

# Gartersnake Surveys in Central Arizona

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*Thamnophis rufipunctatus*  
(Narrow-headed Gartersnake)



*Thamnophis eques*  
(Mexican Gartersnake)

# Acknowledgments:

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## Background and Prior Studies

Both *T. eques* and *T. rufipunctatus* are restricted to AZ & NM in US.

Both species are highly aquatic and tied to riparian systems.

Rosen & Schwalbe (1988) estimated <10,000 of each species in AZ, with population declines evident.

Rosen & Wallace (2001) reported further declines of *T. eques* in SE AZ since 1980s.

Nowak & Santana-Bendix (2002) suggest population and range reductions of *T. rufipunctatus* in Oak Creek since 1980s.

*T. eques* petitioned for ESA listing in Dec 2003.

Take prohibited for both species in AZ starting in 2005.

*T. rufipunctatus*



*T. elegans*



*T. eques*



*T. marcianus*



*T. cyrtopsis*





# Distribution in Arizona



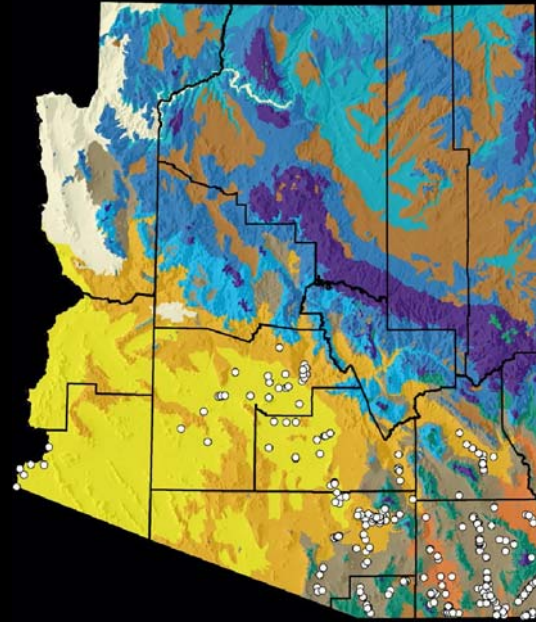
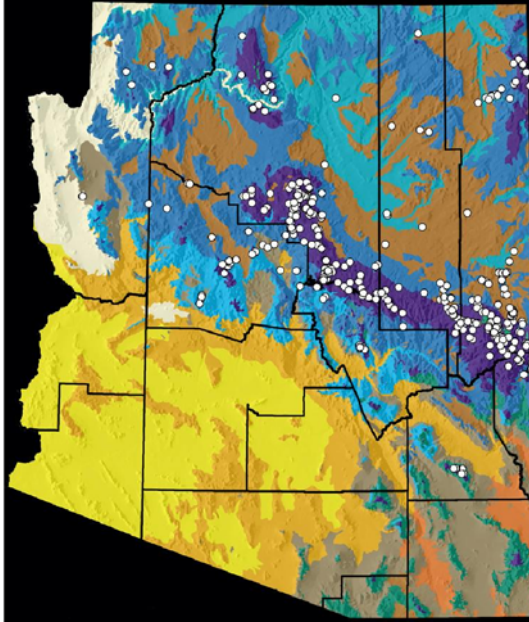
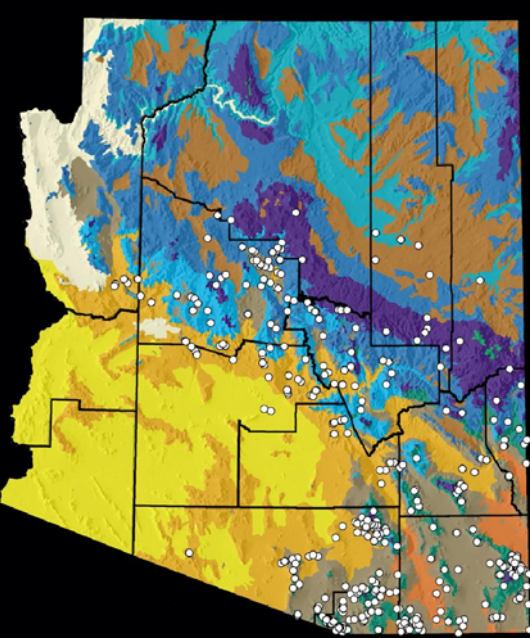
*cyrtopsis*



