Desert National Wildlife Refuge Complex

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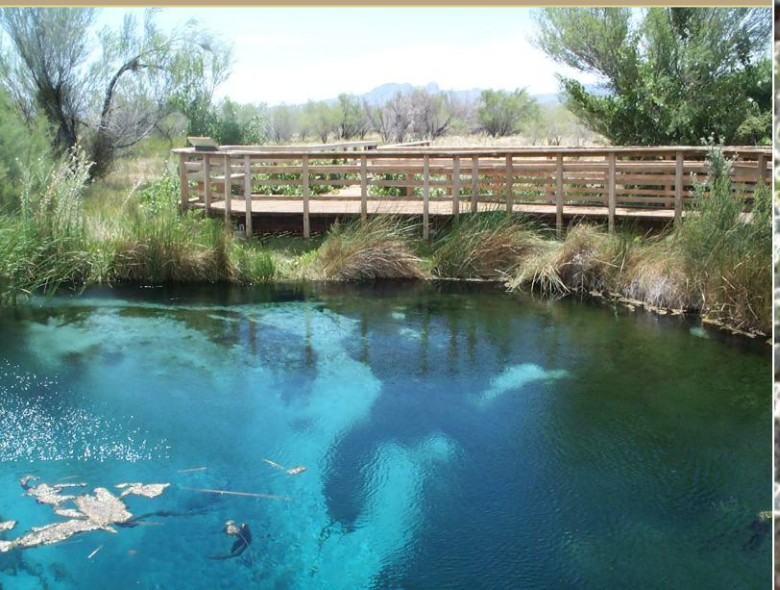
