Trilateral Committee Meeting, San Diego, California
April 13-16, 2015
Species of Common Concern Table

Arizona Ecological Services Office México Program

Mission: Through cooperative binational partnerships, conserve and recover listed and sensitive species of mutual concern to the U.S. and México

Doug Duncan, Fish Biologist
Cat Crawford, Wildlife Biologist
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Scott Richardson, Supervisory Biologist
Erin Fernandez, Mexico Program Coordinator

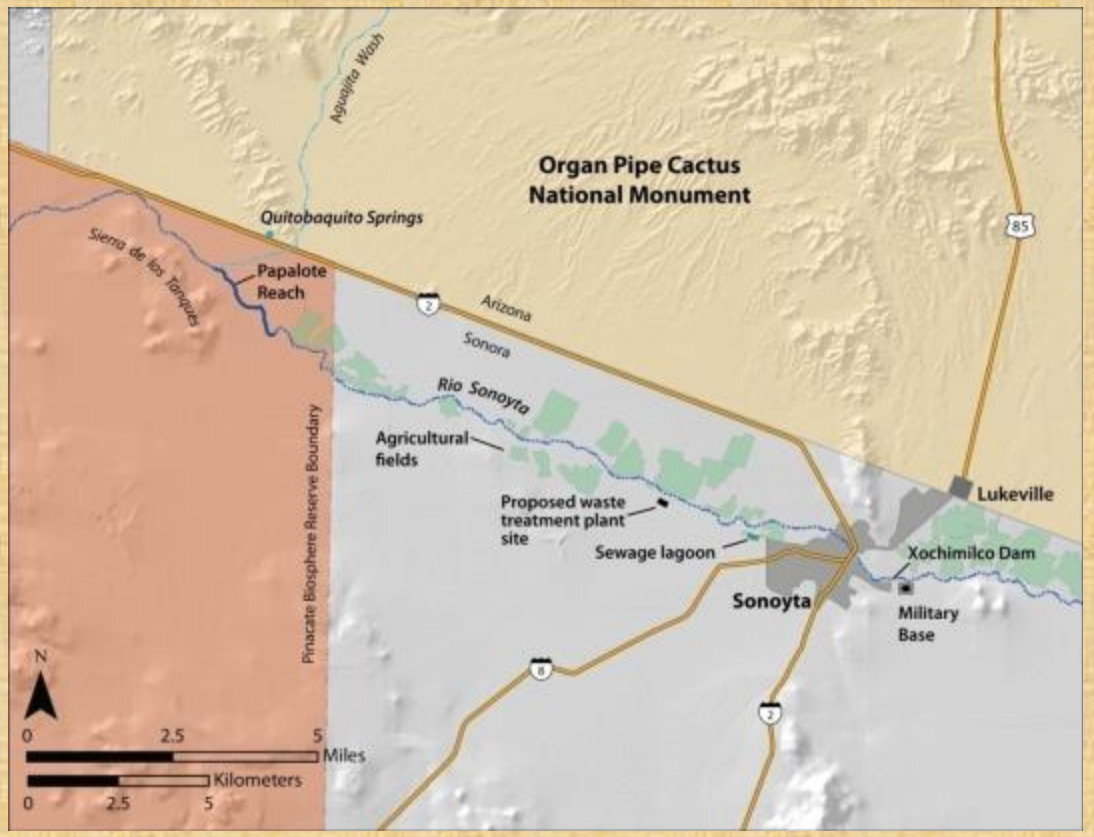
Arizona Ecological Services
Tucson, Arizona
U.S. Fish and Wildlife Service

Conservation and Recovery of Cross-Border Species

- Conservation of the imperiled species of the Rio Sonoyta
- Conservation of the native aquatic vertebrates of the Rio Yaqui basin
- Amphibian and reptile conservation in Northwestern Mexico
- Capacity building for the conservation of bats in northwestern Mexico
- Binational partnerships to recover and conserve species of common concern

Conservation of the Imperiled Species of the Río Sonoyta

- **Sonoyta mud turtle** (Endangered – México, Candidate – U.S.)
- **Rio Sonoyta pupfish** (Endangered – México, Endangered – U.S.)
- **longfin dace** (Threatened – México, None – U.S.)



Threats to Río Sonoyta

- Groundwater withdrawal
- Invasive exotic species currently present
- Species that could be introduced
- Unmet infrastructure needs (e.g., modern sewage treatment facilities)
- Pollutants, Trash

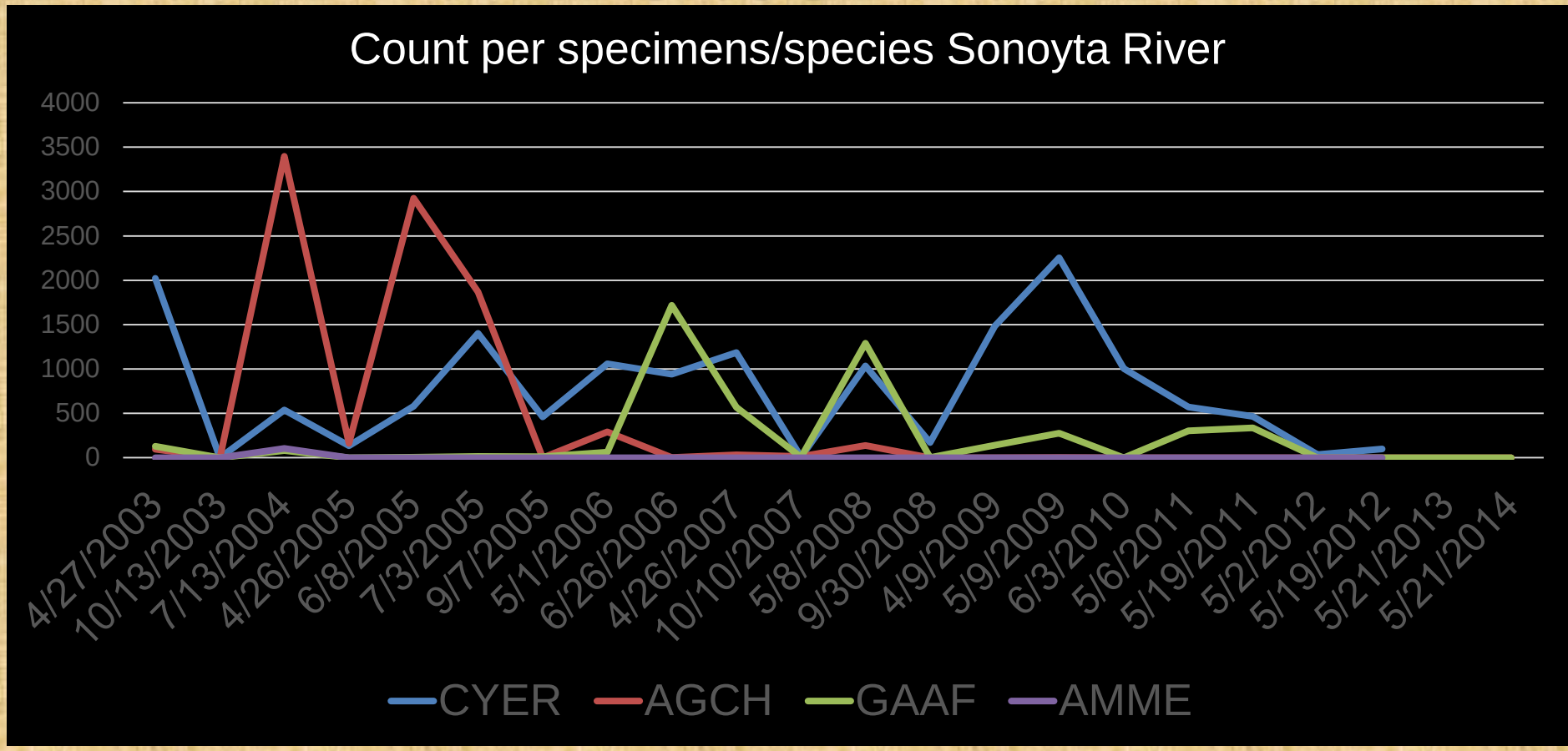
Mosquito Fish

Sonoyta Sewage Lagoon

Río Sonoyta

Río Sonoyta

Fishes



- AGCH: *Agosia chrysogaster*; CYER: *Cypronodon eremus*; GAAF: *Gambusia affinis*; AMME: *Ameiurus melas*

