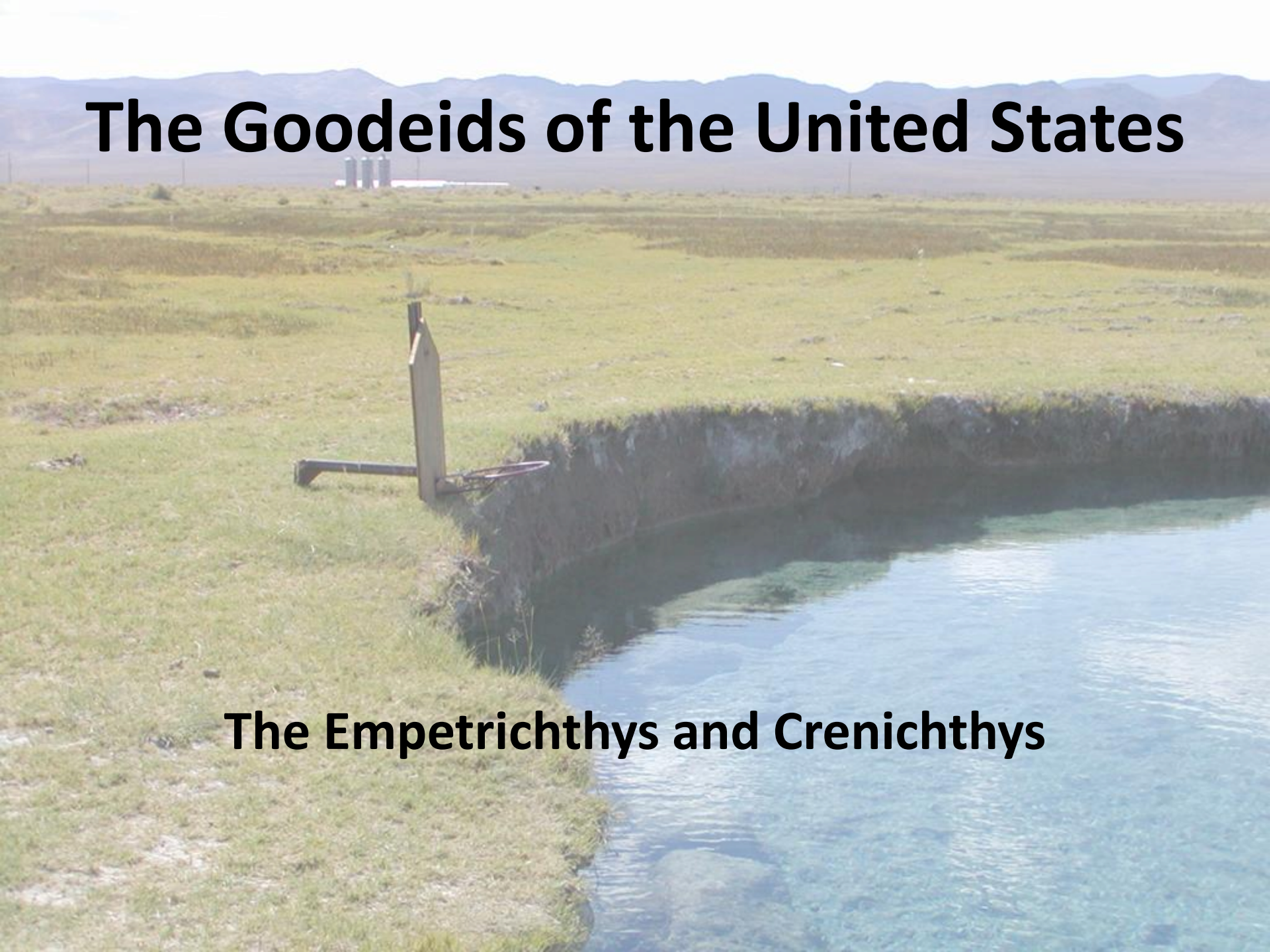


The Goodeids of the United States

The Empetrichthys and Crenichthys



Similarities

- Global problems
- Similarities in Management
- Communication



CONSERVACIÓN DE STOCKS GENÉTICO DE *Aphanius iberus* (MURCIA)

LIFE04/NAT/ES/000035



CURSOS LIFE-FARTET
FASE DIVULGACIÓN



Región de Murcia
Consejería de Industria y Medio
Ambiente
Dirección General del Medio Natural