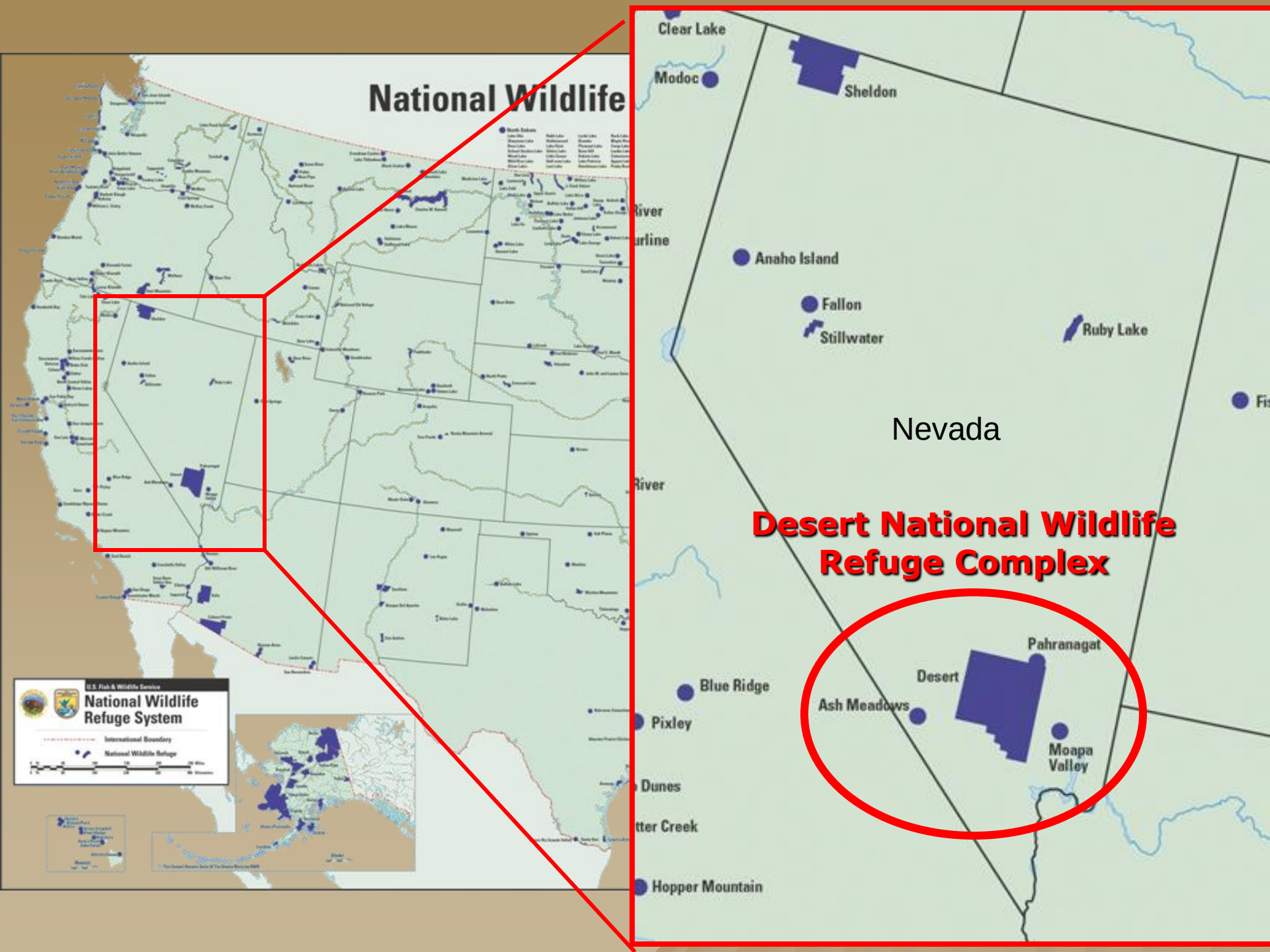
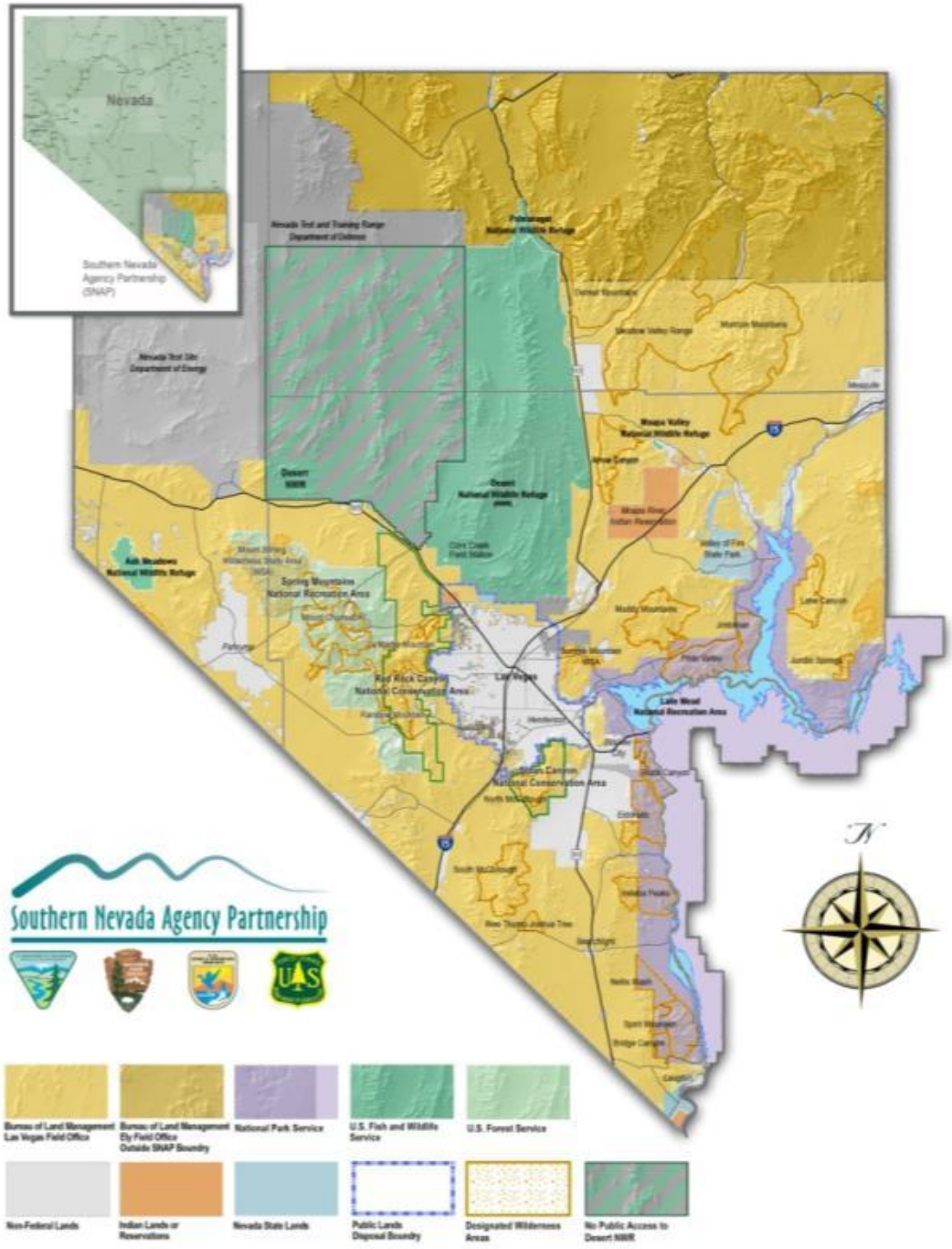
U. S. Fish & Wildlife Service

