

# Status update on the Endangered Moapa Dace (*Moapa coriacea*)



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# White River Flow System

- Eastern Nevada is drained by a small and discontinuous 200 mile long river
- Flowed during the Pleistocene but now mostly dry with subsurface flow
- Several endemic species are found in remnant springs, streams, and lakes
- The Muddy River begins at Warm Springs and flows into Lake Mead



# Aquatic Species of Concern in the Warm Springs Area

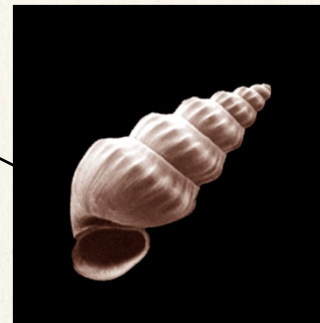
- Endemics

- Moapa dace (*Moapa coriacea*)
- Moapa White River springfish (*Crenichthys baileyi moapae*)
- Moapa naucorid (*Limnocoris moapensis*)
- Moapa riffle beetle (*Microcyllloepus moapus*)
- Moapa warm springs riffle beetle (*Stenelmis moapa*)
- Moapa pebblesnail (*Pyrgulopsis avernalis*)



- Rare non-endemics

- Moapa valley pyrg (*Pyrgolopsis carinifera*)
- Grated tryonia (*Tryonia clathrata*)
- Western naucorid (*Ambrysus mormon*)
- Pahrnagat naucorid (*Pelocoris biimpressus shoshone*)



# Warm Springs Natural Area

- Purchased in 2007 by SNWA, funded by the Southern Nevada Public Land Management Act (SNPLMA) Parks, Trails and Natural Areas Program
- WSNA acquired to protect and recover the Moapa dace while allowing regional groundwater development to proceed