Museo de la Ciencia y el Agua

09/28/2012

- Crenichthys – Springfish



- Empetrichthys - Poolfish



Nevada Rivers

- ~500 Km wide



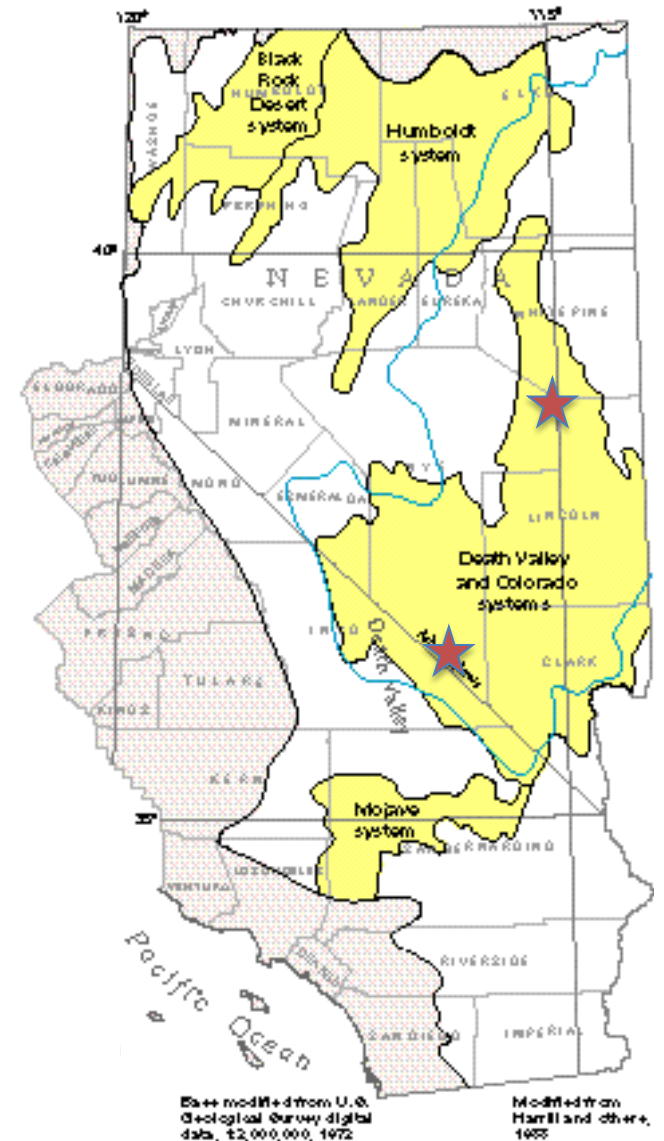
0 100 KM 100 Miles

© geology.com

Extensive Carbonate Aquifer



Photo: USGS-BRD



Drying and divergence

- Pleistocene lakes and tectonics
- Desertification

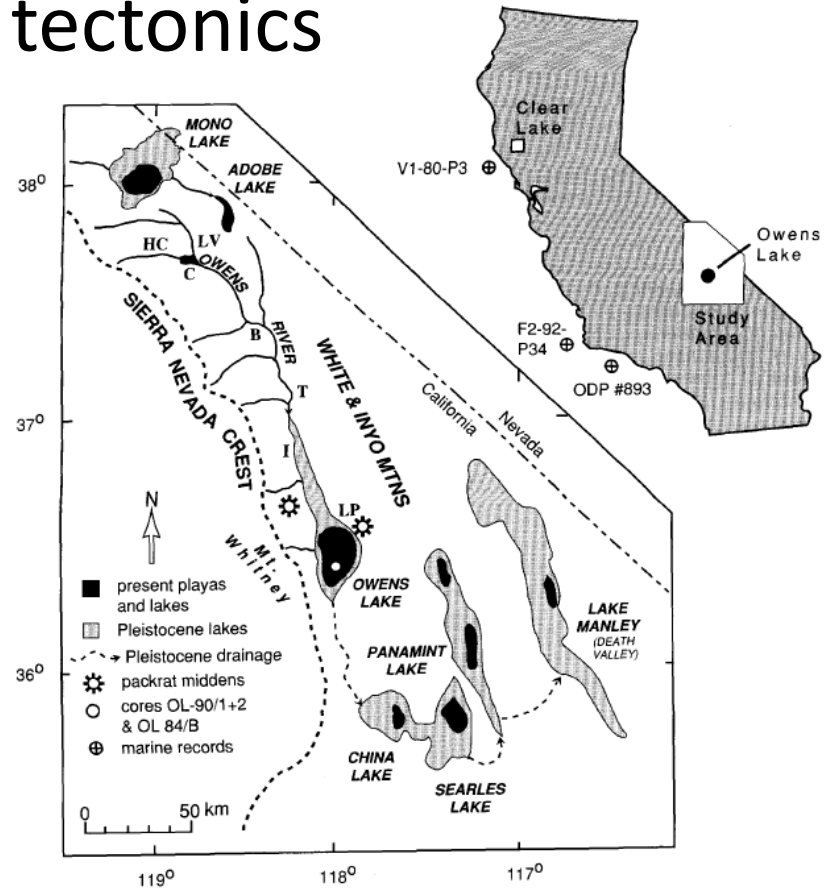


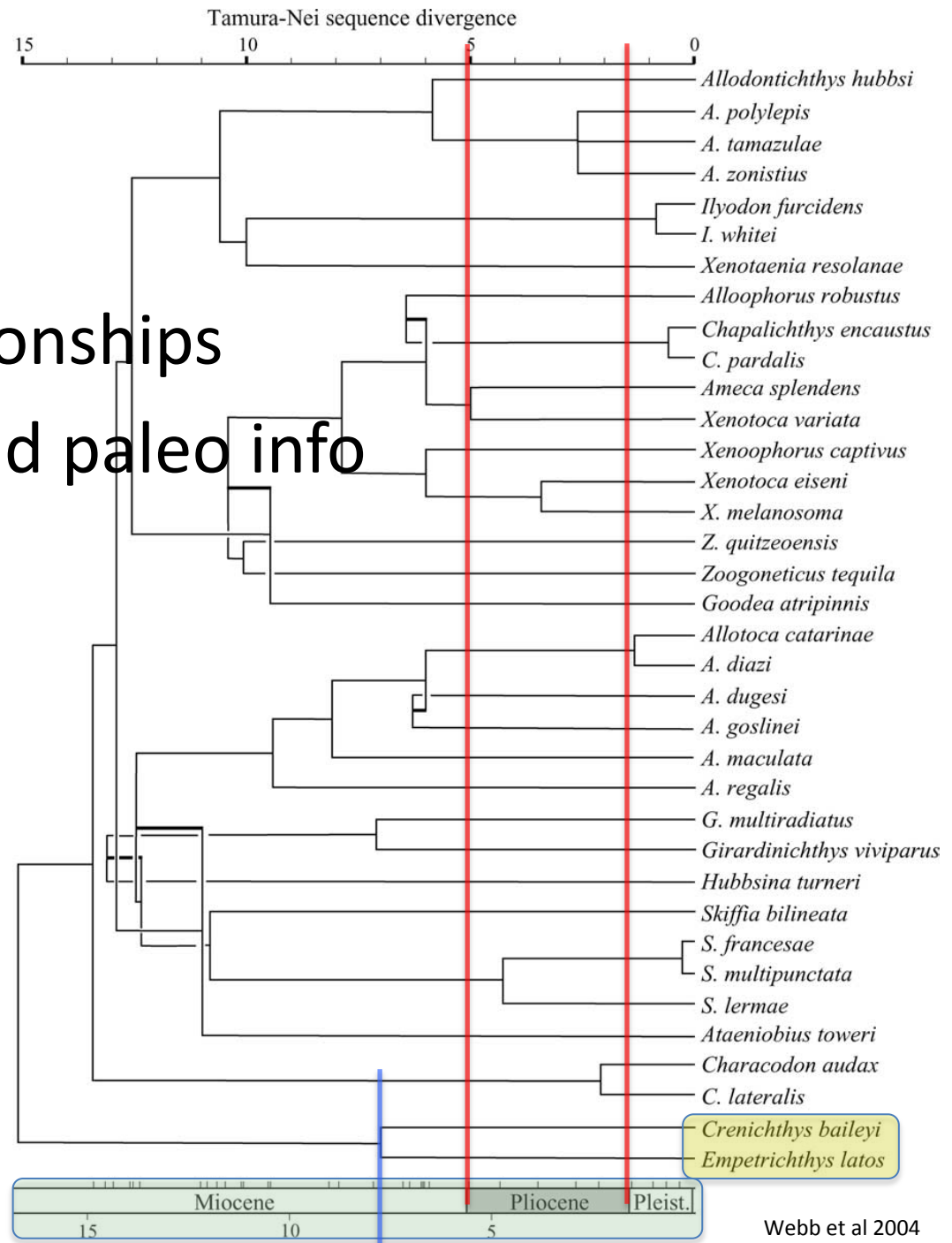
FIGURE 1.—Index map showing Owens Lake and Owens River drainage system in southeastern California and locations of marine cores along the California margin. B = Bishop, C = Crowley Reservoir, HC = Hot Creek, I = Independence, LP = Lone Pine, LV = Long Valley, T = Tinemaha.