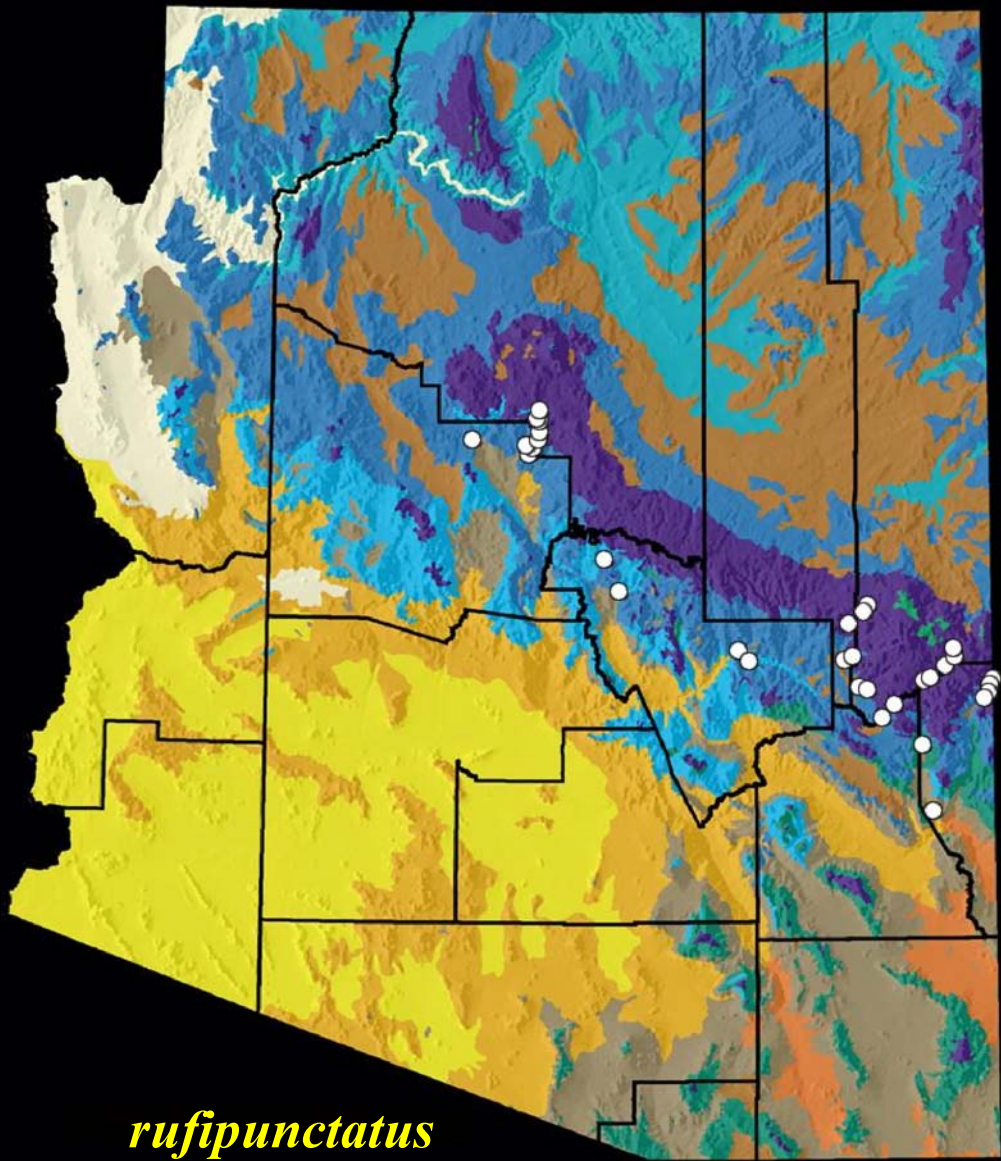
*elegans*



*marcianus*

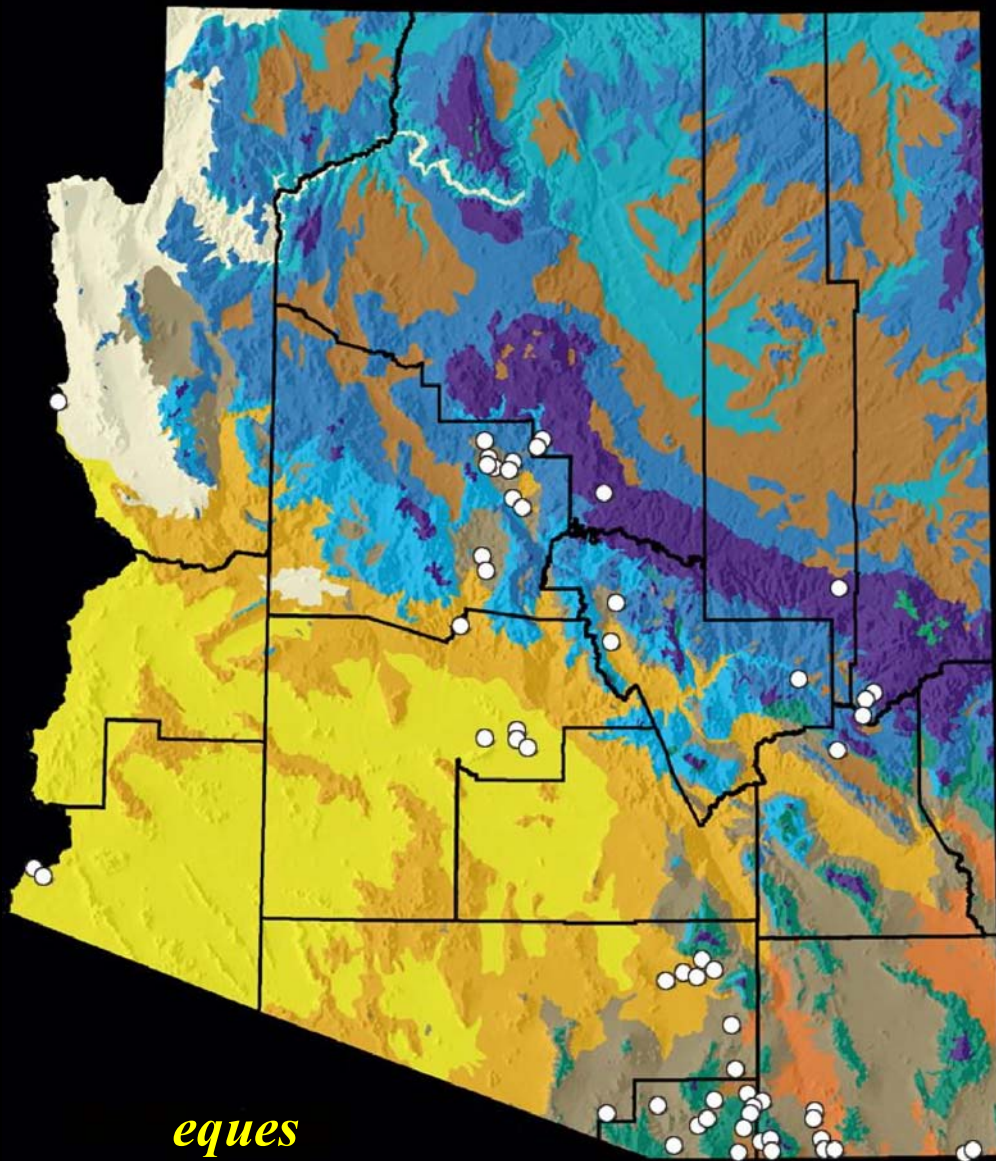