Conservation of the Imperiled Species of Río Sonoyta

On-going projects:

- Monitor populations of mud turtle, pupfish, and longfin dace in the Rio Sonoyta and Quitovac springs
  - Longfin dace not found in Rio Sonoyta since 2008, presumably due to low water
  - 2 pupfish found in 2013
  - Annual monitoring continues on the Rio Sonoyta

Conservation of the Imperiled Species of Río Sonoyta

On-going projects:

- Establish longfin dace refuge at CETMAR high school in Puerto Penasco.
- Conduct outreach about the importance of Rio Sonoyta
  - COBACH (high school in Sonoyta) currently conducting outreach in Sonoyta (website, flyers, facebook, curiculum, presentations)

Conservation of the Imperiled Species of Río Sonoyta

On-going projects:

- Work with the municipal government of Sonoyta, Pinacate, EPA, BECC, and others to ensure that the new wastewater treatment facility in Sonoyta is compatible with species needs

- Work with Sonoyta and Pinacate to transfer mud turtles from the decommissioned wastewater treatment facility to new facility

- Work with Quitobaquito/Rio Sonoyta Work Group to finalize conservation agreement.

Partners: Pinacate Biosphere Reserve, CEDO, COBACH, AGFD, UofA, EPA, ISDA, CETMAR

Native Aquatic Vertebrates of the Rio Yaqui Basin

- Rio Yaqui Basin – high level of endemic and/or endangered fish and other aquatic vertebrate species
- Hendrickson et al. conducted a fish survey at 90 sites in the Rio Yaqui basin in 1978
- Limited surveys and significant anthropogenic change since 1978, including expansion of non-natives

Native Aquatic Vertebrates of the Rio Yaqui Basin

- Seeking funding to resurvey Hendrickson's sites
- Minckley surveys Cuenca los Ojos properties
- Collect status and distribution data on native and non-native aquatic vertebrates
- Ensure integration of this project with the Rio Yaqui Conservation Plan (CONANP, BIDA, Naturalia, TNC)
- Attempting to spawn Yaqui catfish at ASDM and ECR

Partners: UNISON, U of A, Naturalia, AGFD, NMFWCO, AZFWCO, CEDES, SI, SBNWR, U of Texas, Cuenca de los Ojos, USGS, SEMARNAT, DGVS, CONANP, IAS

Amphibian & Reptile Conservation in Northwestern Mexico

- No longer conducting workshops for Inventory, Monitoring, and Conservation of Amphibians in Northwestern Mexico (last one in 2011)
- U.S.G.S. biologists will conduct eDNA sampling for the Sonoran tiger salamander at Reserva Los Fresnos and surrounding areas in northern Sonora in late April 2015
- Recovery actions for the Chiricahua leopard frog in Mexico remain unfunded. Status of the species unknown in most areas of Mexico. Surveys have been conducted at Ajos-Bavispe since 2010.
- Tarahumara frogs extirpated from AZ in 1983; reestablished in the wild with frogs from Mexico in 2004 with subsequent releases through 2015
- Awaiting finalization of Mexico Management Strategy for the flat-tailed horned lizard.



Northern Mexican Gartersnake (*Thamnophis eques megalops*)

U.S. - Listed rangewide as threatened on July 8, 2014
Mexico – Listed as threatened (*Thamnophis eques*)

Habitat: Northern Mexican Gartersnake

Elevations from 40 – 2,591 m

Lentic: cienegas, stock tanks, springs, seeps, etc.

Lotic: protected backwaters, braided side channels and beaver ponds, isolated pools near the river mainstem, and edges of dense emergent vegetation

Lentic

Lotic

Known to use terrestrial habitat ≥ 500 ft from water

Diet: Northern Mexican Gartersnake

Primary prey items are amphibians and fish such as leopard frogs, tiger salamanders, spadefoot toads, woodhouse's toads, chubs, suckers, topminnow, etc.

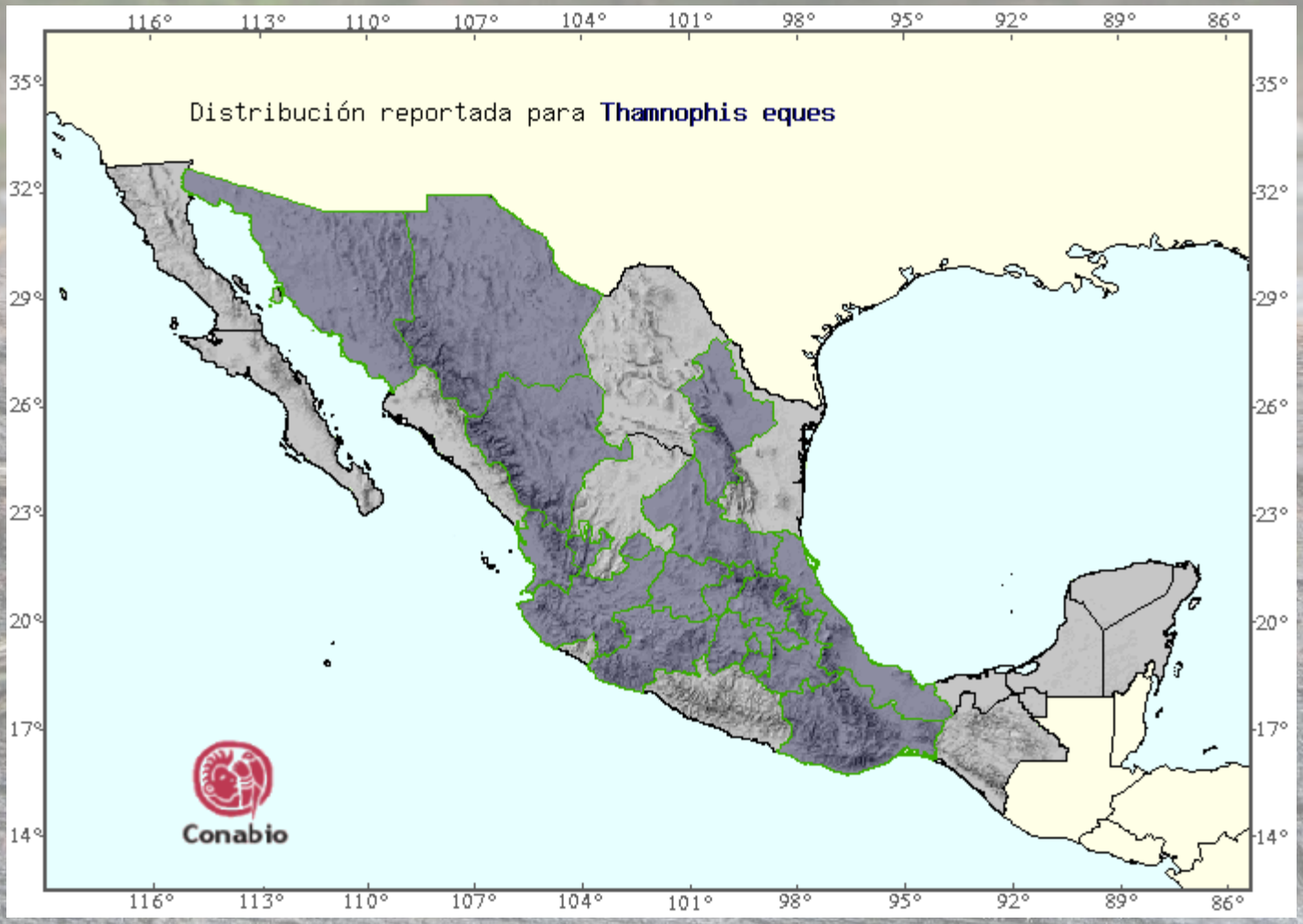


Secondary prey items may include deermice, earthworms, spiny lizards, whiptail lizards, leeches, even other gartersnakes



Nonnatives such as small bullfrogs, bullfrog larvae, and small nonnative fish are taken and may constitute primary prey in some populations

Distribution of the Mexican Gartersnake In Mexico



Why have these snakes been disappearing?