Species Conservation in a Changing Environment: Strategies at National Wildlife Refuges of Southern Nevada

Cynthia T. Martinez
U. S. Fish and Wildlife Service




National Wildlife
U.S. Fish & Wildlife Service
National Wildlife Refuge System
International Boundary
National Wildlife Refuge
Clear Lake
Modoc
Sheldon
Anaho Island
Fallon
Stillwater
Ruby Lake
Nevada
Desert National Wildlife Refuge Complex
Pahranagat
Desert
Ash Meadows
Moapa Valley
Blue Ridge
Pixley
Hopper Mountain


Nevada
Southern Nevada Agency Partnership (SNAP)
Nevada Test and Training Range Department of Defense
Nevada Test Site Department of Energy
Desert NWR
Desert National Wildlife Refuge (NWR)
Corn Creek Field Station
Pahranagat National Wildlife Refuge
Moapa Valley National Wildlife Refuge
Moapa River Indian Reservation
Ash Meadows National Wildlife Refuge
Spring Mountains National Recreation Area
Red Rock Canyon National Conservation Area
Las Vegas
Lake Mead National Recreation Area
Sloan Canyon National Conservation Area
Southern Nevada Agency Partnership
N
Bureau of Land Management Las Vegas Field Office
Bureau of Land Management Ely Field Office Outside SNAP Boundry
National Park Service
U.S. Fish and Wildlife Service
U.S. Forest Service
Non-Federal Lands
Indian Lands or Reservations
Nevada State Lands
Public Lands Disposal Boundry
Designated Wilderness Areas
No Public Access to Desert NWR

Ash Meadows National Wildlife Refuge

Ash Meadows National Wildlife Refuge

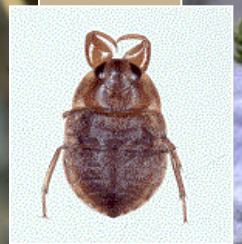
Established in 1984

23,000 acres spring-fed wetlands,
alkaline Mojave Desert uplands

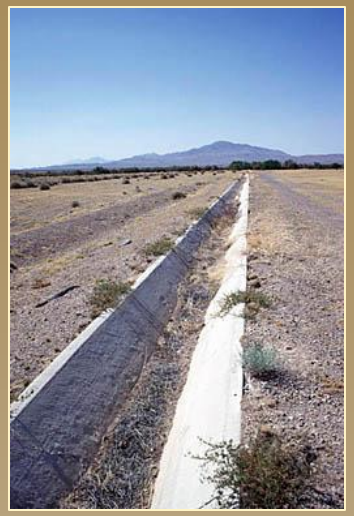
Complex geology – "fossil water" 8,000 – 12,000 yrs
10,000 gallons per min year round