*rufipunctatus*

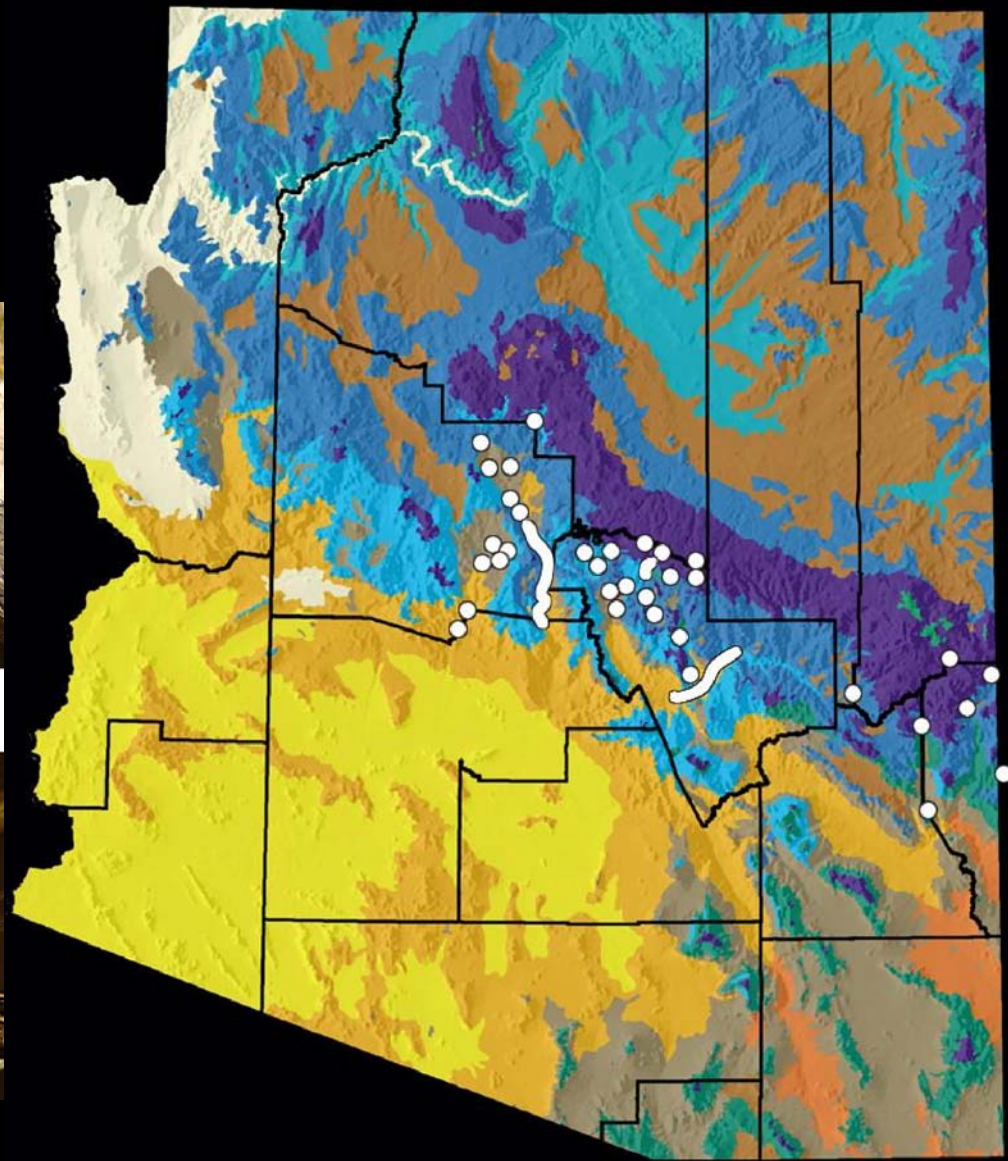




*eques*



# Sites Surveyed





# Field