Harmful Nonnative Species

Many riparian and aquatic communities have shifted from being primarily native, to being dominated by harmful nonnatives.

Harmful Nonnative Species

Bass
(*Micropterus* sp.)

Sunfish
(*Lepomis* sp.)

Flathead Catfish
(*Pylodictis* sp.)

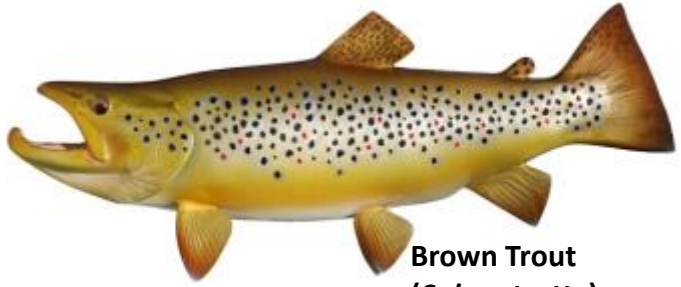
American Bullfrog
(*Lithobates catesbeiana*)

Channel Catfish
(*Ictalurus* sp.)

Bullhead Catfish
(*Ameiurus* sp.)

Crappie
(*Pomoxis* sp.)

Northern (Virile) and Red Swamp Crayfish
(*Orconectes virilis* and *Procambarus clarkii*)



Brown Trout
(*Salmo trutta*)

Native Fish Communities In Decline

In Mexico …

Over one-third of native fish species are considered endangered, facing extinction, under special protection, or likely extinct.

Vanishing Surface Flow


Wildfire
Photo © Cameron Strandberg

Recovery Planning

- Binational
- Ecosystem-based
- Focused on addressing nonnative problem

Photo © Jim “Fred” Rorabaugh

Sonoran Desert Tortoise (*Gopherus morafkai*)

U.S. – Candidate

Mexico – Threatened (*Gopherus agassizii*)

Under evaluation for listing with decision on or before September 30, 2015.

Possible outcomes include:

- Proposed rule for listing, or
- Withdrawal

Habitat

- Generally occurs between 155 – 1,615 m elevation, has been observed as high as 2,377 m
- Habitat types include:

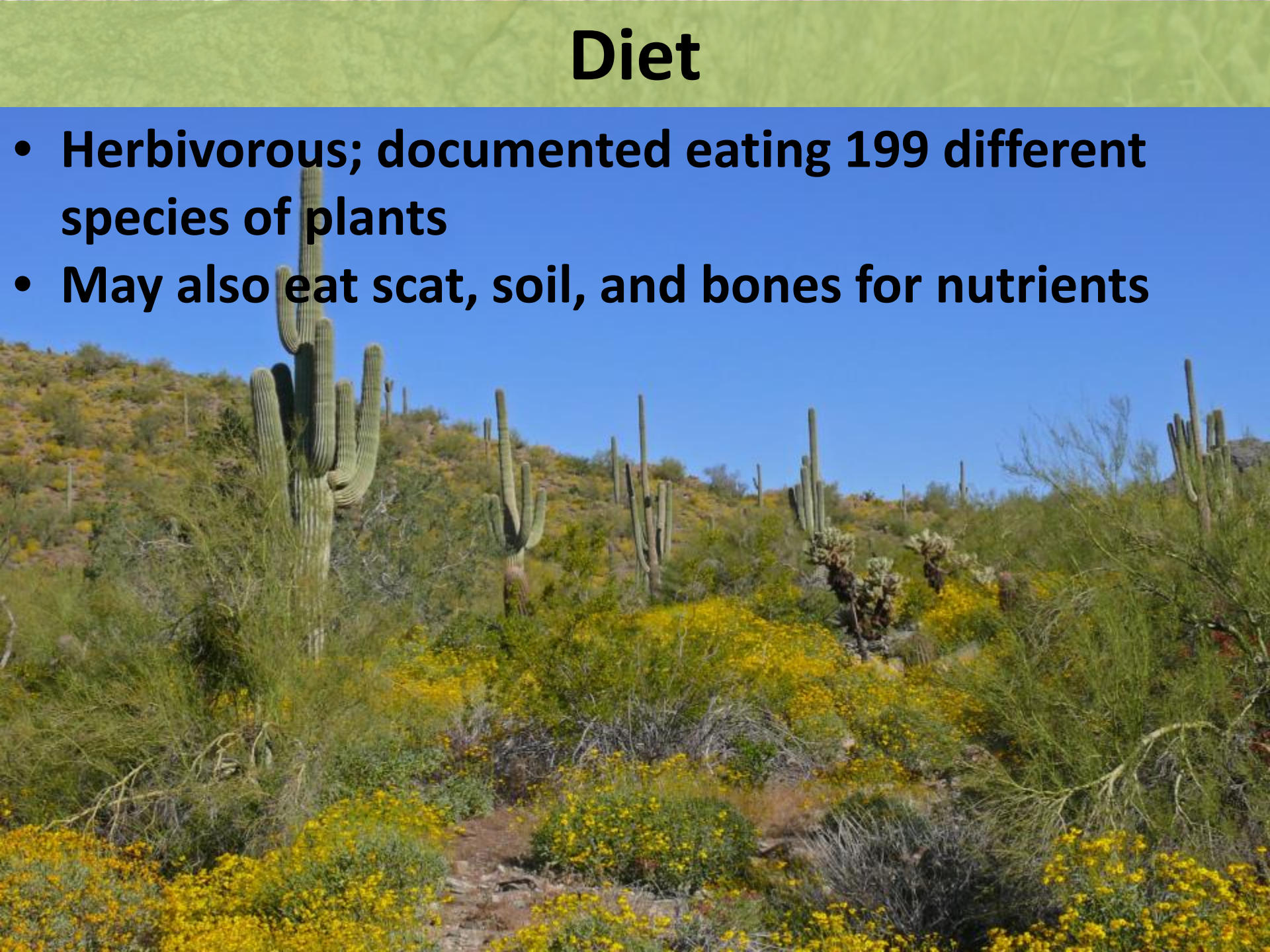
Sonoran Desertscrub

Madrean Oak Savannah

Tropical Thornscrub

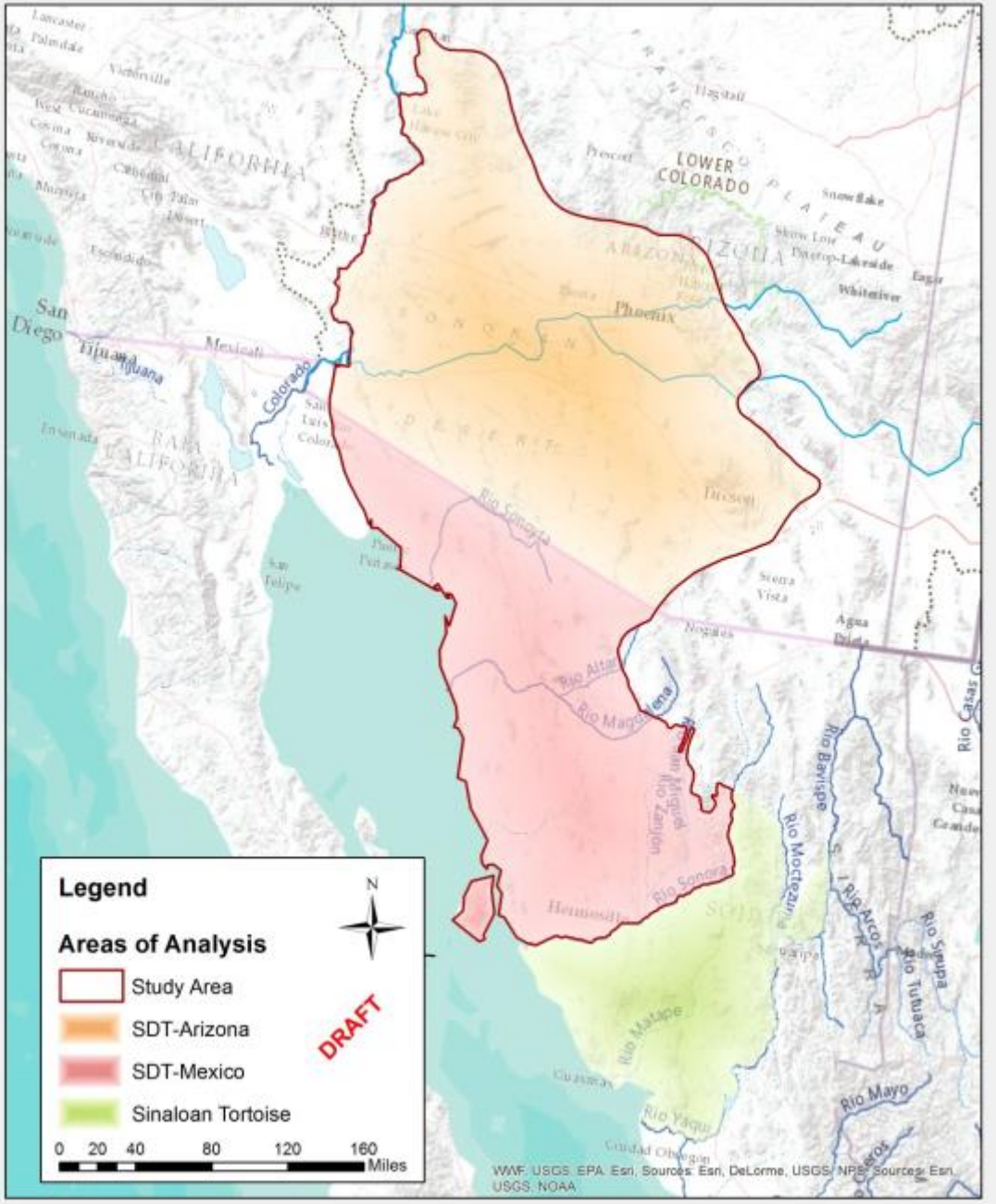
Diet

- Herbivorous; documented eating 199 different species of plants
- May also eat scat, soil, and bones for nutrients

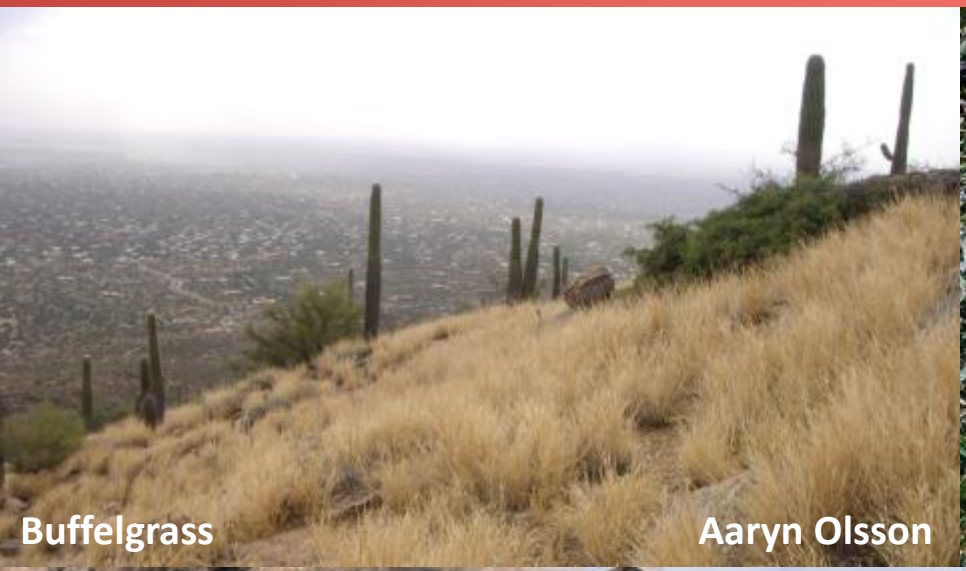


Distribution

Areas of Analysis for the Sonoran Desert Tortoise (SDT)
(Gopherus morafkai)



Potential Stressors: Nonnative African Grasses



Buffelgrass Aaryn Olsson

Red brome Arizona Sonora Desert Museum

Cheatgrass P. Weisberg

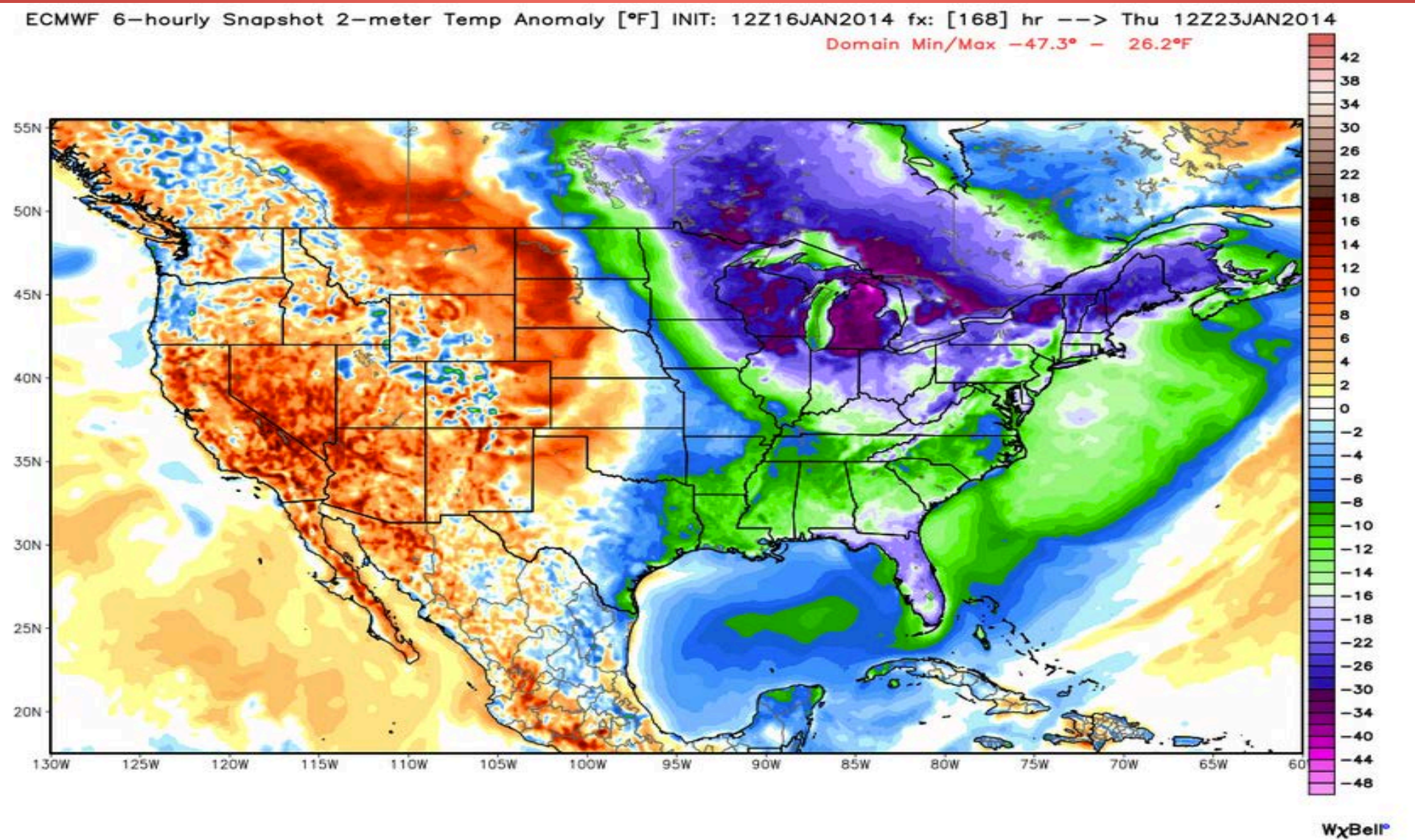
Sahara Mustard Arizona Sonora Desert Museum