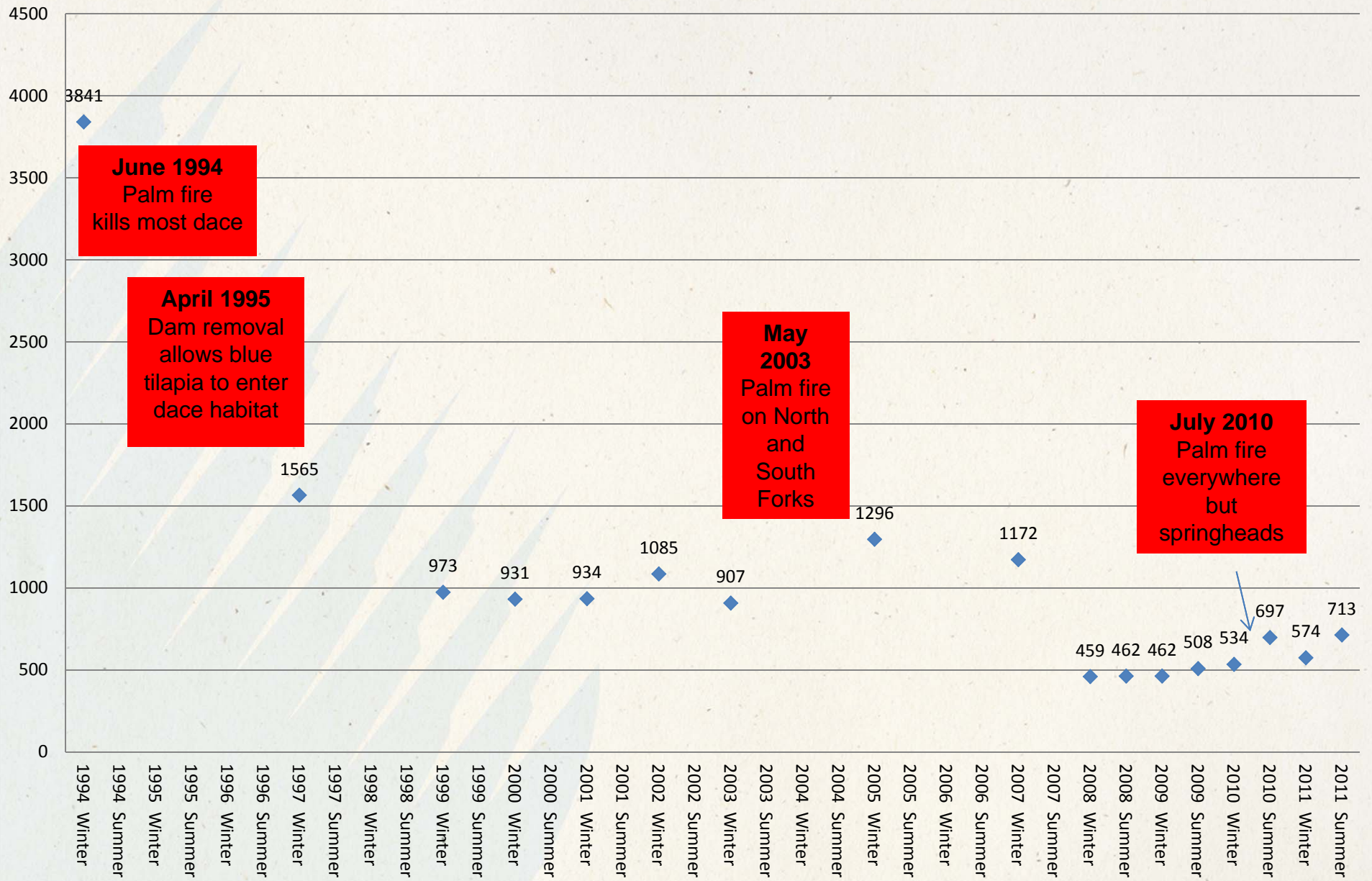


# Threats to the Moapa Dace

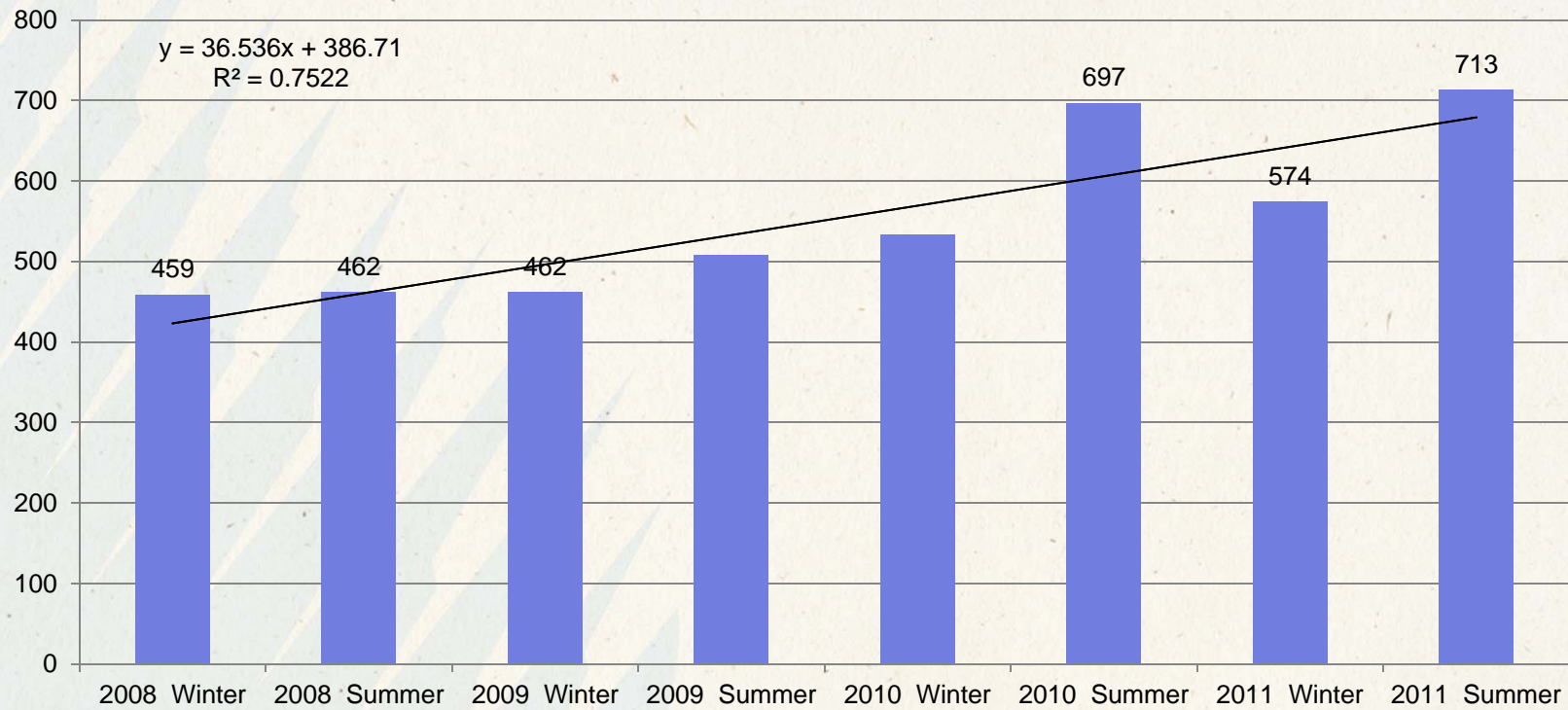
- Invasive species
  - California palms (*Washingtonia filifera*)
  - Western mosquitofish (*Gambusia affinis*) introduced before 1938
  - Shortfin mollies (*Poecilia mexicana*) introduced 1963
  - Blue tilapia (*Oreochromis aureus*) introduced about 1995
- Water development
  - Irrigation diversions
  - Groundwater development
- Habitat changes
  - Entrenchment/headcutting
  - Cooling due to ponding/sheetflow/coldwater inflows