Ash Meadows National Wildlife Refuge

- Purpose: "…To protect the endemic, endangered, and rare organisms (plants and animals) found in Ash Meadows…"
- Highest concentration of endemics (26+) in U.S. and 2nd in North America.
- 14 Federally protected species, most listed species on any Wildlife Refuge in the Refuge System



Ash Meadows National Wildlife Refuge Past Impacts



- Altered hydrology
- Groundwater extraction = lowered water table
- Loss of wetland ecosystem function
- Extinction of endemic species
- Non-native introductions
- Altered fire regime

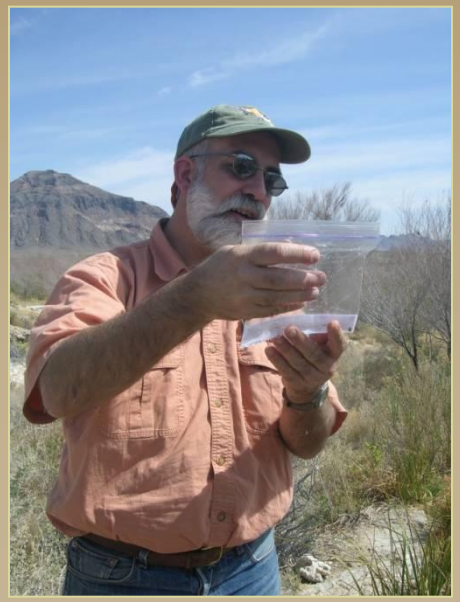
Ash Meadows National Wildlife Refuge

Management goal:

- Restore springs and streams to near natural hydrology and vegetation to recover listed and endemic species
- Climate Change may reduce spring flows further

Management Strategies in response to climate change include:

- Monitoring current conditions

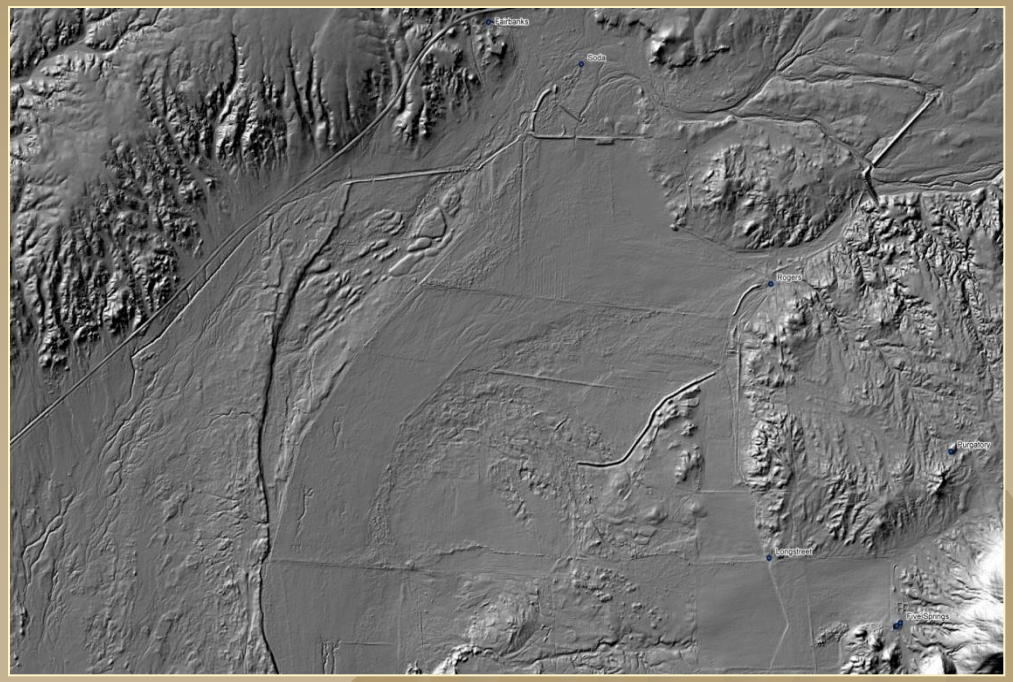


Management Strategies in response to climate change include:

- combining flows of adjacent systems included in stream restoration

Indian Springs restoration

Fairbanks and Soda Springs LiDAR

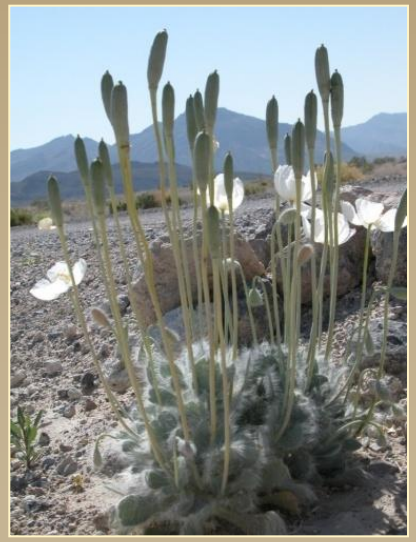


Management Strategies in response to climate change include:

- “naturalized refuge” at School Springs

Management Strategies in response to climate change include:

- Developing propagation techniques for endemic plants
- Translocating fish into habitat areas that they historically occupied



Desert National Wildlife Refuge

Desert National Wildlife Refuge

Established in 1936

- Largest refuge outside of Alaska (1.6 million acres)
- Largest intact desert bighorn sheep habitat
- Rare pristine desert ecology – proposed wilderness
- Annual rainfall ranges from less than four inches on the valley floors to over fifteen inches on the highest peaks.

Desert National Wildlife Refuge

Purposes:

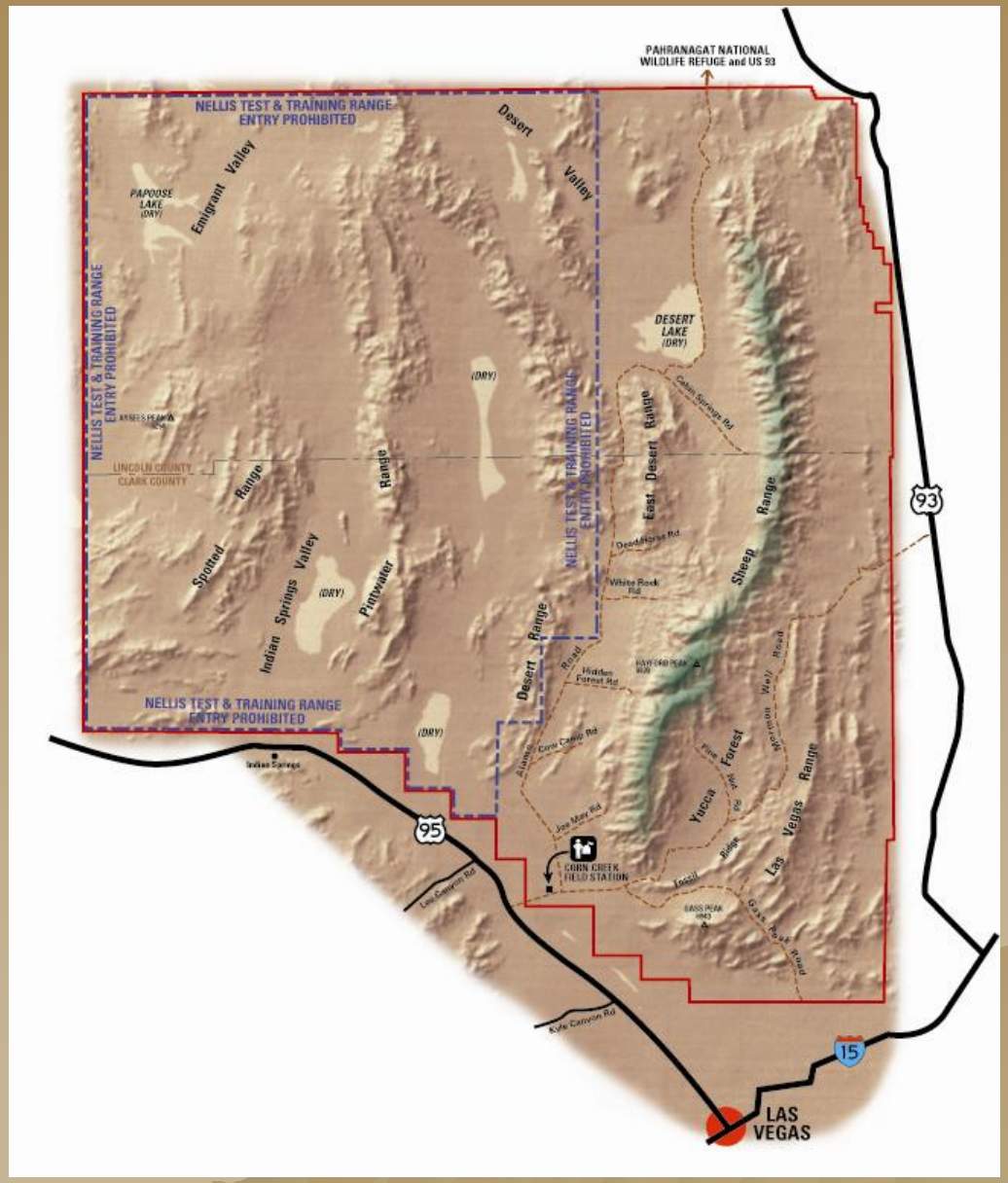
"… for the protection, enhancement, and maintenance of wildlife resources, including bighorn sheep: … Public Land Order 4079"

