

### USDA Conservation Reserve Program



### Agriculture and Biodiversity – How?

- Avoid converting sensitive or priority habitats to agricultural production.
  - Where possible, restore sensitive habitats using native vegetation that historically occupied the site, focusing on areas identified by landscape scale plans.
  - Maintain vegetation around water bodies to provide functioning ecological systems that support fish and wildlife.
  - Manage habitats on farms/ranches with an eye toward the larger landscape and needs of wide-ranging species; connected patches are generally best, however, some species need large continuous areas.
  - Prevent the introduction and spread of invasive species of plants and animals.
  - Manage crop and rangelands to meet the habitat needs of fish and wildlife.
  - Develop a working knowledge of native plants and animals in the area and if possible monitor for selected indicator species from different groups.
- [foodalliance.org](http://foodalliance.org)

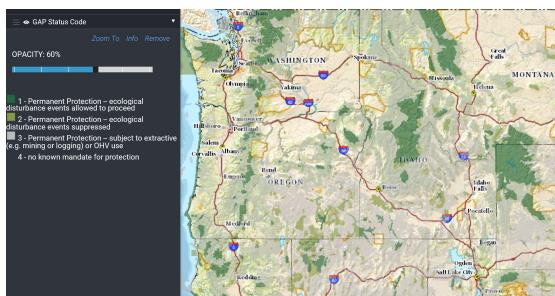
### Vision for the Future

Food Alliance works at the juncture of science, business and values to define and promote sustainability in agriculture and the food industry, and to ensure safe and fair working conditions, humane treatment of animals, and careful stewardship of ecosystems. Originated in 1993 at OSU, WSU, Washington State Department of Agriculture.

- An agricultural landscape in which native plant and animal communities co-exist with agriculture and sustain ecosystems over time.
- Farmers and ranchers seek out and are given the technical support needed to manage working landscapes that support healthy, sustainable fish and wildlife populations.
- The general public assumes their responsibility in preventing the spread of invasive species so farmers and ranchers do not disproportionately bear the costs for their control.
- Farmers are rewarded for special efforts to integrate habitat into their operations.
- Ranchers are rewarded for maximizing the habitat value of grasslands and rangelands, and for including species other than livestock in their natural resource management decisions.

[foodalliance.org](http://foodalliance.org)

### GAP Analysis Project



GAP looks at how well we are protecting common species by overlaying species distribution models with maps of protection status.

Can private land contribute to conservation of biodiversity?

What if you have an endangered species on your land?

The Northern Idaho ground squirrel (*Urocitellus brunneus brunneus*) was listed as a threatened species under the Endangered Species Act (ESA) in April 2000.

Populations are only found in Adams and Valley Counties of western Idaho.

It is estimated the population of squirrels has declined by 80% from initial surveys in 1985. 450-500 animals in 2002.

Photo Public Domain by Diane Evans-Mack, Idaho Department of Fish and Game



Habitat characterized by meadows, shrub/grasslands and open savanna-like woodlands

Southfacing aspects with early spring snowmelt where vegetation emerges early

Hibernate 8-9 months per year (July – February)

Emerges in early spring to feeding and breeding

Forages on seeds (grass and forbs), bulbs, roots, and other plant material

2003 NidGS Recovery Plan <https://species.idaho.gov/list/groundsquirrels.html>

## Why did they decline?

**Northern Idaho Ground Squirrel Probable Historic Distribution**

- ✓ Loss of habitat and habitat fragmentation
- ✓ Conversion of grassland/shrubland to agriculture or developed land
- ✓ Expansion of forest, especially high density of small trees. Open forest/savanna can serve as habitat
- ✓ Human impacts such as fire suppression, shooting, poisoning
- ✓ Competition with the larger Columbia ground squirrel
- ✓ Genetic isolation and drift
- ✓ Disease?

2003 NidGS Recovery Plan <https://species.idaho.gov/list/groundsquirrels.html>

## Safe Harbor Agreements for Endangered Species

**U.S. Fish & Wildlife Service  
Endangered Species**

**For Landowners | Safe Harbor Agreements**

A Safe Harbor Agreement (SHA) is a voluntary agreement between the U.S. Fish and Wildlife Service and a Federal property owner whose actions will not result in the extinction or substantial impairment of a species listed as threatened or endangered under the Endangered Species Act (ESA). The Service and the property owner will cooperatively non-Federal landowner to help protect the species.

Safe Harbor Agreements are designed to help landowners who are responsible for habitat that is important to a listed species. It is a voluntary agreement between the Service and a landowner that protects habitat for a listed species. The landowner agrees to certain actions that contribute to the recovery of the species. In return, the Service provides assurances to the landowner that it will not require additional conservation measures under the ESA if the landowner complies with the terms of the SHA without the need to consult with the Service under the ESA.