Potential Stressors: Altered Fire Regime

Potential Stressors: Habitat Conversion

Potential Stressors: Linear Development

Potential Stressors: Climate Change/Drought



Potential Stressors: Human-Urban Interactions

Bat Conservation Program in Northwestern Mexico

- Mexico has one of the world's highest diversities of bats - 139 species
- Of great ecological and economic importance
- Some bat populations declining at alarming rates (roost disturbance/destruction, foraging habitat loss/degradation, changing water, food, roost resources - climate change)




Bat Conservation Program in Northwestern Mexico

- Working to build capacity for bat conservation in northwestern Mexico through:
  - training workshops, surveys, monitoring, and recovery actions
  - Providing equipment as we are able
- Partners: Naturalia, UNAM, U. of Queretaro, UNISON, AZGFD, CONANP, U of A, AZ Sonora Desert Museum

Building Capacity for Bat Conservation in Northwestern Mexico

- Developed workshop (in Spanish): Inventory, Monitoring, and Conservation of Bats in Northwestern Mexico

- From 2008 to 2011: 6 workshops given at the Northern Jaguar Reserve and Rancho Los Fresnos

Building Capacity for Bat Conservation

- Include theoretical and practical sessions
- Participants: over 80 biologists and educators from Federal and State Agencies and NGOs, university students, and members of the Yaqui Tribe
- Funding: WWB-Mexico; BCI; Naturalia; FWS; AZGFD; CONANP; UNAM; AZ Sonora Desert Museum

Building Capacity for Bat Conservation

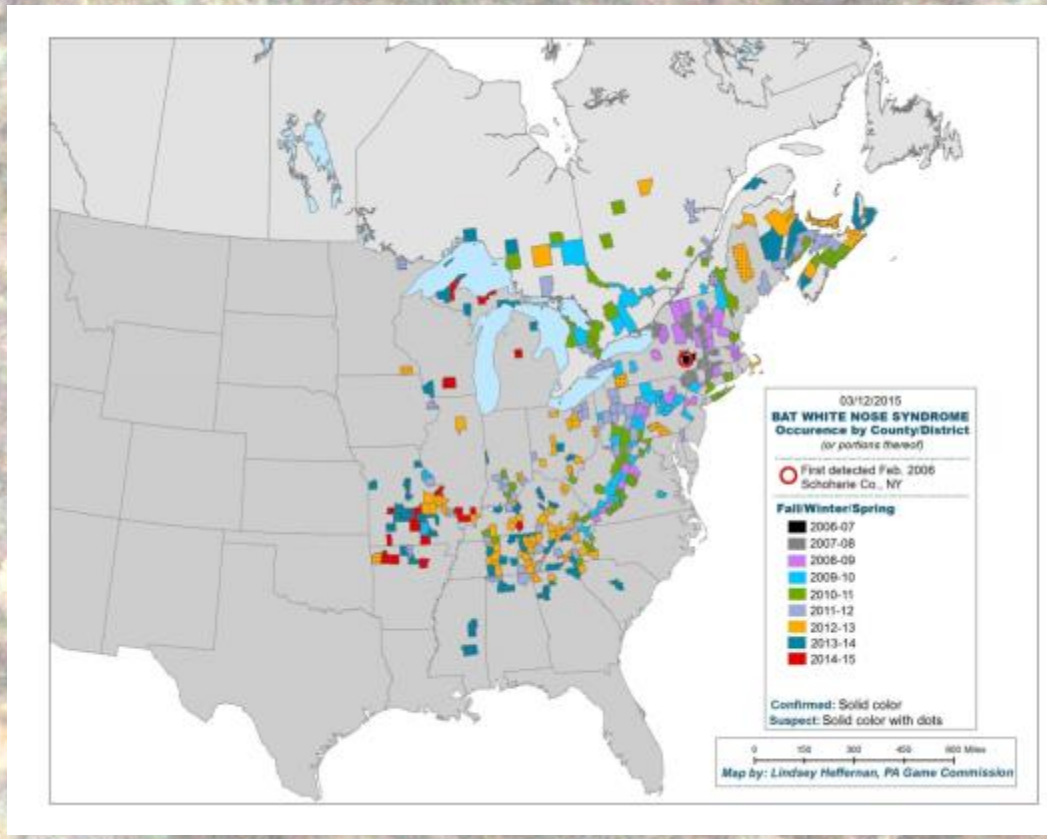
- Documented 10 species of bats at RLF and 12 at NJR
- Follow up to workshops – visit ANPs to assist with establishing long-term monitoring programs
  - Visited Sierra de Alamos-Rio Cuchujaqui and Ajos Bavispe
- Workshops and visits to be resumed when travel restrictions lifted

Environmental Education - Bats in Sonora

- Environmental education program initiated focused on bats as result of workshops (Naturalia, BCI, FWS)
- Program implemented by two workshop graduates (Grecia Casillas, Veronica Bracamontes)
- Graduates will continue teaching workshops in the future
- Continued support via equipment and technical assistance.

White-Nose Syndrome

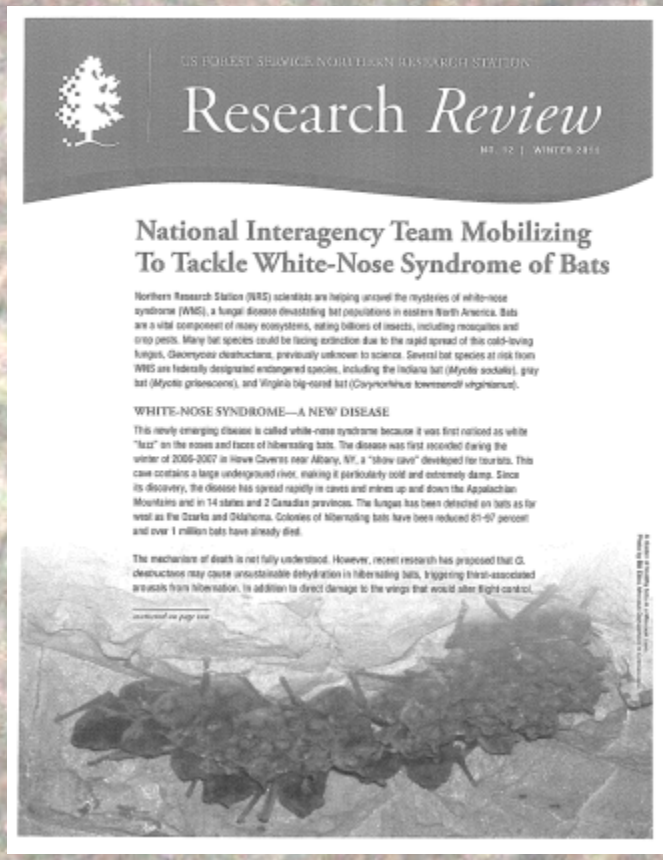
- The fungus, *Pseudogymnoascus destructans*, has been demonstrated to cause WNS
- Over 90% mortality at many affected sites
- Spreading rapidly, behaves like a pathogen
- Recent estimates indicate that 5.7 million to 6.7 million bats have fallen victim to WNS



White-Nose Syndrome

What does this mean for Mexico and the southwestern U.S.?