"… suitable for (1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species … 16 U.S.C. 460k"

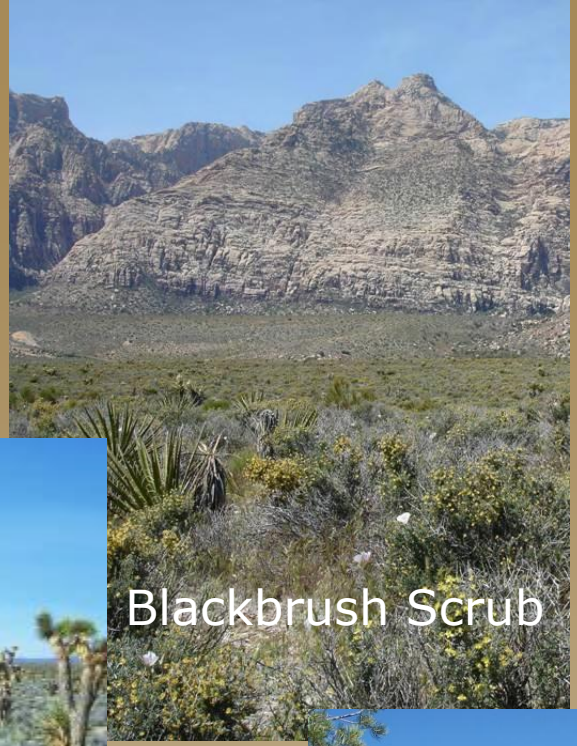
"… to conserve (A) fish or wildlife which are listed as endangered species or threatened species …. or (B) plants … 16 U.S.C. 1534 (Endangered Species Act of 1973)"

Desert National Wildlife Refuge

- 1.6 million acres
- (2,300 square miles)
- 846,000 acres reserved for DoD
- 6 rugged Mt ranges
- 2,200 ft to 10,000 ft
- Diverse flora and fauna
- Occasional springs and wetlands
- endemic species