Water Use and Disturbance

- Potential to further diminish habitat



- Phylogeny – relationships
- When diverged and paleo info



Differences of US Goodieds

- Empetrichthinae
 - Egg layers, no pelvic fins, no split anal fin
 - Closest to *Characodon*



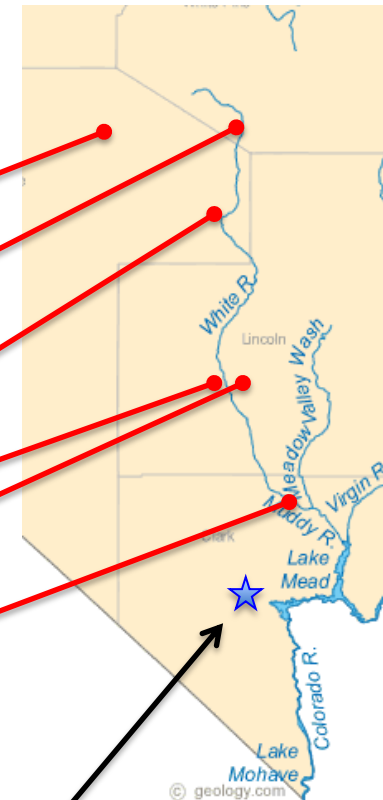
Zoogoneticus quitzeoensis



PAHRUMP POOLFISH
Empetrichthys latos

Crenichthys

- 2 species (nevadae and baileyi)
- 5 subspecies
 - Morphometrics and genetics
 - Connectivity
 - Crenichthys nevadae
 - Crenichthys baileyi albivallis
 - Crenichthys baileyi thermophilus
 - Crenichthys baileyi grandis
 - Crenichthys baileyi baileyi
 - Crenichthys baileyi moapae