# Moapa Dace Population 1994-2011



## Moapa Dace Snorkel Counts 2008-2011

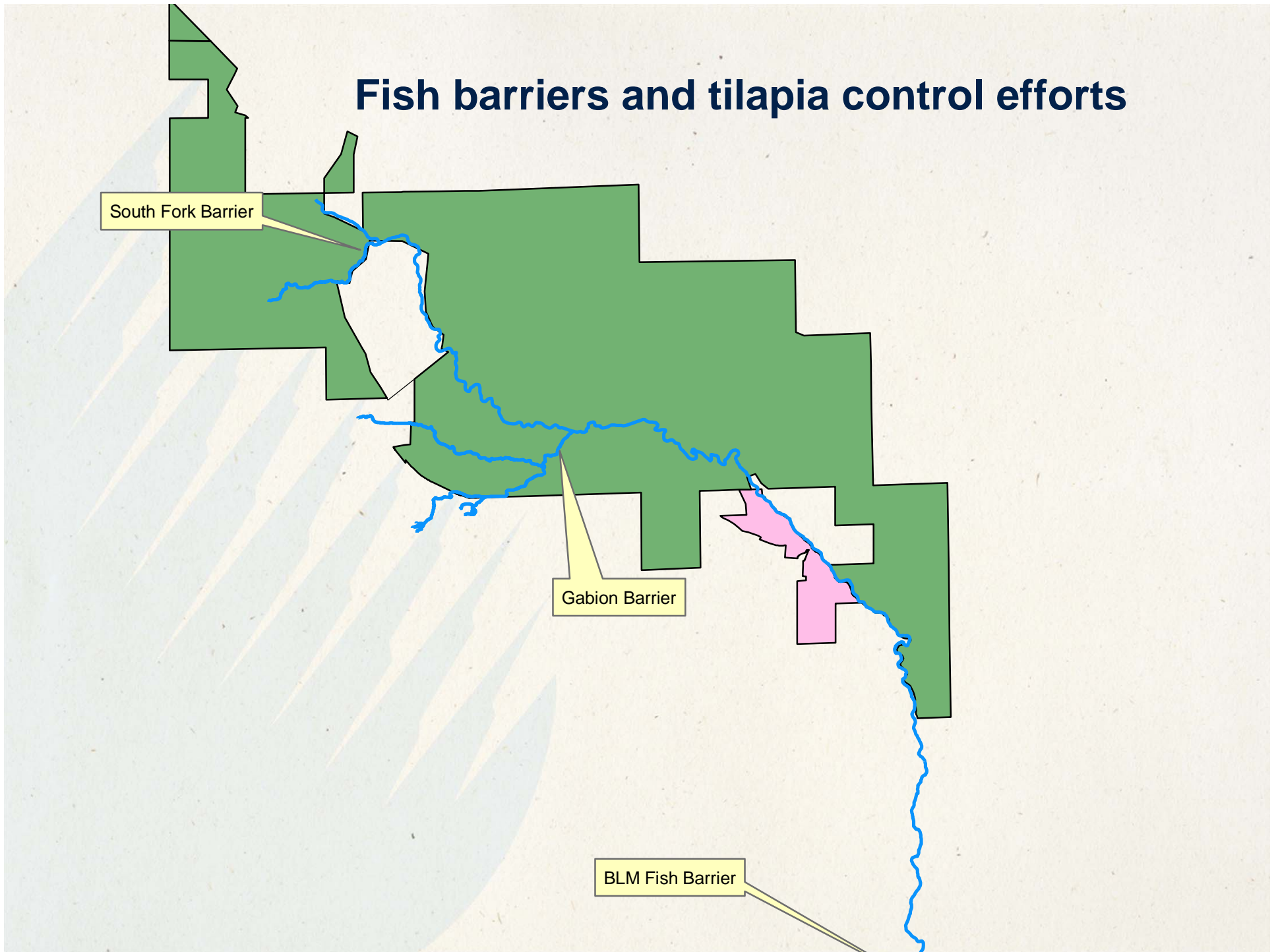


# Fish barriers and tilapia control efforts

South Fork Barrier

Gabion Barrier

BLM Fish Barrier





# Warm Springs Fire July 1, 2010



# Warm Springs Fire July 1 2010



## Cause of 2010 Fire

- SNWA contracted workers to trim palms and reduce fuel load
- Clark County Fire Department investigation reported that contractor's truck started fire