Methods

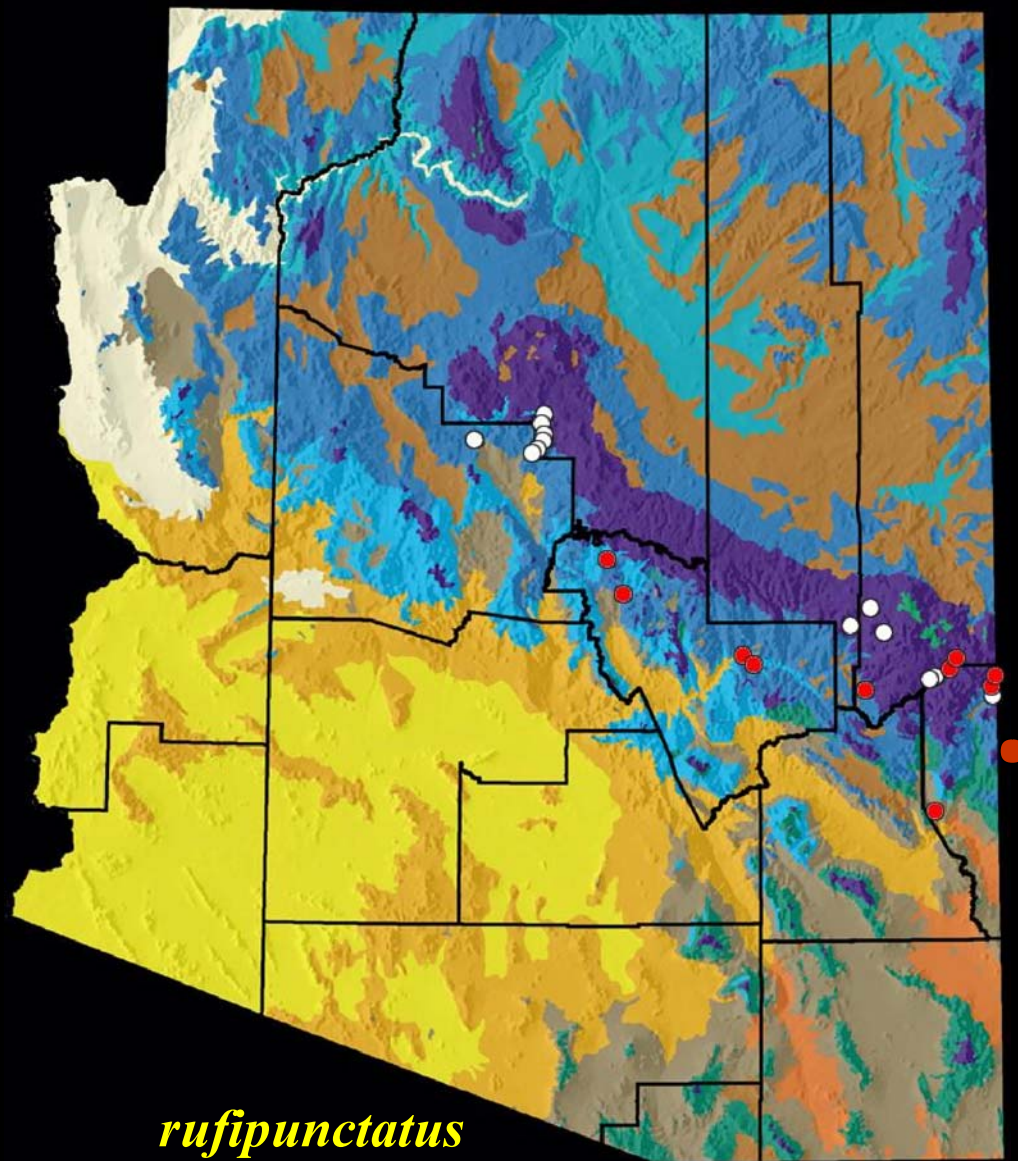
- Active searches
- Funnel Traps
- Gill nets & seines





## Post-1985 Records

(Red indicates sites surveyed in 2004, but with no *rufipunctatus* found)