Las Vegas, NV

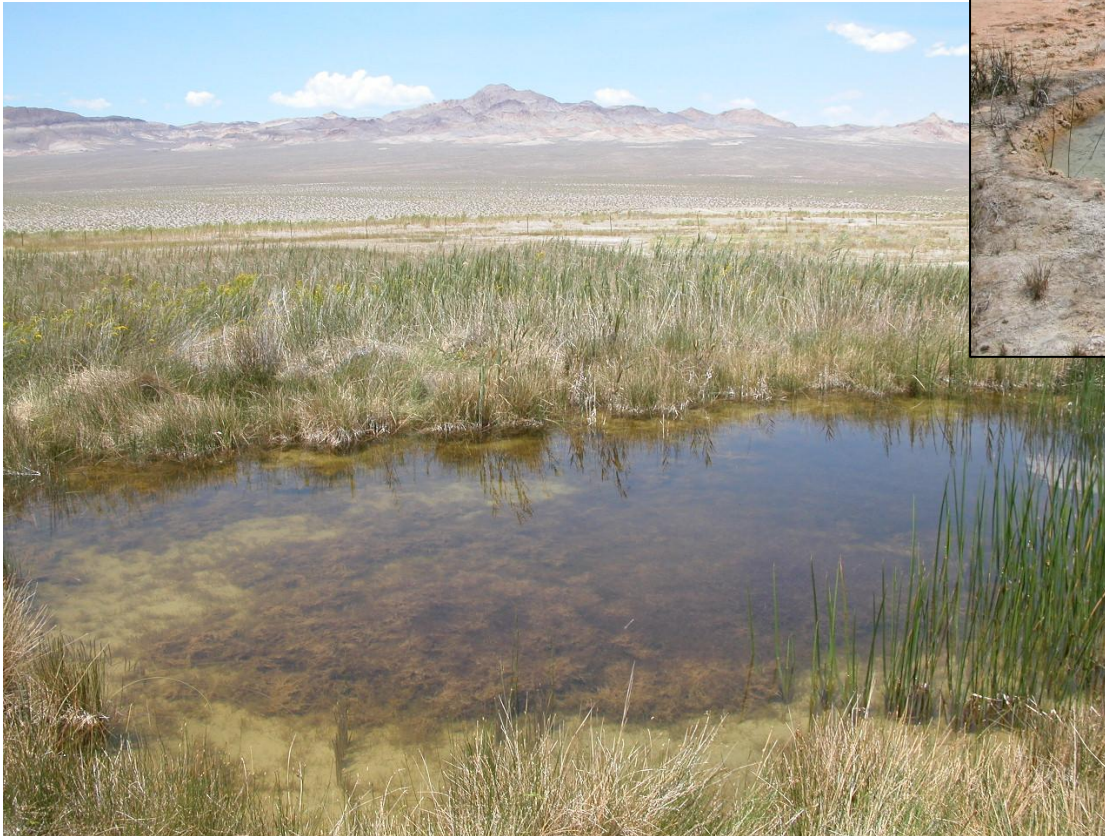
Railroad Valley Springfish

- *Crenichthys nevadae*



Railroad Valley Springfish

- Habitat



Preston White River Springfish

- *Crenichthys baileyi albivallis*



Moorman Springs Springfish

- *Crenichthys baileyi thermophilus*



Hiko White River Springfish

- *Crenichthys baileyi grandis*



Hiko White River Springfish

- Habitats – Blue Link Spring and Crystal Spring



White River Springfish

- *Crenichthys baileyi baileyi*



Moapa White River Springfish

- *Crenichthys baileyi moapae*

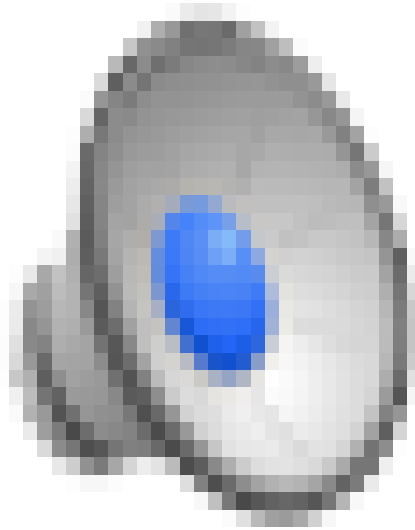


Stream Viewing Chamber



Moapa White River Springfish

- *Crenichthys baileyi moapae*



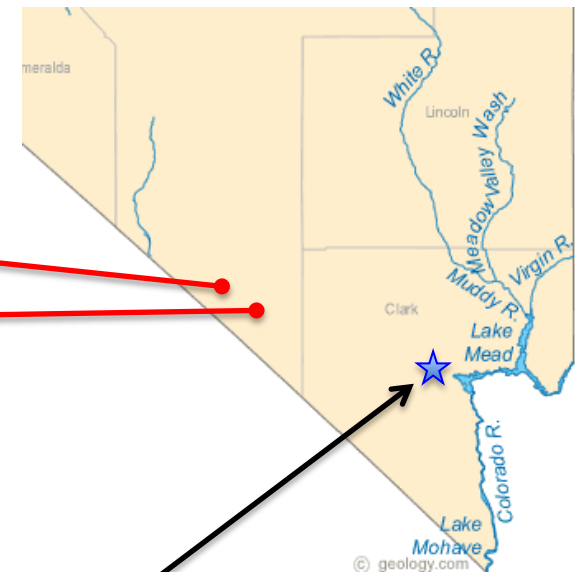
Empetrichthys



Empetrichthys

- Two Species (One extinct)
- 3 Subspecies (Two extinct)

