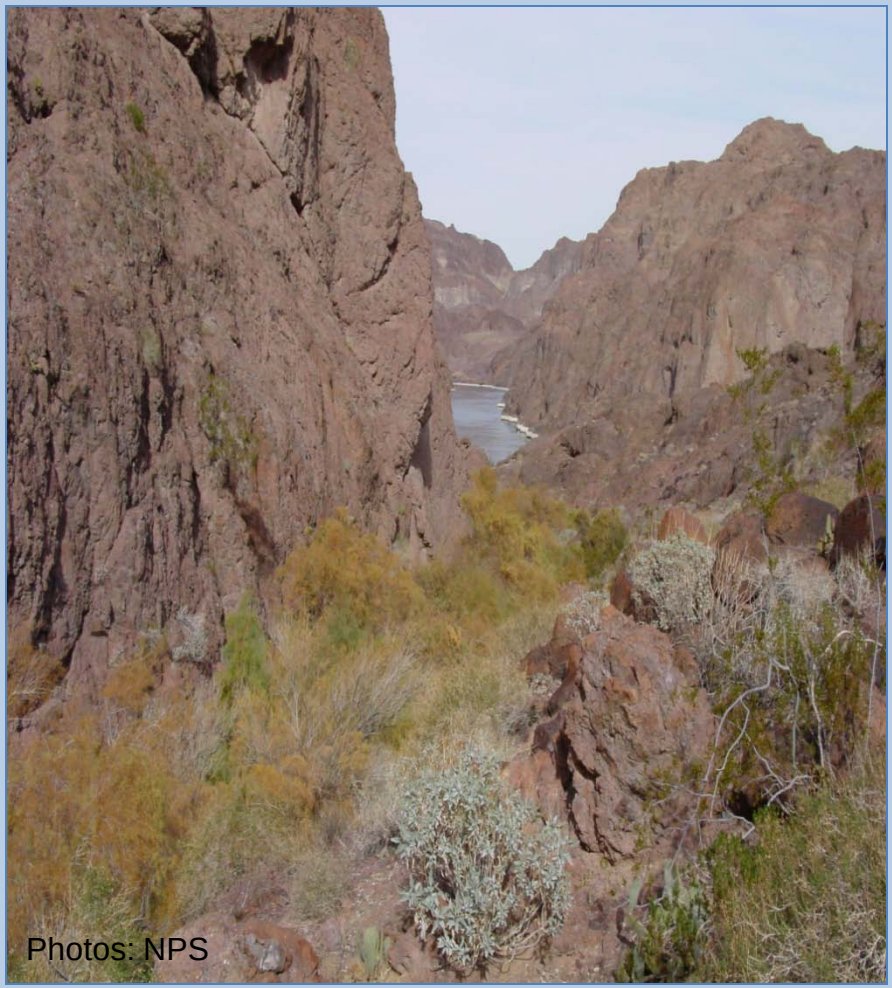
Provisional Data

Summary of VES results for adult & juvenile frogs



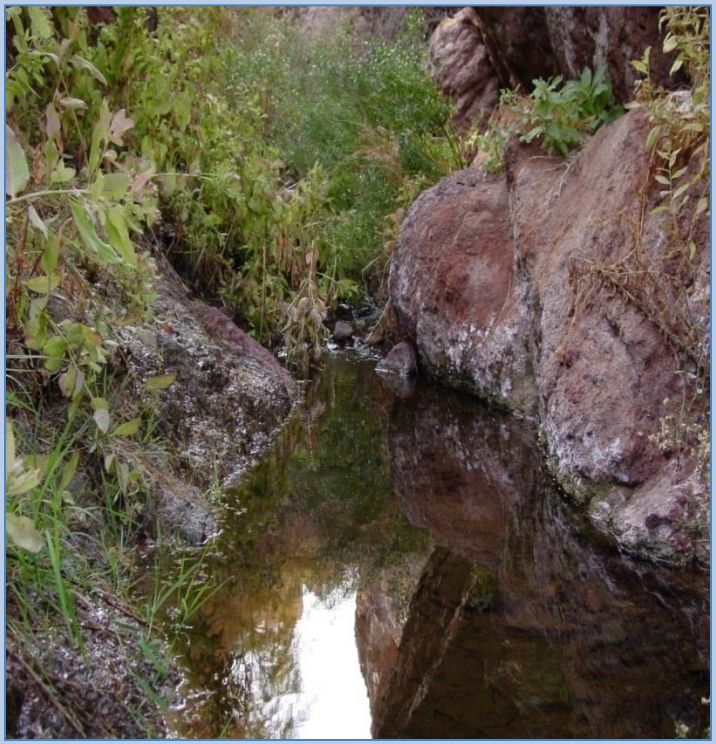
Provisional Data

Bighorn Sheep Spring


Photos: NPS

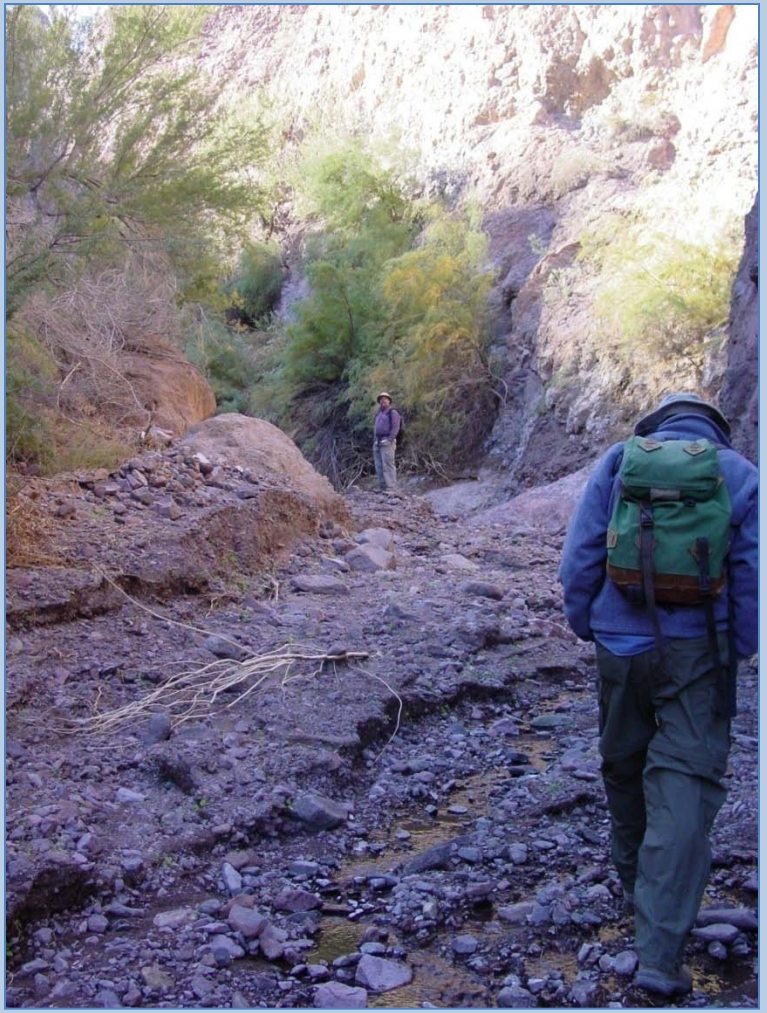
Mark-Recapture Estimate:
637 frogs, 95% (C.L. 381-1210)
~50% of total frog population

Bradford et al. 2001



- VES this spring returned 25 frogs
  (an order of magnitude less than during peak VES counts in 2004-05)

Bighorn Sheep Spring, 2006



Hossain, 2010. On the empirical relationship between large dams and the alteration in extreme precipitation

Natural Hazards Review

Bighorn Sheep Spring
Habitat Restoration Attempt, 2008

Other problematic sites:

- Rogers Spring: never more than single digit VES counts, but returns were 0 during 2007 & 2008…
- Blue Point Spring: Mark-recapture estimates at upper section dropped to single digits in 2007 & 2008, also very low counts along lower section…
- Both springs augmented in 2008 with lower Blue Point animals, and Blue Point augmented again in 2010...

Mark-recapture at Upper Blue Point:

Augmentation at upper Blue Point occurred during mark-recapture study

- Fall 2007 & Spring 2008 < 10 adults

  Spring 2010 = 70 adults (95% C.L. 54-99) provisional data
- Habitat management actions appear sufficient to allow long-term adult survivorship…
- …These results suggest limited recruitment from eggs and larvae as a more significant problem…