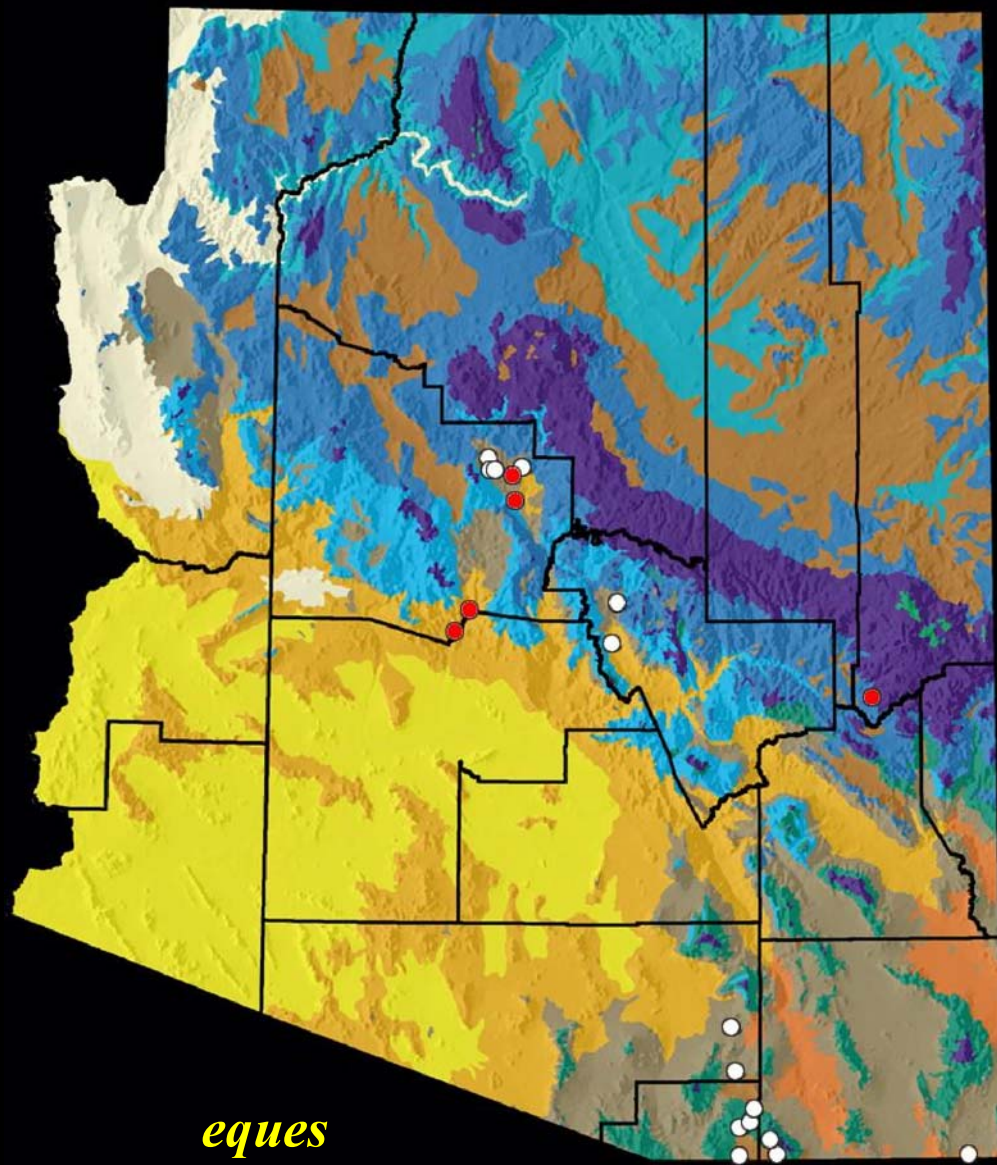
## ***T. rufipunctatus*: Known Localities Surveyed During this Study.**

<b>Location</b>	<b>Most Recent Prior Record</b>	<b>This study (2004)</b>	
		<b><i>T. rufipunctatus</i></b>	<b>Crayfish</b>
<b>Salt River Drainage</b>			
Salt River (Hwy 60 to Hwy 288) & lower Canyon Creek	1986		<b>Y</b>
Big Bonito Creek	1986		<b>Y</b>
East Fork Black River	1988		<b>Y</b>
Houston/Tonto Creek	1994		<b>Y</b>
<b>Verde River Drainage</b>			
East Verde River	1986		<b>Y</b>
Oak Creek	2004	<b>Y</b>	
<b>Gila River Drainage</b>			
Blue River	1998	<b>Y</b>	<b>Y</b>
Eagle Creek	1991		<b>Y</b>



## Post-1985 Records

(Red indicates sites surveyed in 2004, but with no *eques* found)