- *Empetrichthys merriami*
- *Empetrichthys latos*



Las Vegas, NV

Historic Poolfish Distribution

Ash Meadows NWR

Pahrump, NV

manse

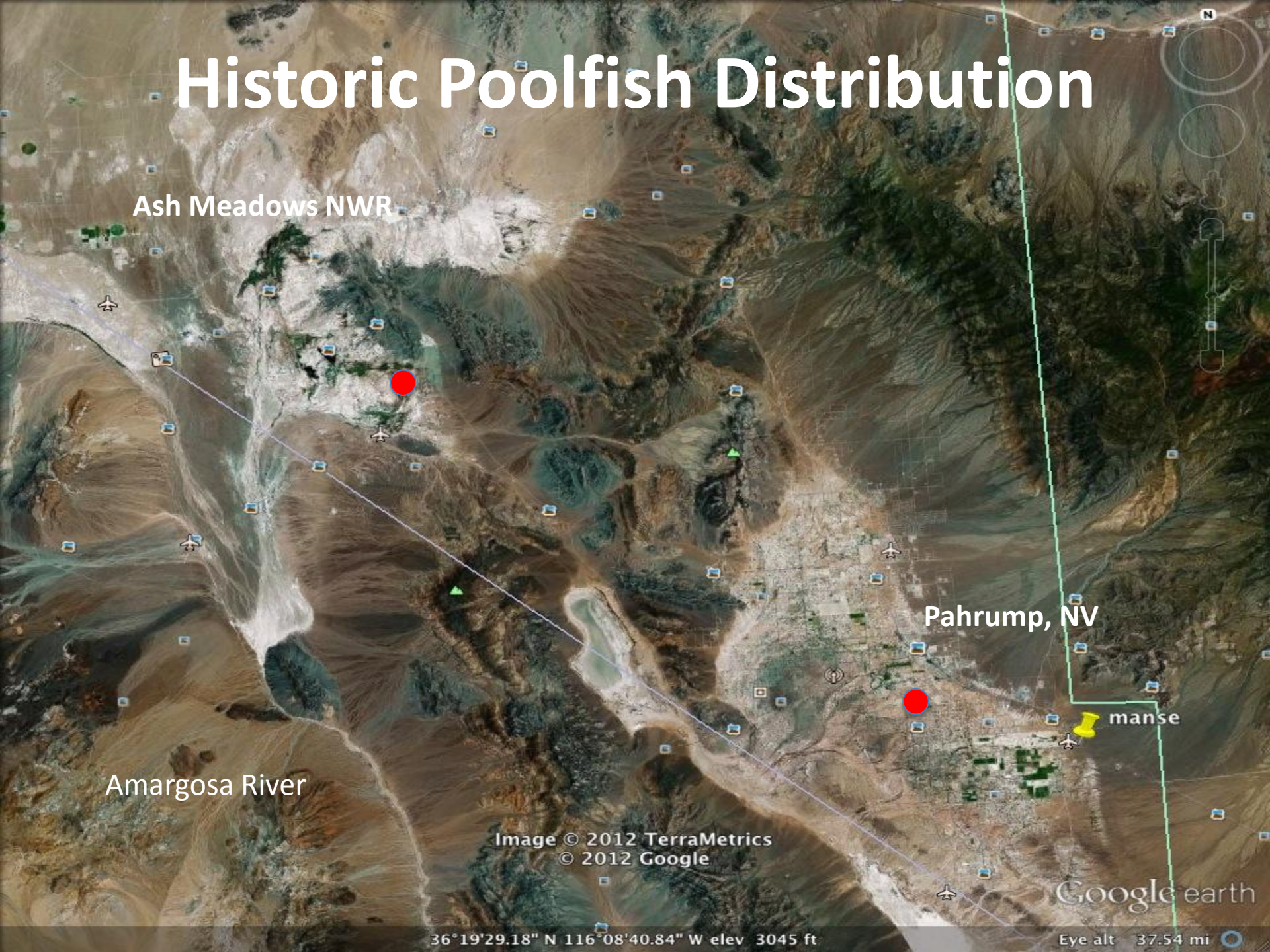
Amargosa River

Image © 2012 TerraMetrics
© 2012 Google

Google earth

36°19'29.18" N 116°08'40.84" W elev 3045 ft

