

# Texas Master Naturalists Milam County

Herpetology Class Training  
22 Nov 2013

# Curriculum

- Become familiar with and recognize the common characteristics of amphibians and reptiles and how they differ from other vertebrates
- Become familiar with and recognize and explain the principle causes of biodiversity loss
- Become familiar with and be able to explain the herpetological conservation topics relevant to Texas
- Outline and communicate the issues affecting the conservation of Texas herpetofauna
- Become familiar with the natural history and diversity of amphibians and reptiles in Texas

# Herpetology

- **Herpetology** (from Greek: ἑρπετόν, *herpeton*, "creeping animal" and λόγος, *logos*, "knowledge")
- Amphibians
  - Anura
  - Caudata
  - Gymnophiona
- Reptiles
  - Testudines
  - Sphenodontida
  - Crocodylia
  - Squamata

# Biodiversity Loss

- Habitat destruction
- Invasive species
- Global climate change
- Pathogens
- Commercial collection



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Chytrid fungus, *Batrachochytrium dendrobatidis*

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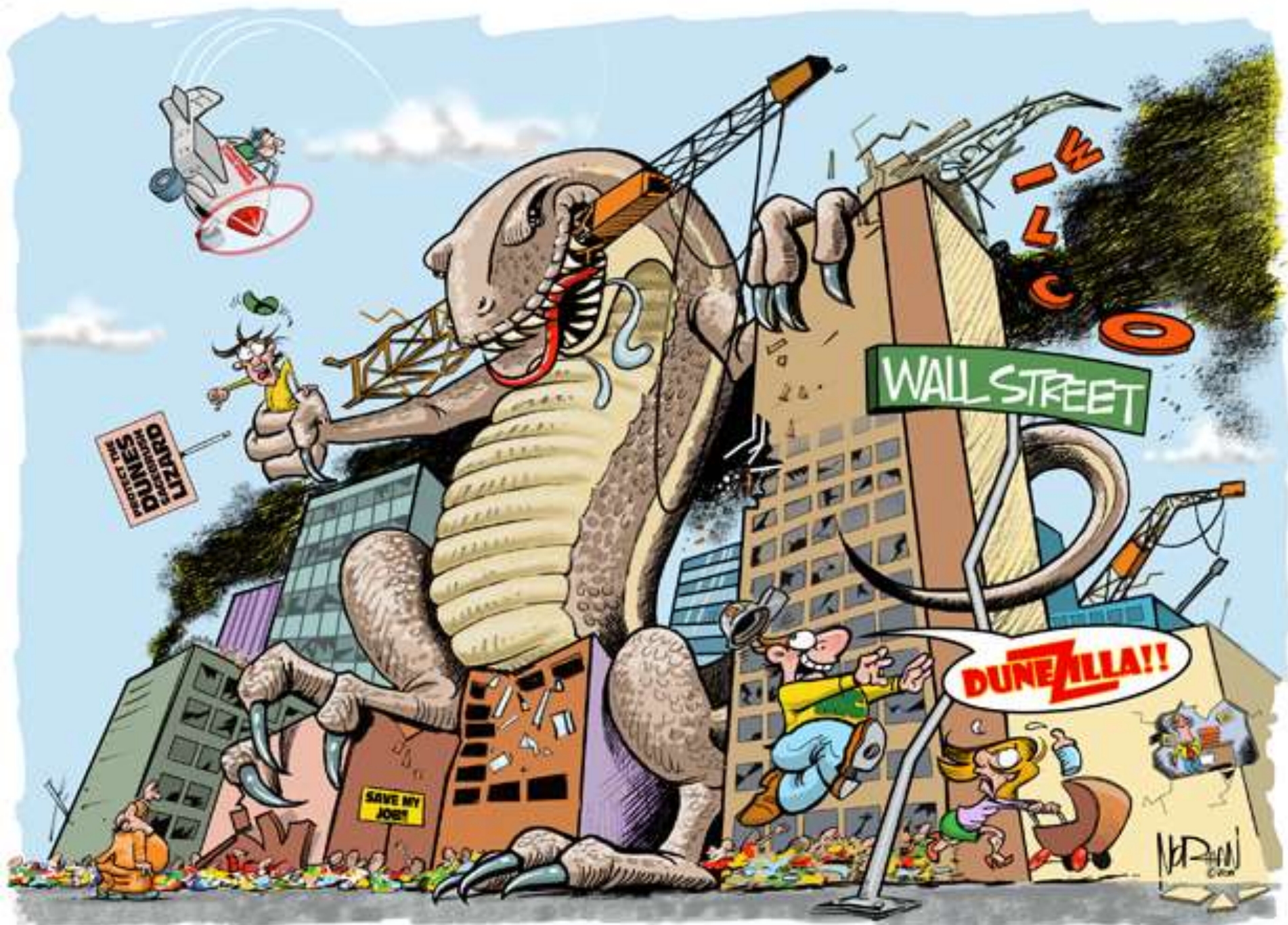
E. Bennett/WCS

Turtles spilling out of a burlap bag are evidence of the turtle trade in Asia.