- WNS is not here yet, but we need to be aware!
- Bat species, species' behavior, and climate may reduce the likelihood it will spread here
- Need to prepare – monitoring, plans, protocols
- This is such a devastating disease that we need to be proactive
- Need long-term bat research and monitoring
- Information and resources found on FWS website: www.fws.gov/whitenosesyndrome/



US FOREST SERVICE NORTHERN RESEARCH STATION

Research *Review*

NO. 52 | WINTER 2011

National Interagency Team Mobilizing To Tackle White-Nose Syndrome of Bats

Northern Research Station (NRS) scientists are helping unravel the mysteries of white-nose syndrome (WNS), a fungal disease devastating bat populations in eastern North America. Bats are a vital component of many ecosystems, eating billions of insects, including mosquitoes and crop pests. Many bat species could be facing extinction due to the rapid spread of this cold-loving fungus, *Geomyces destructans*, previously unknown to science. Several bat species at risk from WNS are federally designated endangered species, including the Indiana bat (*Myotis sodalis*), gray bat (*Myotis grisescens*), and Virginia big-eared bat (*Corynorhinus townsendii virginianus*).

WHITE-NOSE SYNDROME—A NEW DISEASE

This newly emerging disease is called white-nose syndrome because it was first noticed as white "fuzz" on the noses and faces of hibernating bats. The disease was first recorded during the winter of 2006-2007 in Howe Caverns near Albany, NY, a "show cave" developed for tourists. This cave contains a large underground river, making it particularly cold and extremely damp. Since its discovery, the disease has spread rapidly in caves and mines up and down the Appalachian Mountains and in 14 states and 2 Canadian provinces. The fungus has been detected on bats as far west as the Ozarks and Oklahoma. Colonies of hibernating bats have been reduced 81-97 percent and over 1 million bats have already died.

The mechanism of death is not fully understood. However, recent research has proposed that *G. destructans* may cause unsustainable dehydration in hibernating bats, triggering thirst-associated arousals from hibernation. In addition to direct damage to the wings that would alter flight control,

continued on page xxx

Binational Partnerships to Conserve Species of Common Concern

- Support conservation efforts of land owners and managers through surveys and technical assistance

- El Aribabi, Los Fresnos, Northern Jaguar Reserve, Alamos, Ajos-Bavispe, Pinacate, Alto Golfo, Islas del Golfo, San Lazaro, etc.

Species of Common Concern Meeting Pinacate, OPCNM, CPNWR, AGFD, USBP, Ecogrande, and AESO

- Sonoran pronghorn, lesser long-nosed bat, Rio Sonoyta pupfish, Sonoyta mud turtle, etc.

- Planned for future joint projects

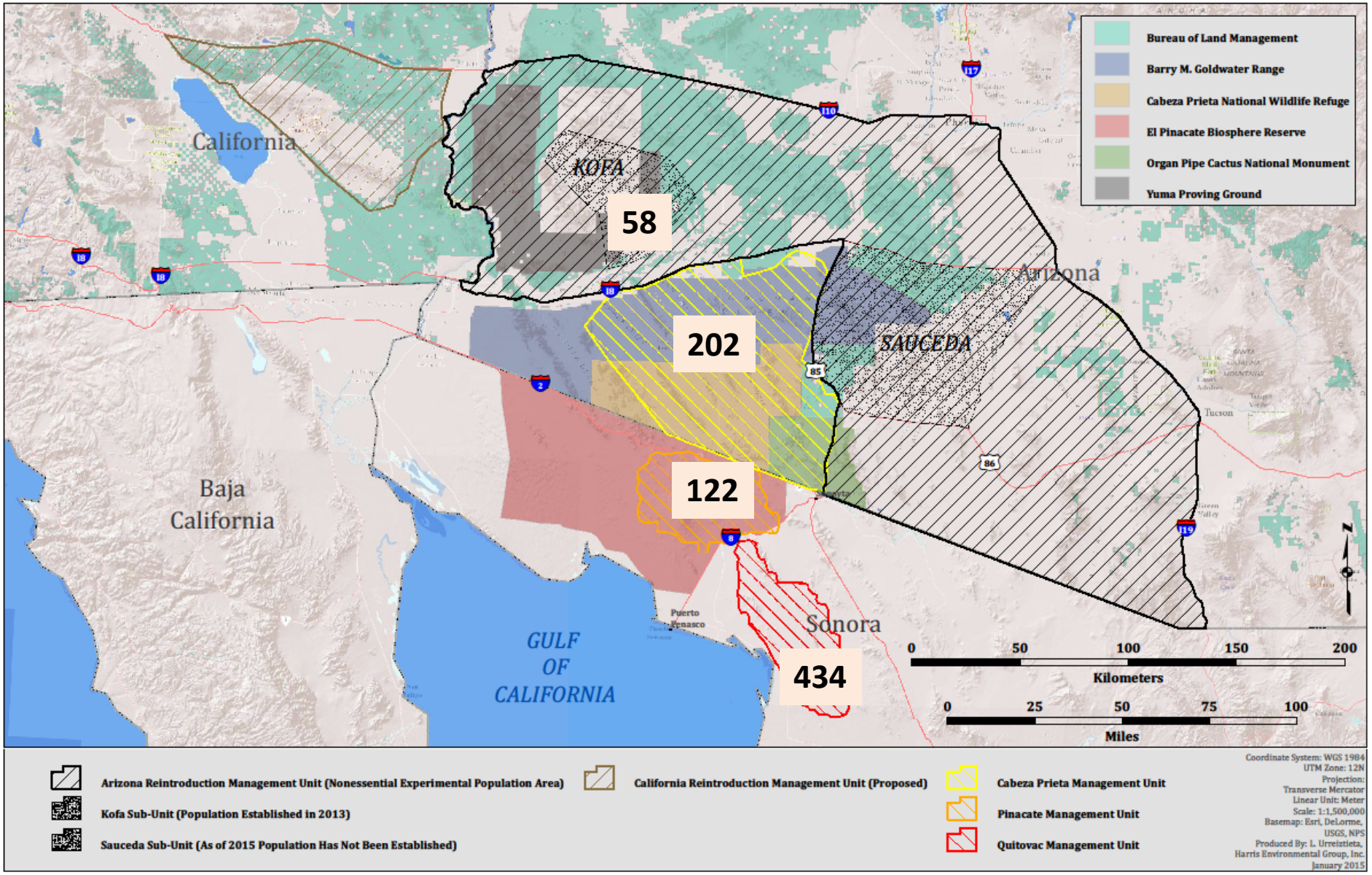
Recovery of Sonoran Pronghorn

Endangered - México & U.S.