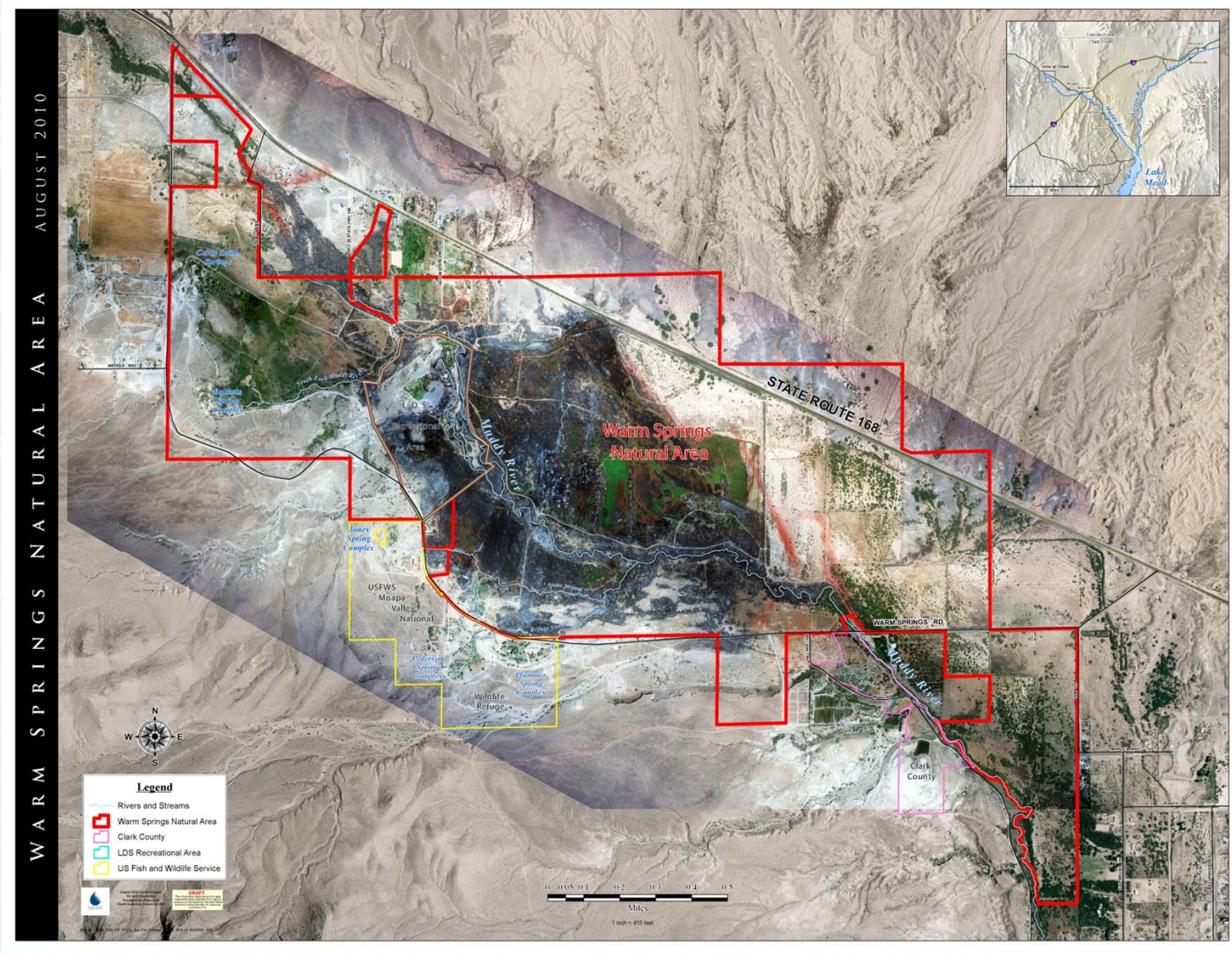


## Fire facts

- Fire burned with highest intensity in dense palm groves
- Native vegetation burned less intensely
- 601 acres burned
- One home burned
- LDS staffing quarters
- Declared out 7/7/10