## **T. eques: Known Localities Surveyed During this Study.**

<b>Location</b>	<b>Most Recent Prior Record</b>	<b>This study (2004)</b>	
		<i>T. eques</i>	Crayfish
<b>Salt River Drainage</b>			
Big Bonito Creek	1986		Y
Tonto Creek	1995	Y	Y
<b>Verde River Drainage</b>			
Verde River (Camp Verde to Clarkdale)	2003	Y	Y
Oak Creek/Page Springs	1986	Y	In creek
Spring Creek	1986		Y
Sycamore Creek	1954		Y
<b>Agua Fria Drainage</b>			
Agua Fria R. @ Table Mesa Road	1986		Y
Agua Fria R. @ Rock Springs	1986		Y
Agua Fria River (Cordes Junction to Bloody Basin)	1981		Y
Little Ash Creek	1984		Y

# Crayfish

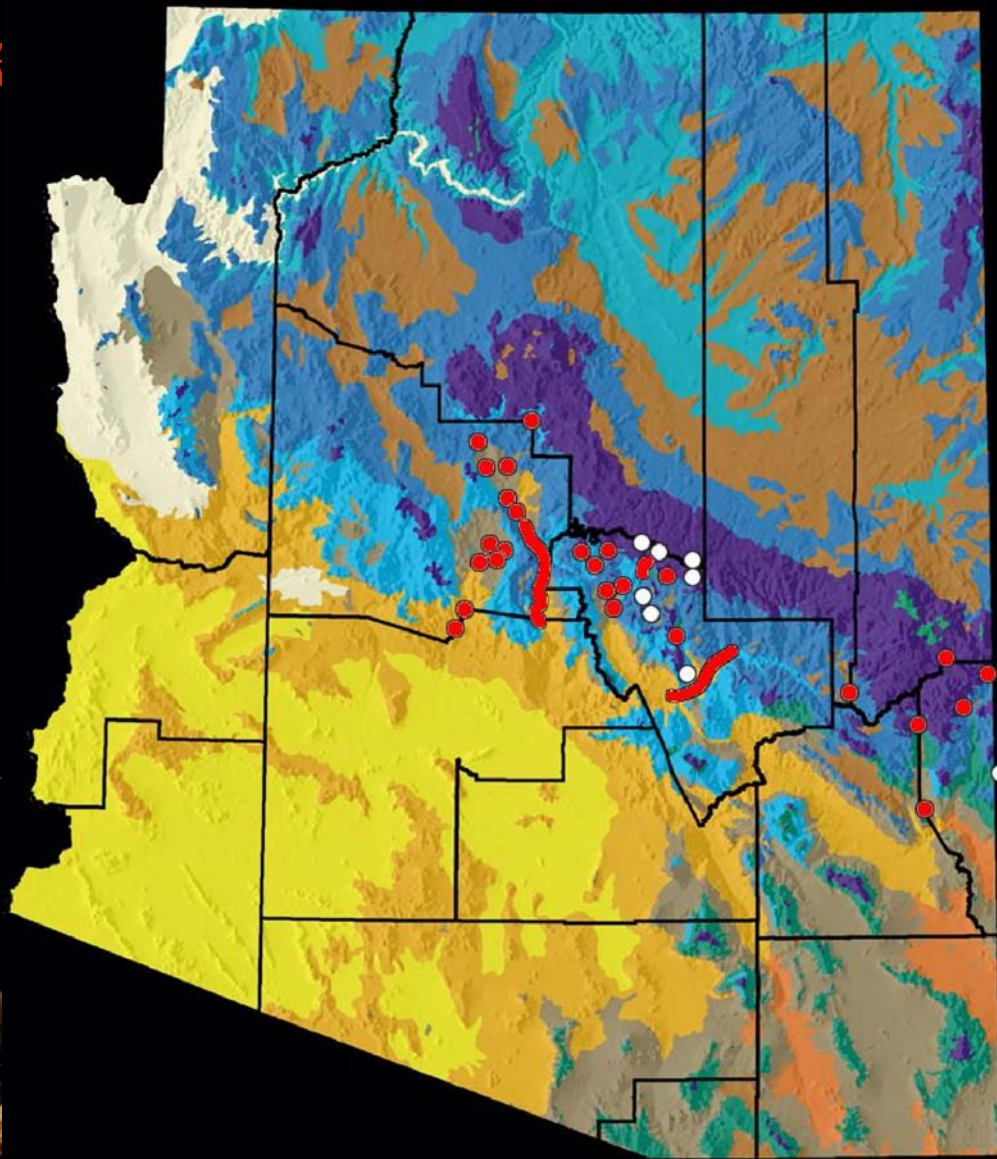
- We found crayfish at 24 of 30 sites we surveyed.
- Crayfish preyed on fish caught in traps and nets.
- Crayfish have been documented to kill & eat gartersnakes in lab and in the wild.





