



Lower Colorado River Multi-Species Conservation Program

Balancing Resource Use and Conservation

RATS!



Basic Facts

- Two isolated sub-species of two distinct species occur along the LCR.

Sigmodon arizonae plenus
(Colorado River cotton rat)

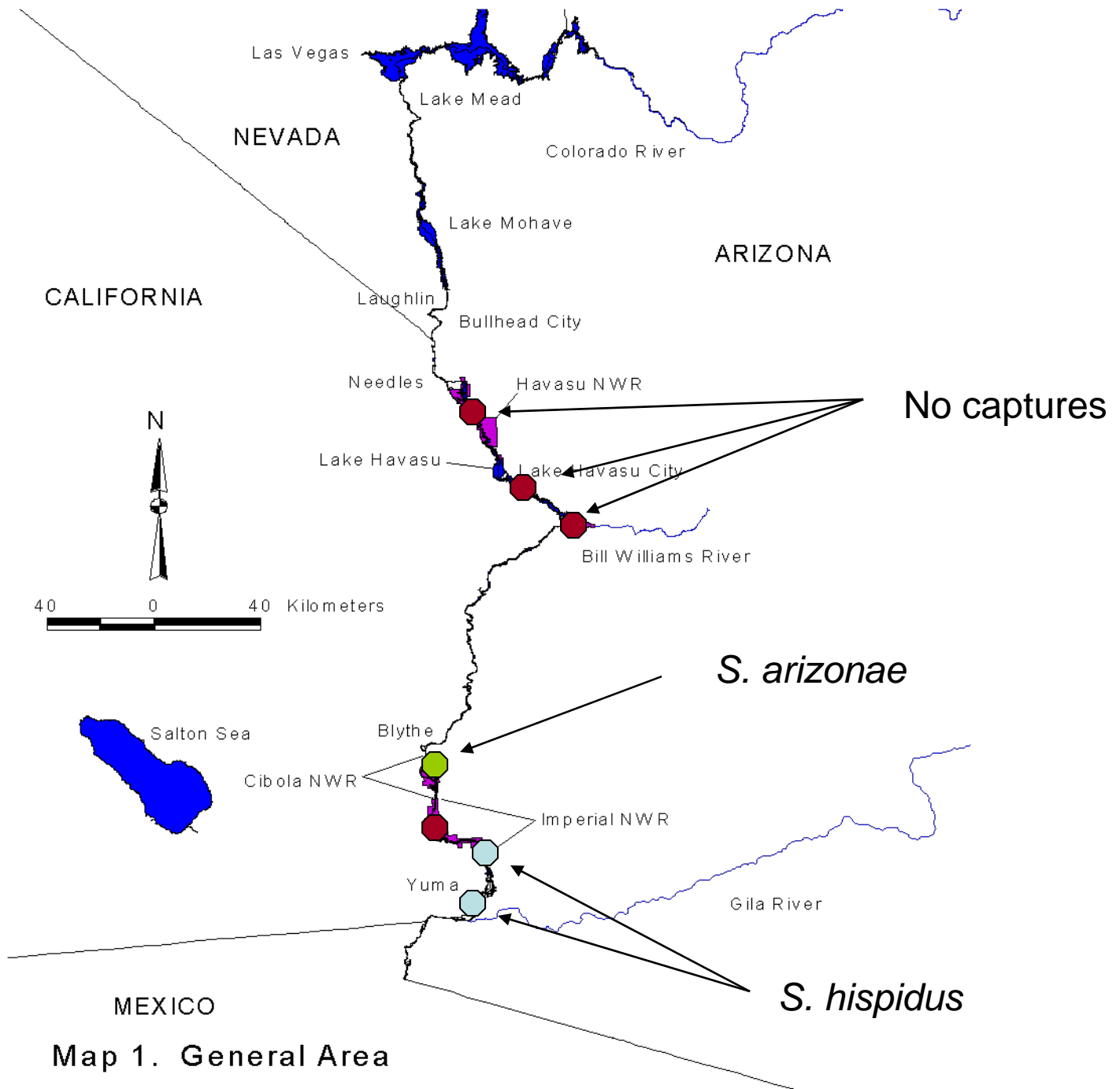
- Sub-species of the Arizona cotton rat
- It is thought to occur north of Yuma to Laughlin (approximately)

Sigmodon hispidus eremicus
(Yuma hispid cotton rat)

- Sub-species of the hispid cotton rat
- Occurs near the southernmost part of the LCR near Yuma, AZ