# Aerial View of Area After Fire



## Lemonade from lemons? Unexpected benefits of the fire



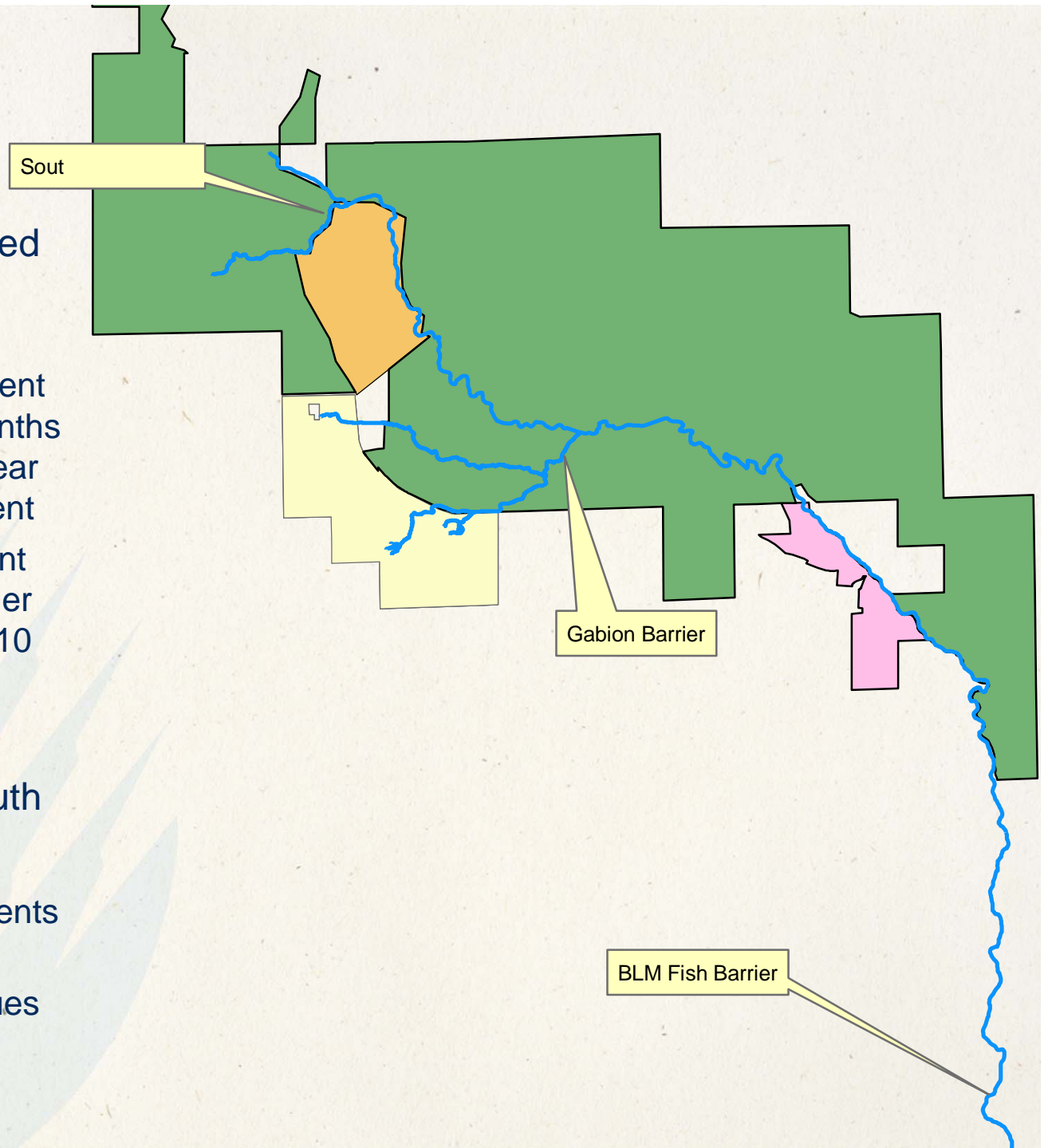
## Benefits of the fire

- Easier snorkeling for August dace counts!
- Dace numbers in August 2010 = 697
  - Increase from February 2010 (534)
- Increased aquatic invertebrates
- Increased recruitment



## Benefits of fire

- Loss of vegetation along streams allowed for easy access rotenone treatment
  - South Fork treatment in 2009 took 5 months of hard labor to clear access for treatment
  - Rotenone treatment down to BLM barrier completed Fall 2010
- Tilapia Found in South Fork Summer 2011
  - 4 rotenone treatments in Fall 2011
  - Monitoring continues





## Next Steps

- Continue efforts to remove tilapia and other invasive species
  - Once tilapia are eliminated, remove fish barriers to restore connectivity
  - Install removable barriers that can be inserted if other invasive fish are found
- Continue Moapa dace population monitoring
- Continue habitat restoration
- Recover the dace!



# Apcar Restoration



# Apcar Restoration



# Apcar Restoration



# Apcar Restoration



# Acknowledgements

- Moapa Dace Biological Action Committee
  - US Fish and Wildlife Service
  - US Geological Survey
  - Nevada Department of Wildlife
  - Coyote Springs Investment
  - Moapa Band of Paiutes
  - NVEnergy
  - Clark County
  - The Nature Conservancy
- And special thanks to the firefighters who saved our neighbor's homes and our office:
  - Clark County Fire Department
  - US Forest Service
  - National Park Service
  - Nevada Division of Forestry
  - US Fish and Wildlife Service
  - Bureau of Land Management



**Questions?**