# 2004 Survey Sites

- Crayfish Absent
- Crayfish Present



# ***T. rufipunctatus* Captures at San Francisco River, NM 1995-1997 and 2004**

<b>Dates</b>	<b># Days</b>	<b># Traps</b>	<b># Caught</b>
<b>31 Aug 1995</b>	<b>1</b>	<b>0</b>	<b>14</b>
<b>11-15 Sep 1995</b>	<b>4</b>	<b>88</b>	<b>95</b>
<b>22-25 Sep 1995</b>	<b>4</b>	<b>77</b>	<b>43</b>
<b>2-5 May 1996</b>	<b>3</b>	<b>66</b>	<b>17</b>
<b>11-14 June 1996</b>	<b>3</b>	<b>73</b>	<b>21</b>
<b>12-16 Aug 1996</b>	<b>4</b>	<b>77</b>	<b>110</b>
<b>22-26 Sep 1996</b>	<b>4</b>	<b>~70</b>	<b>79</b>
<b>18-22 May 1997</b>	<b>4</b>	<b>76</b>	<b>61</b>
<b>21-25 June 1997</b>	<b>4</b>	<b>86</b>	<b>76</b>
<b>20-24 Oct 1997</b>	<b>4</b>	<b>84</b>	<b>13</b>
<b>27-29 April 2004</b>	<b>2</b>	<b>111</b>	<b>0!</b>
<b>2-3 Aug 2004</b>	<b>1</b>	<b>124</b>	<b>0!</b>



# Prevalence of exotic species in central Arizona streams

<b>Species or Group</b>	<b># Sites</b>
<b>Lowland leopard frog (<i>R. yavapaiensis</i>)</b>	<b>3</b>
<b>Chiricahua leopard frog (<i>R. chiricahuensis</i>)</b>	<b>1 (?)</b>
<b>Bullfrog (<i>R. catesbeiana</i>)</b>	<b>16</b>
<b>Native Fish only</b>	<b>3</b>
<b>Non-Native Fish only</b>	<b>16</b>
<b>Both Native &amp; Non-native Fish</b>	<b>14</b>

# Changes in Agua Fria frog populations since 1988

Location	Rosen & Schwalbe (1988)	This study (2004)
Agua Fria @ Table Mesa	<i>R. yavapaiensis</i>	<i>R. catesbeiana</i>
Agua Fria @ Rock Springs	<i>R. yavapaiensis</i>	<i>R. catesbeiana</i>
Agua Fria River (Cordes to Bloody Basin)	<i>R. yavapaiensis</i> <i>R. catesbeiana</i>	<i>R. catesbeiana</i>
Little Ash Creek	<i>R. yavapaiensis</i>	<i>R. catesbeiana</i>



- *T. rufipunctatus* appears to be in broad decline in the United States, and local populations may be extirpated
- *T. eques* survey results are inconclusive for assessing status of central Arizona populations
- Wholesale replacement of native aquatic species by exotic species in Mogollon Rim streams
- Crayfish --- #1 threat to Mogollon Rim streams?



# Voucher Photographs Needed!

- Vouchers deposited in public institutions provide permanent and **verifiable** documentation of species' spatial and temporal distribution
- Sightings are neither verifiable nor dependable
- Photograph the head and forebody from the side... be sure the side stripe shows!
- Send images (along with specific locality, date, and photographers name) to :

**Arizona State University Photo Voucher Collection**  
c/o **holycross@asu.edu**



Photo ©2003 Tom Brennan