Background

- Reclamation began preliminary trapping of restoration sites in the winter of 2004-05
- Sigmodon spp. were captured at the Cibola Nature Trail site, and at the Pratt Ag site.
- No Sigmodon spp. have been captured at the Pratt Ag. Site since 2005. The Cibola site has seen further captures.
- In late fall 2007 a cooperative agreement was signed with UNLV and Dr. Brett Riddle.
- Project will determine range distribution of both sub-species, using DNA analysis to identify individuals to species



Map 1. General Area

Topock Marsh



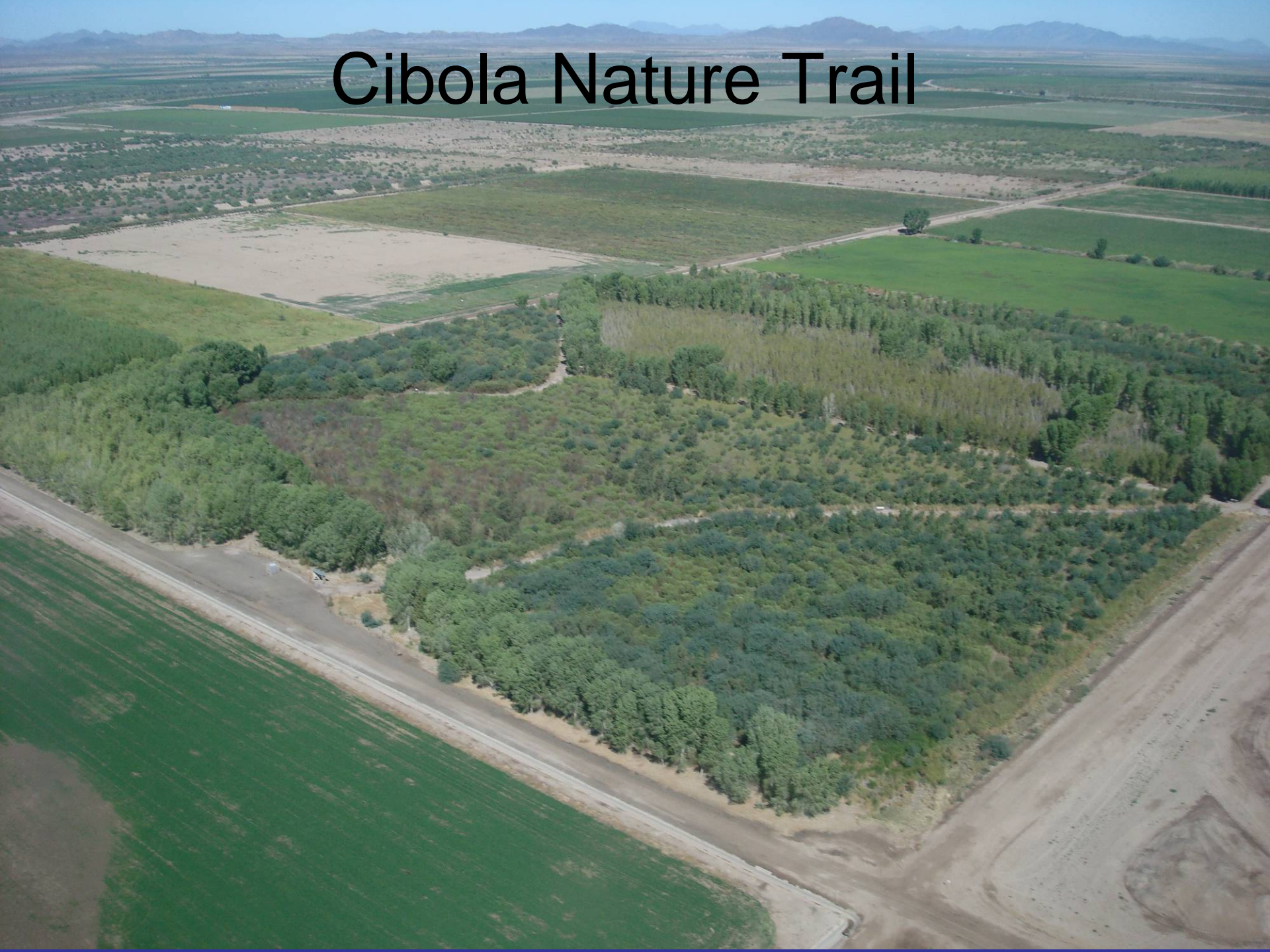
Beal Restoration Site



Sigmodon spp. captured at Beal



Cibola Nature Trail



Cibola Nature Trail, *Sigmodon* habitat. View from the trail.