Support ongoing efforts to conserve the Sonoran Pronghorn in AZ and Sonora:

- Surveys and monitoring
- Captive breeding program in AZ
- Establishment of new population in AZ (Kofa NWR)
- Genetics research
- Other conservation projects (e.g., forage enhancements, food plots, waters, livestock fence modification, conservation outreach, etc.)
- Update Recovery Plan – binational (Draft Recovery Plan available soon for public review)

- Partners: AGFD, FWS-CPNWR and Kofa NWR, CONANP, CEDES, DOD, NPS, many others

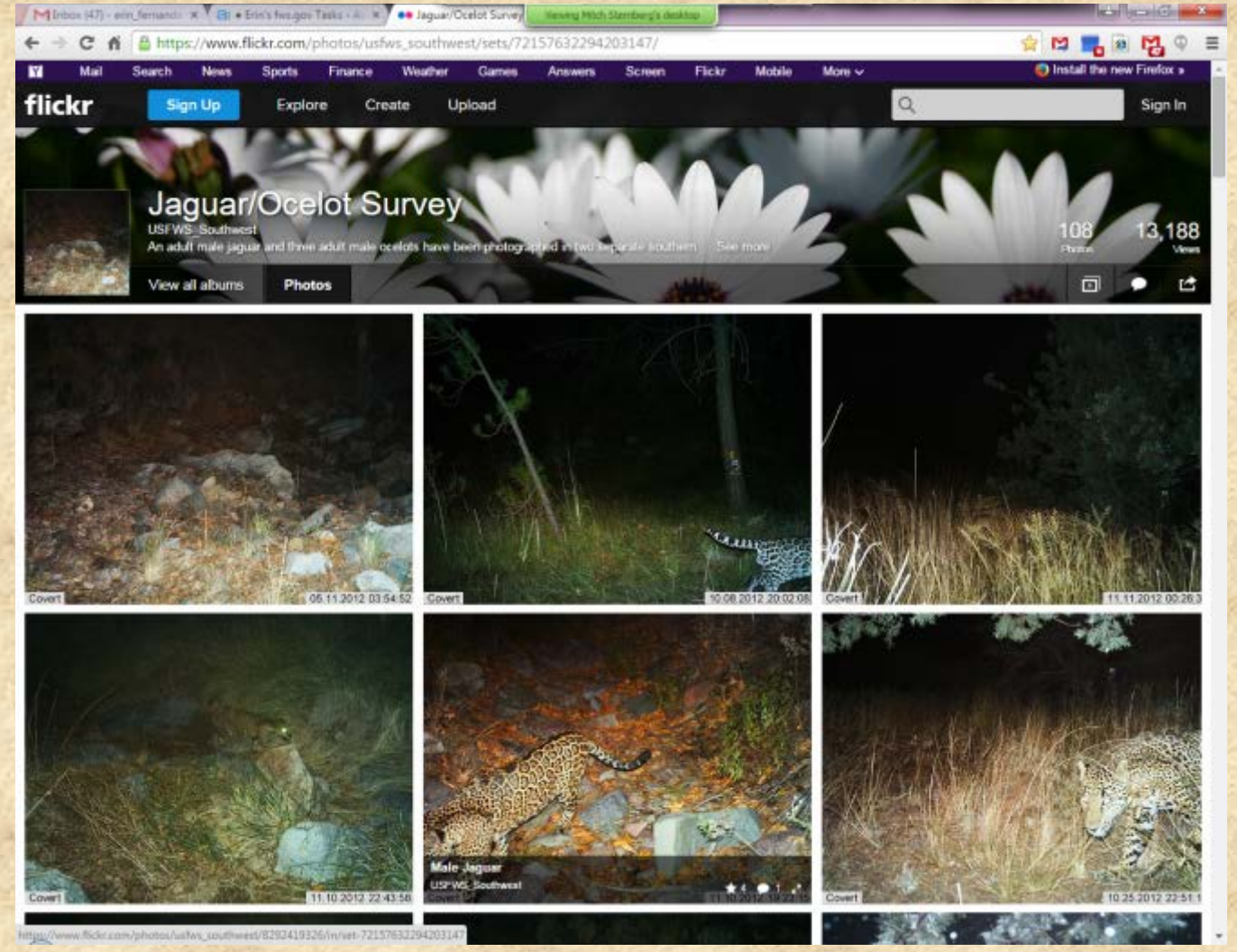

Bureau of Land Management
Barry M. Goldwater Range
Cabeza Prieta National Wildlife Refuge
El Pinacate Biosphere Reserve
Organ Pipe Cactus National Monument
Yuma Proving Ground
California
KOFA
58
202
SAUCEDA
Arizona
122
Baja California
GULF OF CALIFORNIA
Puerto Penasco
Sonora
434
Tucson
0 50 100 150 200
Kilometers
0 25 50 75 100
Miles
Arizona Reintroduction Management Unit (Nonessential Experimental Population Area)
Kofa Sub-Unit (Population Established in 2013)
Sauceda Sub-Unit (As of 2015 Population Has Not Been Established)
California Reintroduction Management Unit (Proposed)
Cabeza Prieta Management Unit
Pinacate Management Unit
Quitovac Management Unit
Coordinate System: WGS 1984
UTM Zone: 12N
Projection: Transverse Mercator
Linear Unit: Meter
Scale: 1:1,500,000
Basemap: Esri, DeLorme, USGS, NPS
Produced By: I. Urreiztieta, Harris Environmental Group, Inc.
January 2015

Ocelot Recovery

Endangered - México & U.S.

- Jaguar and ocelot survey and monitoring in AZ and NM (contract with UA)
  - 12 photos of 3 ocelots (5 ocelots detected in AZ since 2009; all males)
- Similar effort by the Tohono O'odham Nation
- Jaguar and ocelot citizen science, education, and outreach (contract with USGS)

https://www.flickr.com/photos/usfws_southwest/sets/72157632294203147/



Plant Recovery

- Huachuca water umbel (*Lilaeopsis schaffneriana* ssp. *recurva*) – Endangered – U.S.; Not listed – Mexico
  - A Draft Recovery Plan for the Huachuca water umbel will be published in the Federal Register later this year. We seek comments on this draft plan.
- There are many rare plants of mutual concern in the border region:

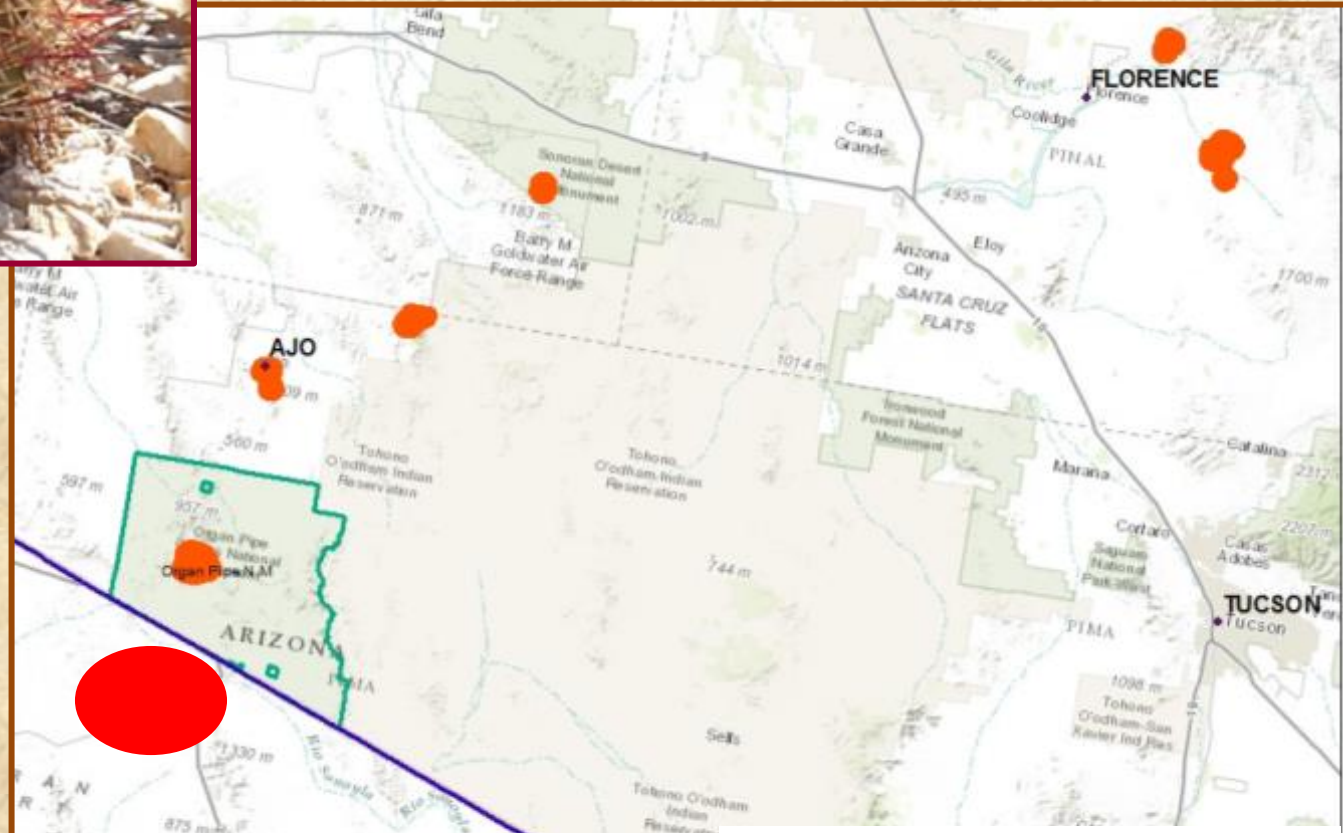
Acuna cactus	*Echinomastus erectocentrus* var. *acunensis*
Bartram stonecrop	*Graptopetalum bartramii*
beardless chinchweed	*Pectis imberbis*
Canelo Hills ladies' tresses	*Spiranthes delitescens*
Cochise pincushion cactus	*Coryphantha robbinsorum*
Huachuca water umbel	*Lilaeopsis schaffneriana* ssp. *recurva*
Pima pineapple cactus	*Coryphantha scheeri* var. *robustispina*