Eye alt 37.54 mi



Historic Poolfish Distribution

Ash Meadows NWR

Pahrump, NV

manse

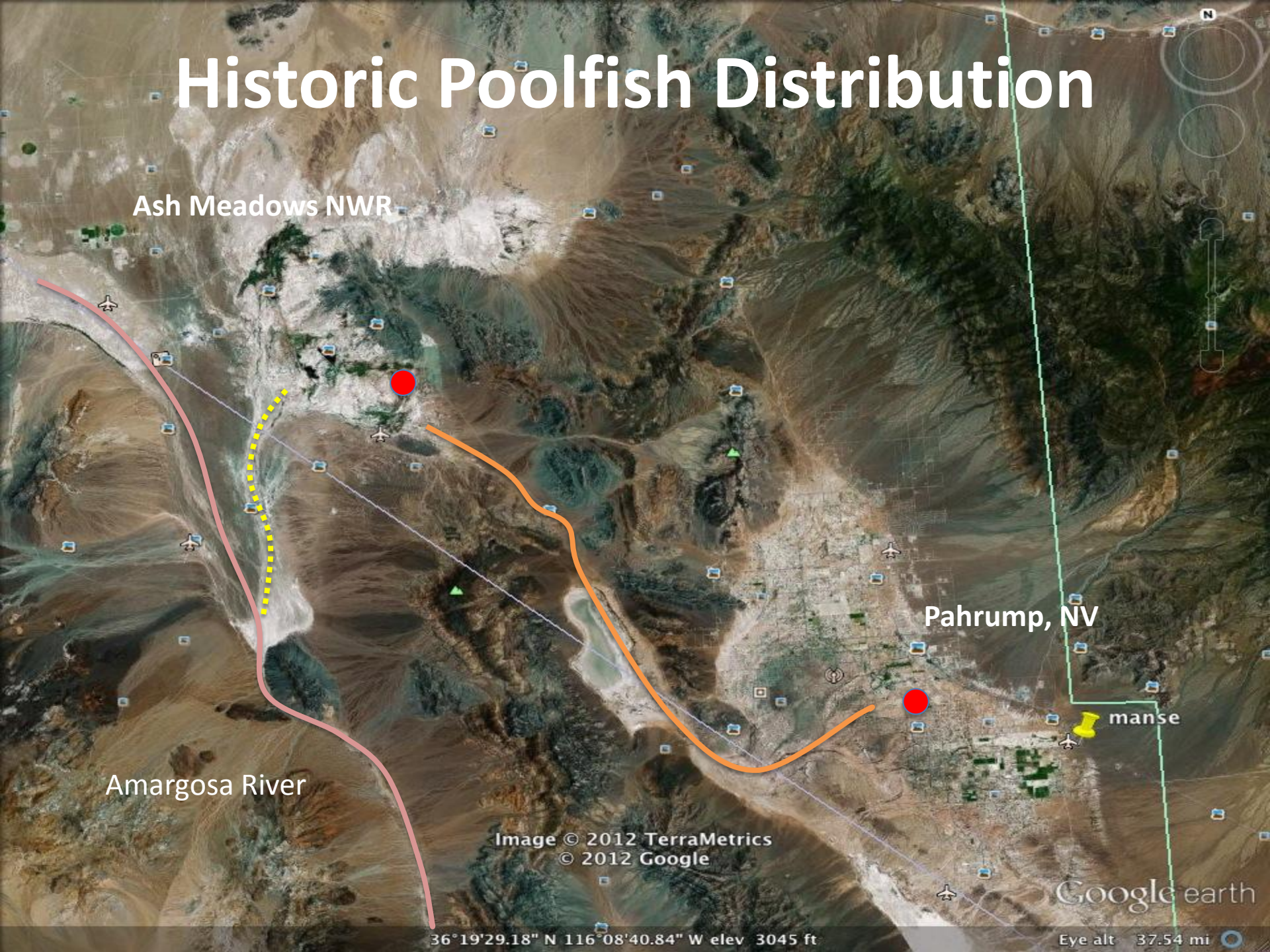
Amargosa River

Image © 2012 TerraMetrics
© 2012 Google

Google earth

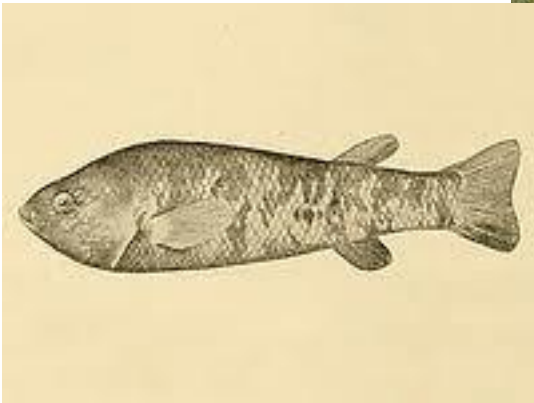
36°19'29.18" N 116°08'40.84" W elev 3045 ft