Find answers to frequently asked questions regarding safe harbor agreements.

## Candidate Conservation agreements for candidate species

**U.S. Fish & Wildlife Service  
Endangered Species**

**Candidate Conservation Agreements**

Candidate Conservation Agreements (CCAs) are voluntary conservation agreements between the U.S. Fish and Wildlife Service (Service) and one or more public or private parties. The Service works with its partners to identify threats to candidate species, plan and design implementation measures, and monitor their effectiveness.

**Rare Native Grass Will Benefit from Multi-Agency Agreement**

Within Big Bend National Park's steering and monitoring committee, just to the east are the U.S. and Big Bend National Park in Texas. There are two other key organizations in adjacent Coahuila, Mexico. The grass is native to the area and is currently being harvested. The Service and its partners will work together to develop a CCA to cooperate on the conservation of Quadtape grass. Strategies to be implemented include Big Bend National Park, Guadalupe Mountains National Park and the Service's Austin office.

The CCA advocates a number of actions to conserve Quadtape grass and minimize threats. If successful and fully implemented, the agreement calls for monitoring the leaven population, establishing a conservation team of experts for the species, educating land owners, monitoring and controlling exotic plants and animals. The plan also calls for cooperation with Mexico to conserve habitat and reduce threats to the species. Habitat management and restoration activities to maintain and improve habitat will be conducted. The agreement also calls for performing genetic studies.

The federal agencies will cooperate to seek funding for the additional studies. The current agreement builds on one signed between the Service and the Mexican government in 2006.

Quadtape grass is native to isolated mountain ranges in western Texas and northern Coahuila, Mexico. It was first found at one location in 1994 and at one location in Big Bend National Park later the same year. It has not been found in the Guadalupe Mountains for many years.

**Nesting and Brood Rearing from Shrub Cover Intersected with 2-Mile Lek Buffer**

**BLM Grazing Allotments**

**Shrub density**

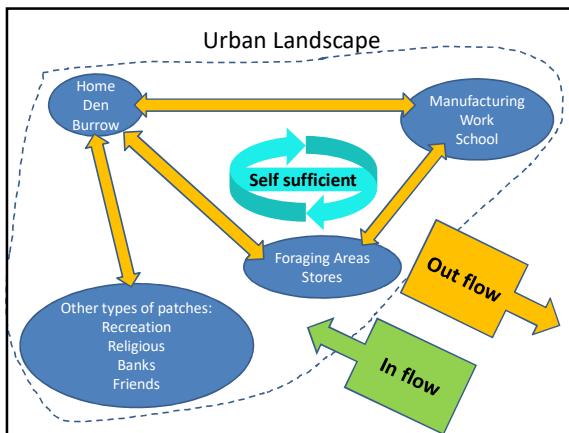
- Agricultural land
- Grassland
- Shrub - High Density
- Shrub - Medium Density
- Riparian
- Water
- Nesting habitat
- BLM Grazing Allotments

## Evaluation Criteria

- Continuing education for wildlife habitat issues:** Managers who can identify native vegetation, and/or manage their operations in a way that protects threatened and endangered species and priority habitat types also score well.
- Habitat conservation improvements:** Producers who have invested in habitat conservation and/or restoration are recognized in the scoring process.
- Invasive species prevention and management:** Higher scores are awarded to managers who do not commercially produce invasive species; control and eradicate established invasive species when possible; and prevent the introduction and establishment of new invasive species on their land.
- Threatened and endangered species protection:** Higher scores are awarded when managers learn about, and if applicable, protect threatened and endangered species or their habitat on their farm/ranch.
- Wildlife Food, Cover and Water:** Consider ways to manage production areas to benefit wildlife, in addition to producing crops; provide functioning buffers near water bodies.
- Linking individual wildlife habitat conservation activities together:** Recognition is given to managers who work with nearby landowners, and/or as a part of regional plans designed to create the greatest habitat value possible for wildlife and T&E species.

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Large urban areas present a different type of landscape ecology issue



How big is too big?



Urban planning are focused on creating more pleasant places to live:

- Domestic water supply
- Transportation and parking
- Storm-water runoff
- Greenways
- Parks
- Wildlife and natural habitat in urban environments

What are some critical processes on which urban areas should focus?

Can landscape ecology help in this consideration?