General view. Mix of Johnson grass, *Baccharis* spp., and Mesquite



Closer view.



'Ahakhav Preserve



Pratt area



Habitat where *Sigmodon* spp. were captured in 2005



View of occupied *Phragmites* habitat at the Laguna Dam/ Mitry lake area.



Close up view



- Objectives

- Determine distributional extent along LCR

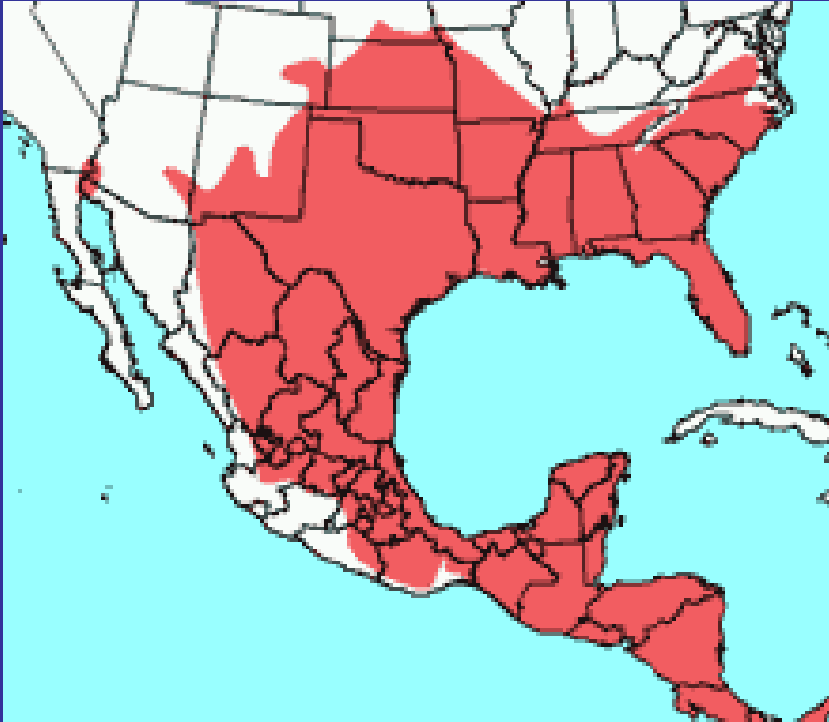
- Determine extent of population differentiation and dispersal along LCR and between LCR and the rest of the spp.



Ranges

S. hispidus

$2N = 52$



S. arizonae

$2N = 22-24$



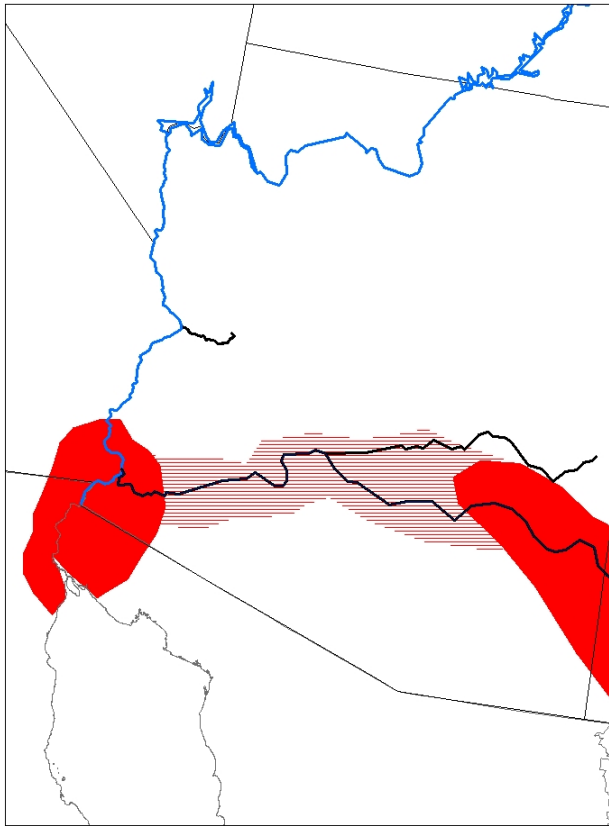
Along the LCR

- Population Differentiation
 - Use population parameters to qualitatively describe how different a locality is from the other localities
- Dispersal
 - Extent and direction of shared genetic information