Eye alt 37.54 mi



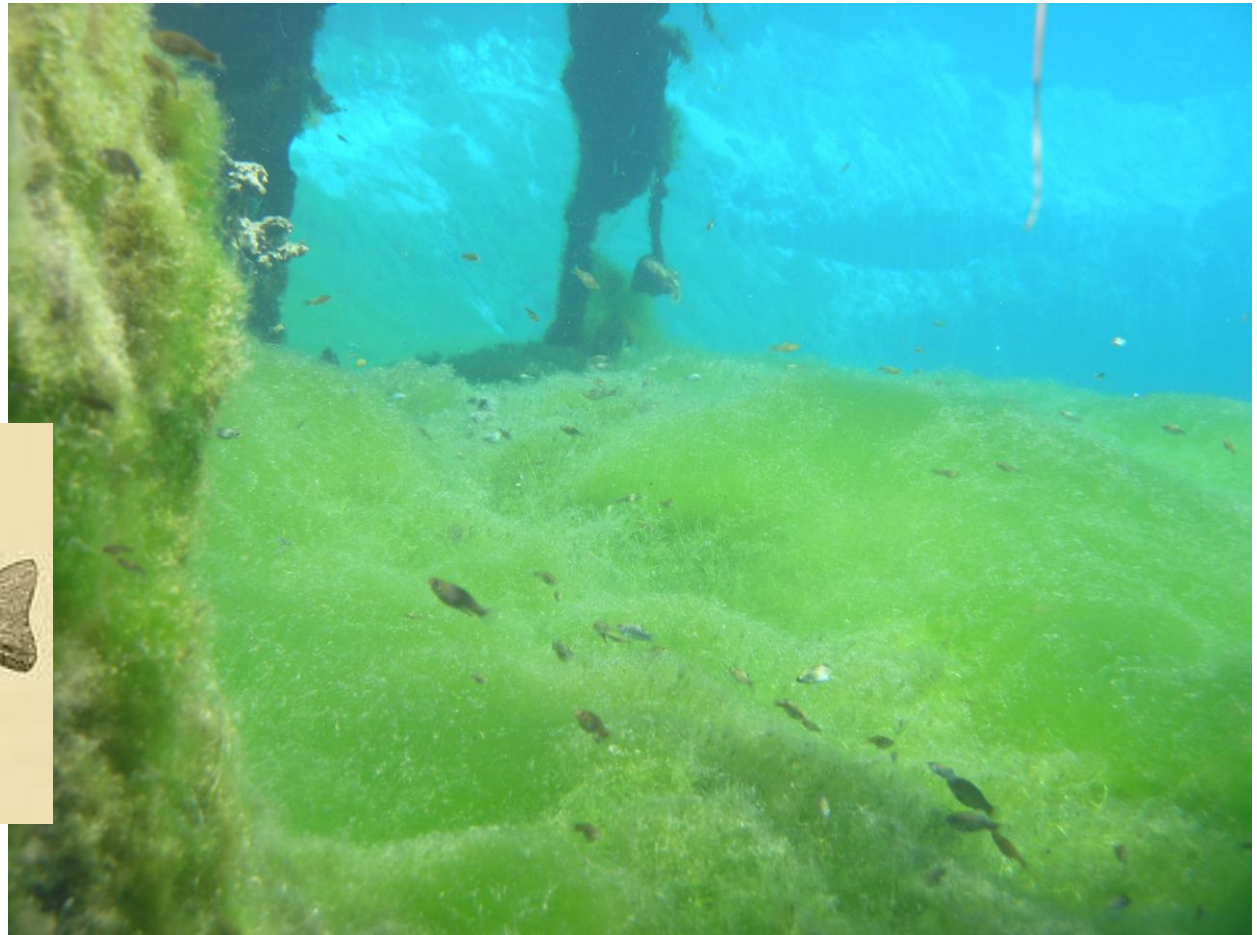
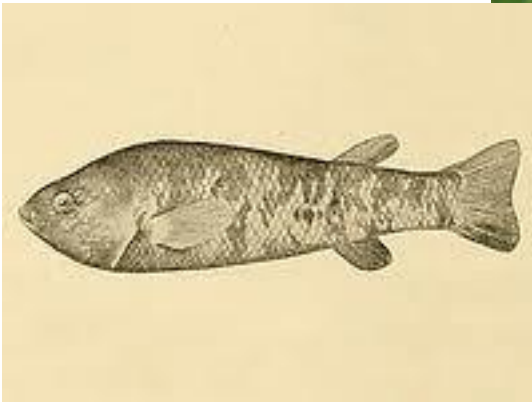
Empetrichthys merriami