Desert NWR contains a wide diversity of life zones 2,300 to 10,000 ft elev



Studies at Desert NWR could increase understanding of effects of climate change

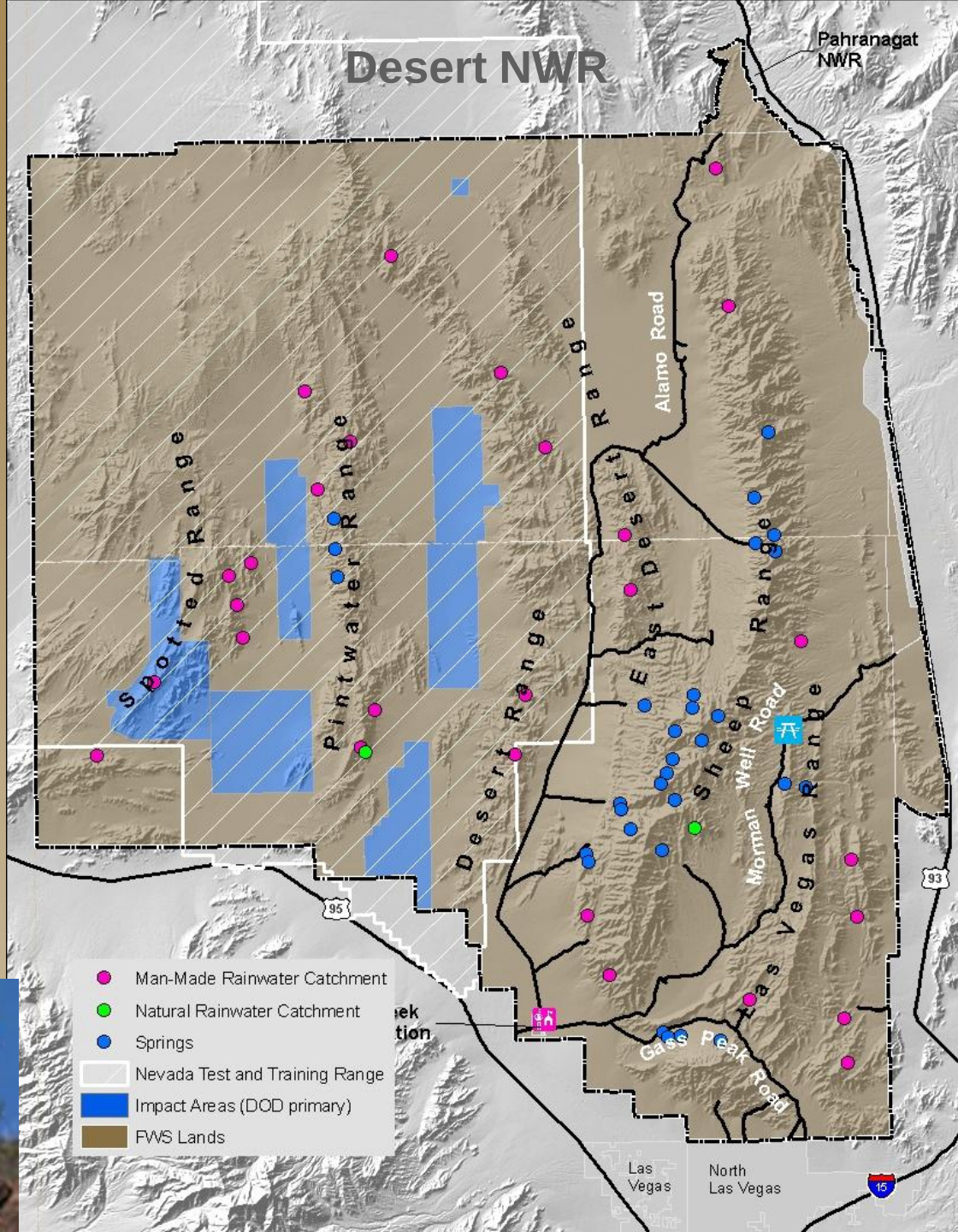
- **Monitor distributions of plants and animals**
- **Preparing a vegetation landcover map and inventory**
- **NSF funded EPSCoR project**

Desert Bighorn Sheep

- Desert bighorn sheep populations in CA in the 20th century contracted to higher and wetter mountain ranges (Epps et al 2004)
- Sheep adapted to hot, dry conditions, but on the edge of their tolerances
- Sheep may retreat further to higher elevation areas with water as climate change advances

Bighorn Sheep Management

- Maintain/increase guzzlers, monitor springs
- Study herd health, diet, predators, genetic diversity
- Conduct fall and spring helicopter survey/year
- Prepare sheep mgmt plan



Species Conservation Challenges

- Narrow endemic species at Ash Meadows NWR
- Wider ranging species at Desert NWR