Photo from web

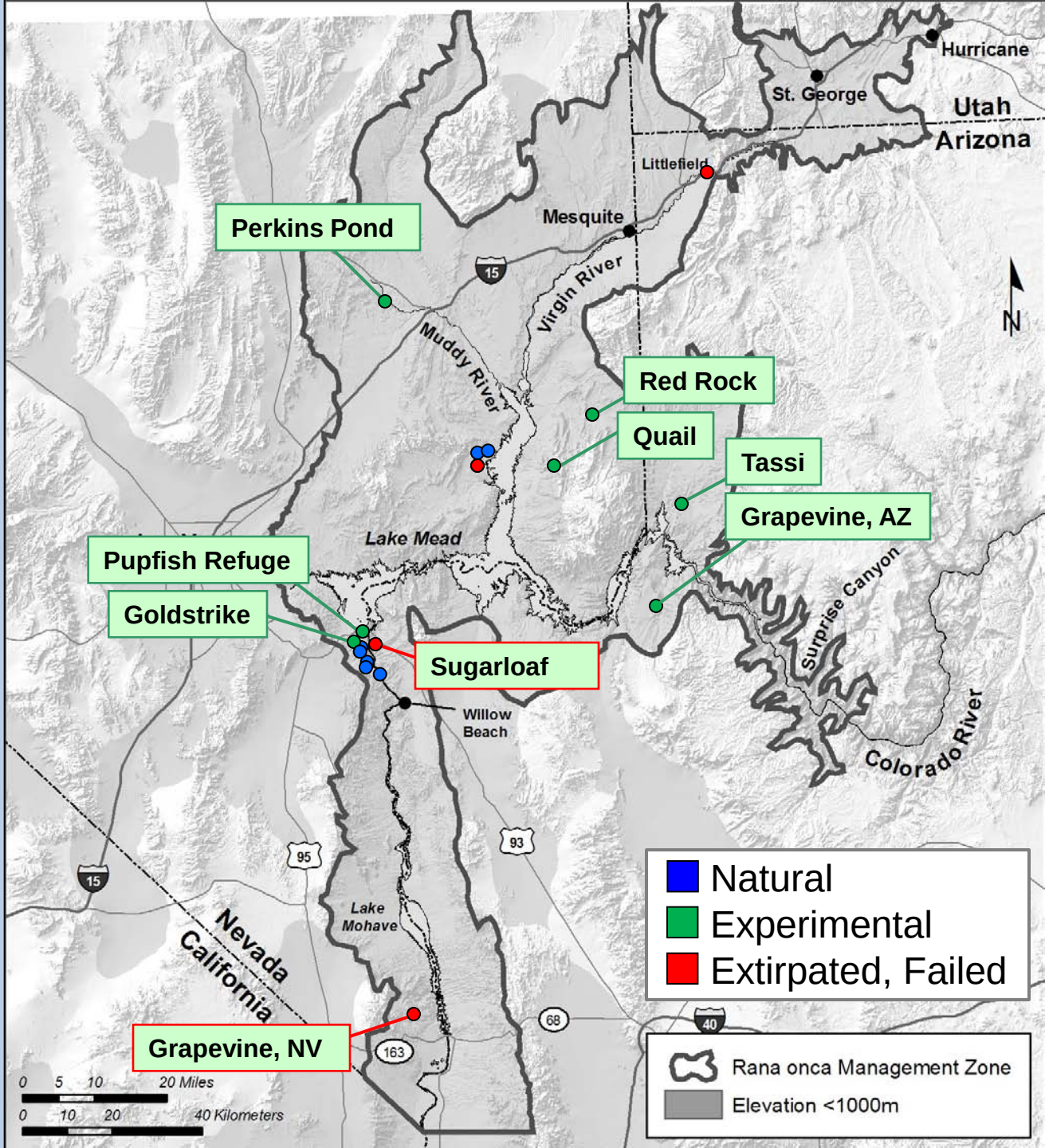
Fish-free ponds created at Upper Blue Point in Spring 2007

Fish-free pond created at
Lower Blue Point, March 2008

March 2010

469 animals raised from eggs collected in this pond
(97 returned Blue Point, the rest to Perkins Pond)

Current Status of Experimental Sites 2002-2010



Experimental Efforts and Status

Site Name	Release Years	Numbers Released (provisional data)	Over-Winter	Breeding	Current Status
Goldstrike	2004-09	2189 Tadpoles	Yes	Yes	Breeding
Grapevine, AZ	2003-09	3820 Tadpoles	Yes	Yes	Breeding
Grapevine, NV	2006-07	895 Tadpoles 250 Frogs	Yes	?	Failed (water loss)
Pupfish	2003-08	541 Frogs	Yes	Yes	Breeding
Quail	2008-10	253 Frogs 199 Tadpoles	Yes	Yes	Breeding
Red Rock	2005-10	511 Frogs 109 Tadpoles	Yes	Yes	Breeding
Sugarloaf	2003-05	372 Frogs	Yes	Yes	Failed (water loss)
Tassi	2006-10	719 Frogs 479 Tadpoles	Yes	Yes	Breeding
Perkins Pond	2010	372 Tadpoles	?	?	Active

Continuing actions under current project:

(through 2010)

- Vegetation control at Blue Point Spring, Quail Spring (participating with BLM), possibly Pupfish Refuge
- Restoration of some fish-free ponds at Blue Point
- Investigations of potential translocation sites in Gold Butte area (participating with USGS)
- Fall season nocturnal surveys (all sites)
- Headstarting facilities maintenance & modifications
- Reporting and coordinating deliverables

Acknowledgments

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R.L.F. Conservation Team

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Arizona Game & Fish Dept

Bureau of Reclamation

Clark County

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Dana Drake

Rebeca Rivera

Jon Sjoberg

Mark Slaughter

NV Conservation Corps

NPS fire crew

Lake Mead veg crew

…and many others…

Photo credits: Jef Jaeger, unless otherwise noted