- Occurred in Big Spring, Ash Meadows
- Extinct



Empetrichthys merriami

- Niche Overlap – Mollies and Pupfish



Empetrichthys latos latos

- Occurred in Manse Spring, Pahrump, Nevada

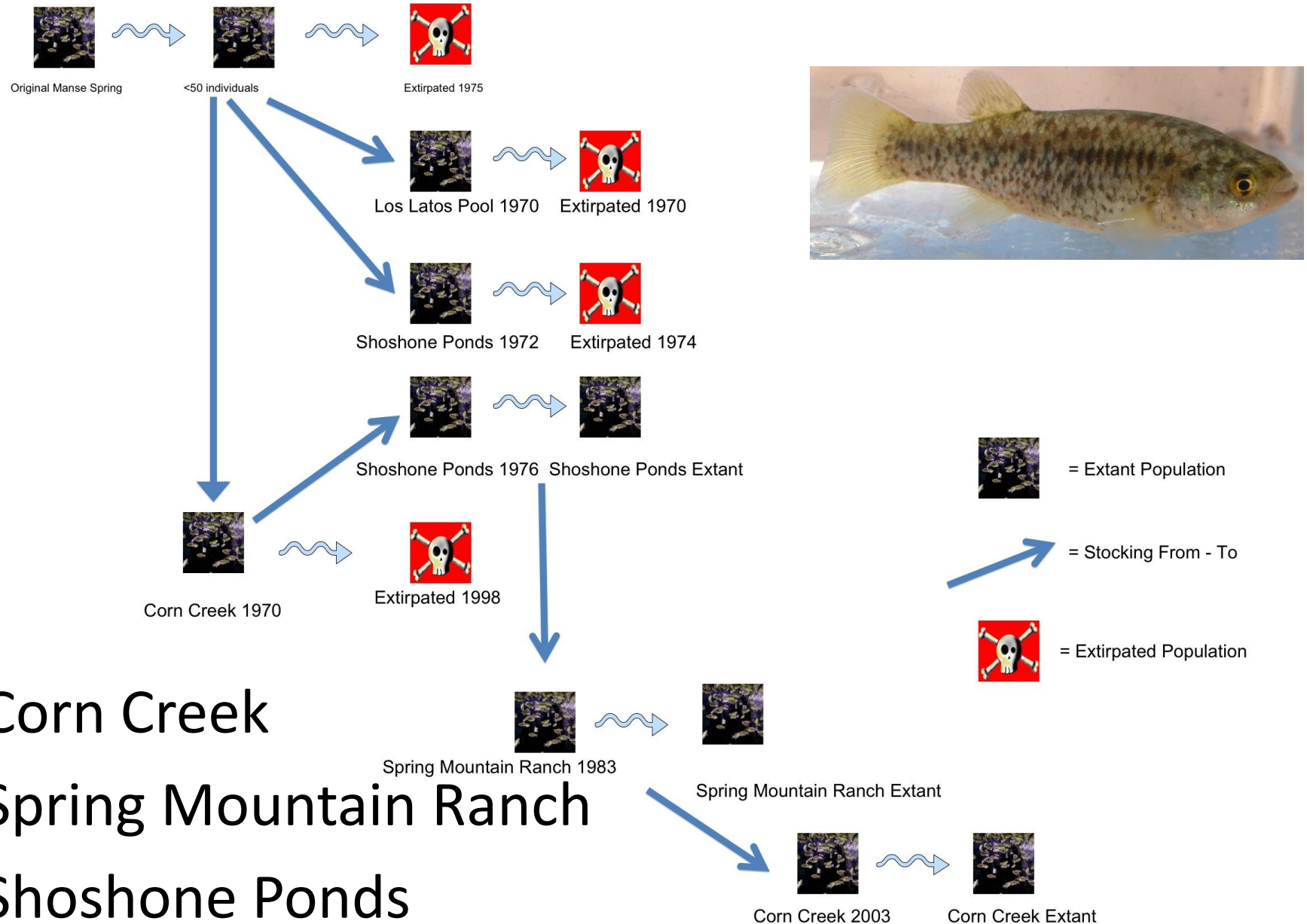


Deacon, 1964



1942, Robert R. Miller

Empetrichthys latos



- Corn Creek
- Spring Mountain Ranch
- Shoshone Ponds

E. latos – Spring Mountain Ranch

- One large lake, a dammed spring
- > 15,000 individuals



E. latos – Corn Creek

- Extirpated by crayfish
- Built a 2-chambered tank
- <100 individuals

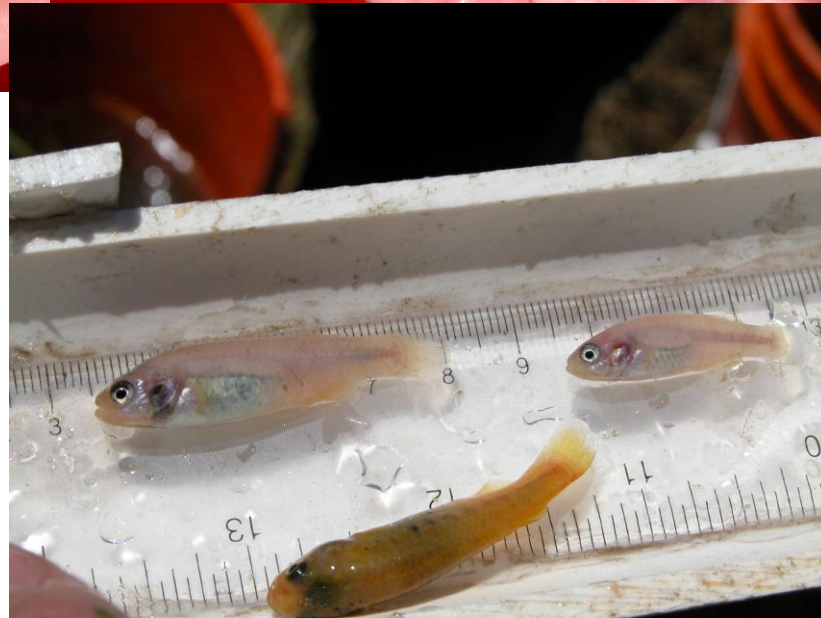


E. latos – Shoshone Ponds

- Three existing and one extirpated populations
- Approximately 6000 individuals



Abnormal Coloration



Other Native Species - Prehistoric



Other Native Species - Modern



Management

- Alien Species Removal
- Habitat Restoration
- Refuges



Alien Species



Physical Removal



Habitat manipulation



Rotenone



Habitat Restoration



Habitat Restoration



Habitat Restoration



Thank You