Please contact our Plant Ecologist , Julie_Crawford@fws.gov, with information about any of these species in Mexico.

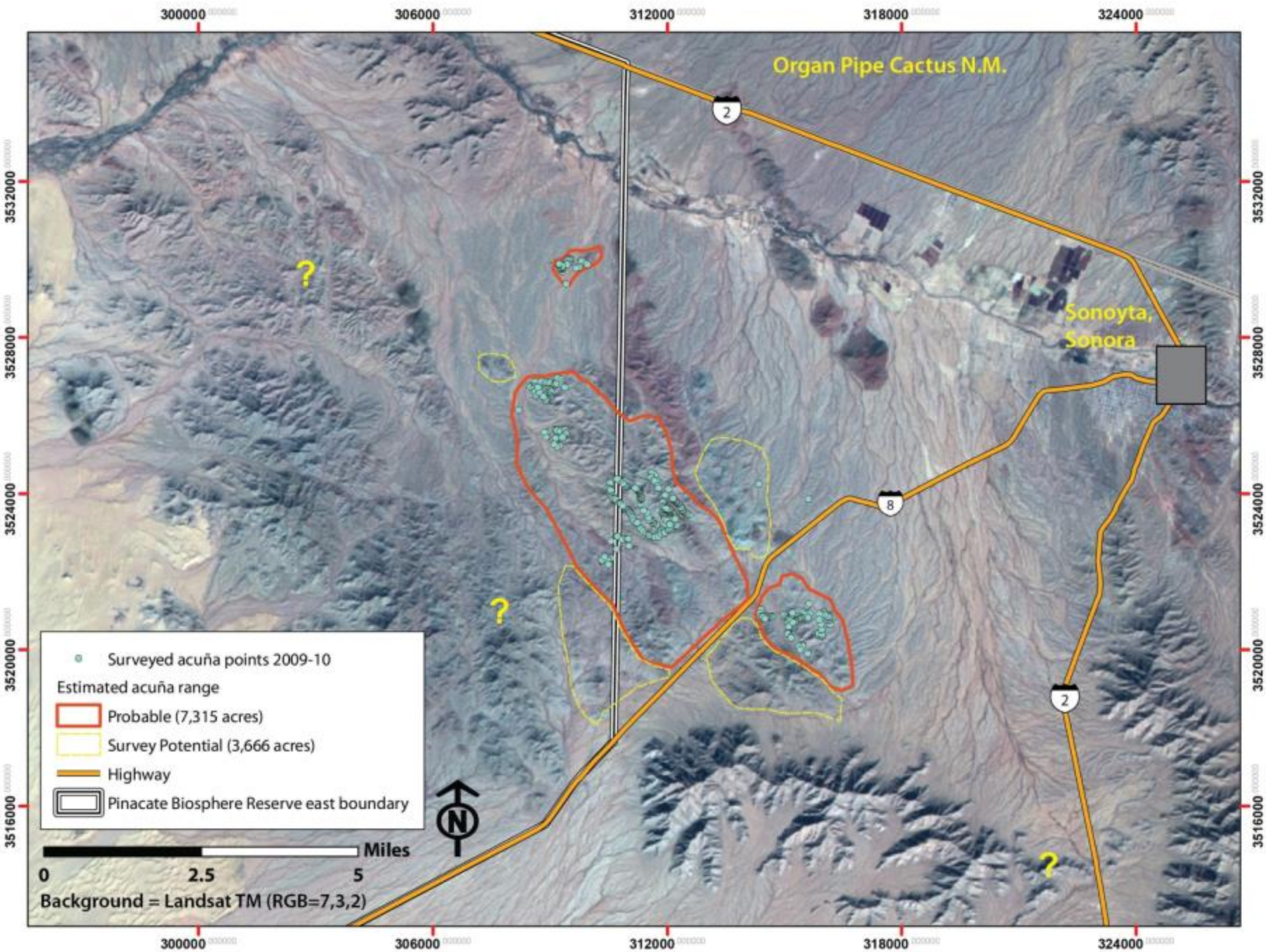
Acuña cactus (*Echinomastus erectocentrus var. acunensis*)

Endangered - México & U.S.

Range: Ninety-nine percent of the range-wide acuña cactus individuals are found within ~105 kilometers (65 miles) of the Arizona-Mexico border.



General locations of known acuña cactus populations


300000
306000
312000
318000
324000
3532000
3528000
3524000
3520000
3516000
Organ Pipe Cactus N.M.
Sonoyta, Sonora
2
8
?
?
?
Surveyed acuña points 2009-10
Estimated acuña range
Probable (7,315 acres)
Survey Potential (3,666 acres)
Highway
Pinacate Biosphere Reserve east boundary
N
Miles
0
2.5
5
Background = Landsat TM (RGB=7,3,2)

Primary Threats: Drought and climate change, in combination with native insect attack; border activities degrade habitat and could result in direct mortality by running over individual cacti

Recovery Planning: The USFWS will begin drafting a Recovery Plan for the taxon in 2017. We welcome any new information to inform this plan; please contact julie_crawford@fws.gov

Support Thick-billed Parrot Conservation in Mexico

- We offer our assistance to Mexican partners in preparing/reviewing funding proposals for work in Mexico
- We support Mexico in conserving TBPA in Mexico (recovery Strategies from PACE) and in implementing actions from 2014 bi-national workshop
- Prevent illegal trade of TBPA into U.S.
- Maintain forested U.S. historical habitat

Conservation of Birds of Common Concern

Continue to support ongoing efforts to conserve:

- Ferruginous Pygmy-Owl (surveys, genetic research, captive breeding, nest boxes)
  - Ongoing litigation in U.S. related to ESA listing
  - Ongoing surveys and monitoring
- Masked Bobwhite (surveys, captive breeding, habitat conservation and restoration, etc.)

Partners: AGFD, SJV, BANWR, CEDES, Africam Safari Zoo, Monte Sonorense, Ranchos San Dario & Carrizo, CONANP, Instituto Tecnológico y de Estudios Superiores de Monterrey, Pronatura Noreste





We request Trilateral Committee endorsement for our ongoing and future activities to conserve and recover shared species of common concern

Erin Fernandez
Mexico Program Coordinator
U.S. Fish and Wildlife Service
Arizona Ecological Services
Tucson, Arizona

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Erin_fernandez@fws.gov