## Integrating Humans into Ecology: Opportunities and Challenges for Studying Urban Ecosystems

MARINA ALBERTI, JOHN M. MARZLUFF, ERIC SHULENBERGER, GORDON BRADLEY,  
CLARE RYAN, AND CRAIG ZUMBRUNNEN

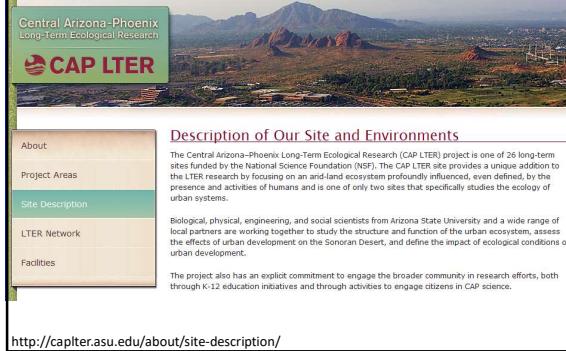
Alberti et al. 2003. BioScience 53:1169-1179

## Questions for Urban Ecologists

- How do socioeconomic and biophysical variables influence the spatial and temporal distribution of human activities in human-dominated ecosystems?
- How human activities redistribute energy and material and modify disturbance regimes?
- How do human populations and activities interact with processes at the levels of the individual (birth, death, dispersal), the population (speciation, extinction, cultural or genetic adaptation), and the community (compensation, predation, mutualism, parasitism) to determine the resilience of the human-dominated system?
- How do humans respond to changes in ecological conditions, and how do these responses vary regionally and culturally?

Alberti et al. 2003. BioScience 53:1169-1179

## Central Arizona-Phoenix Long-term Ecological Research Site (NSF)



The screenshot shows the CAP LTER website's "Site Description" page. The page features a large image of the Phoenix skyline and surrounding desert landscape. A sidebar on the left lists navigation links: About, Project Areas, Site Description (which is highlighted in green), LTER Network, and Facilities.

**Description of Our Site and Environments**

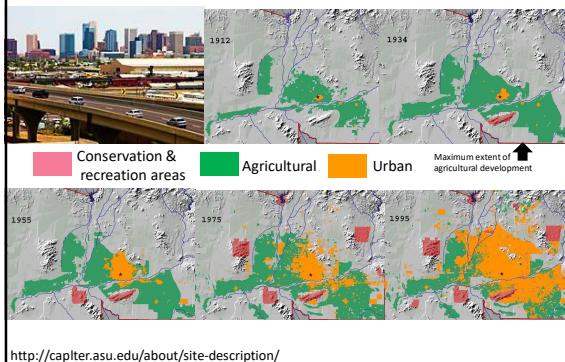
The Central Arizona-Phoenix Long-Term Ecological Research (CAP LTER) project is one of 26 long-term sites funded by the National Science Foundation (NSF). The CAP LTER site provides a unique addition to the LTER research by focusing on an arid-land ecosystem profoundly influenced, even defined, by the presence and activities of humans and is one of only two sites that specifically studies the ecology of urban systems.

Biological, physical, engineering, and social scientists from Arizona State University and a wide range of local partners are working together to study the structure and function of the urban ecosystem, assess the effects of urban development on the Sonoran Desert, and define the impact of ecological conditions on urban development.

The project also has an explicit commitment to engage the broader community in research efforts, both through K-12 education initiatives and through activities to engage citizens in CAP science.

<http://caplter.asu.edu/about/site-description/>

## Growth of Phoenix, Arizona- 1912-1995



## Project Emphasis Areas

### Biogeochemical Patterns, Processes, and Human Outcomes

Energy flow and material cycling in ecosystems are processes that support ecosystem services; they are often hidden from human perception and inadvertently managed.

### Human Decisions and Biodiversity: Populations, Food Webs, and Organisms Interactions with Humans

How do human activities, behaviors, and values change biodiversity and its components (population abundance; species distribution and richness; community and trophic structure)?

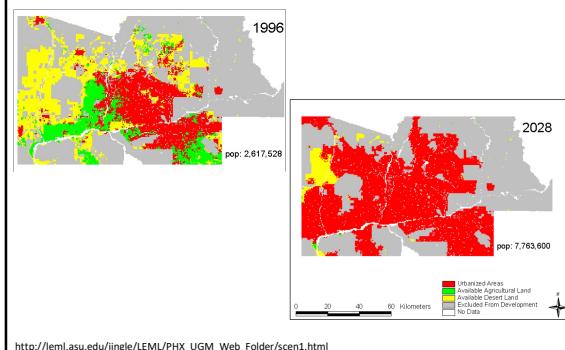
### Climate, Ecosystems, and People

Our central goal is to understand interactions among urban climate, ecosystems, and social systems in the Phoenix metropolitan region.

### Water Dynamics in a Desert City

How does the management of urban water systems in cities affect feedbacks and tradeoffs among water-related ecosystem services, and how will climate change and uncertainty affect these tradeoffs?

## Modeled growth scenarios



Many of the same processes that occur in 'natural' landscapes also occur in human-dominated landscapes.