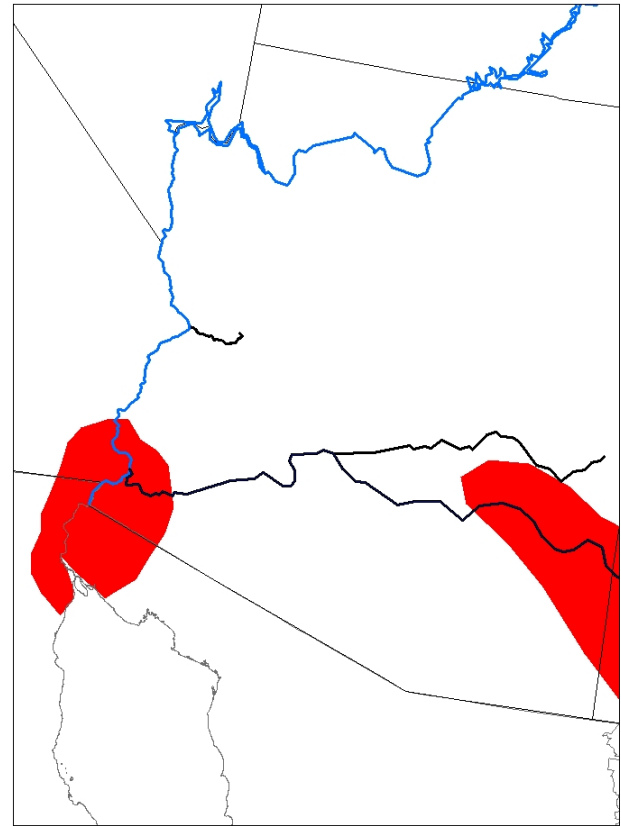
Between LCR and rest of species

- Pleistocene connection
 - During cooler/wetter periods the two disjunct ranges were once continuous
- Recent dispersal
 - Recent agricultural practices may allow for connectivity
 - “good years” may lead to population explosions
- Expectations:
 - >18,000ybp
 - Some genetic differentiation
 - Little to no dispersal
- Expectations:
 - <100ybp
 - No genetic differentiation
 - Some to considerable dispersal

Pleistocene Connection

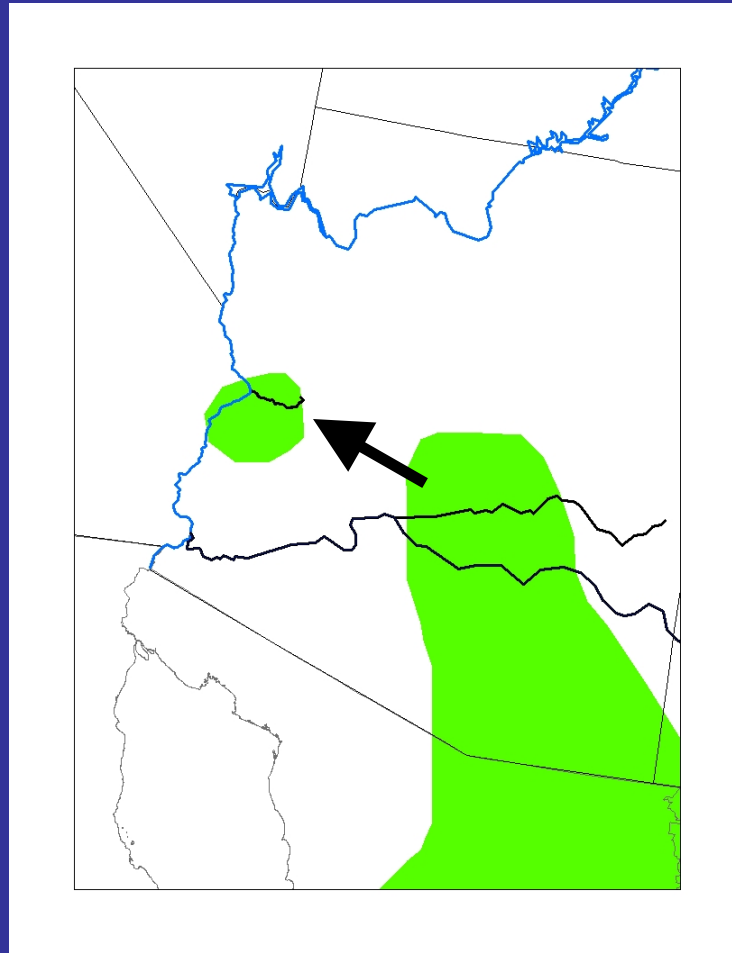


S. hispidus during LGM



S. hispidus today

Recent Dispersal



Directional dispersal of *S. arizonae* through agricultural matrix to Bill Williams River