# Texas Herp Conservation

- Houston Toad
- Spring Salamanders
  - San Marcos Salamander
  - Barton Springs Salamander
  - Austin Blind Salamander
  - Texas Blind Salamander
  - Jollyville Plateau Salamander
    - Salado Salamander
    - Georgetown Salamander
- Black-spotted Newt
- <http://www.texasahead.org/texasfirst/species/>







# The Global Decline of Reptiles, Déjà Vu Amphibians

J. WHITFIELD GIBBONS, DAVID E. SCOTT, TRAVIS J. RYAN, KURT A. BUHLMANN, TRACEY D. TUBERVILLE, BRIAN S. METTS, JUDITH L. GREENE, TONY MILLS, YALE LEIDEN, SEAN POPPY, AND CHRISTOPHER T. WINNE



**A**s a group [reptiles] are neither 'good' nor 'bad,' but are interesting and unusual, although of minor importance. If they should all disappear, it would not make much difference one way or the other" (Zim and Smith 1953, p. 9). Fortunately, this opinion from the Golden Guide Series does not persist today: most people have come to recognize the value of both reptiles and amphibians as an integral part of natural ecosystems and as heralds of environmental quality (Gibbons and Stangel 1999). In recent years, as overall environmental awareness among the public has increased, concerns have come to include interest in the ecological state of reptile and amphibian species themselves and of their habitats. Increased awareness may stem from better education about threats to biodiversity in general, and to reptiles and amphibians in particular, and possibly even from an innate attraction to these taxa (Kellert and Wilson 1993).

From the perspective of many nonscientists, the two vertebrate classes comprising reptiles and amphibians, collectively referred to as the herpetofauna, are interchangeable. For example, the Boy Scout merit badge pamphlet for herpetology was called simply *Reptile Study* from 1926 to 1993 (Conant 1972, Gibbons 1993), and major zoos (e.g., National Zoo in Washington, DC; Zoo Atlanta; and San Diego Zoo) use only the name "reptile" to refer to the facility that houses both amphibians and reptiles. Thus, public attitudes about the need for conservation of reptiles are probably linked to concern about amphibian declines and deformities (Alford and Richards 1999, Johnson et al. 1999, Sessions et al. 1999), which have been the subject of numerous, well-documented scientific studies.

Because amphibians are distributed worldwide, but herpetologists who document amphibian declines are not, it is difficult to accurately assess what portion of amphibian populations are experiencing significant declines or have already disappeared. Furthermore, the means of determining a species' conservation status is a rigorous and time-intensive process, and therefore counts of "officially" recognized endangered and threatened species are likely to grossly underestimate the actual number of imperiled species (Table 1). The worldwide amphibian decline

REPTILE SPECIES ARE DECLINING ON A GLOBAL SCALE. SIX SIGNIFICANT THREATS TO REPTILE POPULATIONS ARE HABITAT LOSS AND DEGRADATION, INTRODUCED INVASIVE SPECIES, ENVIRONMENTAL POLLUTION, DISEASE, UNSUSTAINABLE USE, AND GLOBAL CLIMATE CHANGE

problem, as it has come to be known, has garnered significant attention not only among scientists but also in the popular media and in political circles.

## The reptile problem

Despite the fact that reptiles and amphibians are often considered collectively, reptile declines deserve spotlighting and elucidating in their own right. The differences between the two groups are substantial. Modern amphibians and reptiles are products of independent lineages that have been separate for the past 300 million years (Pough et al. 1998). Many of the differences between the groups are obvious and considerable. For example, the integument of reptiles is covered with scales, whereas amphibians have a highly permeable, glandular skin, a feature often touted as enhancing the environmental sensitivity of amphibians to

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# Endangered Species in Texas

- Green Sea Turtle
- Hawksbill Sea Turtle
- Kemp's Ridley Sea Turtle
- Loggerhead Sea Turtle (not the Gulf pop)
- Leatherback Sea Turtle

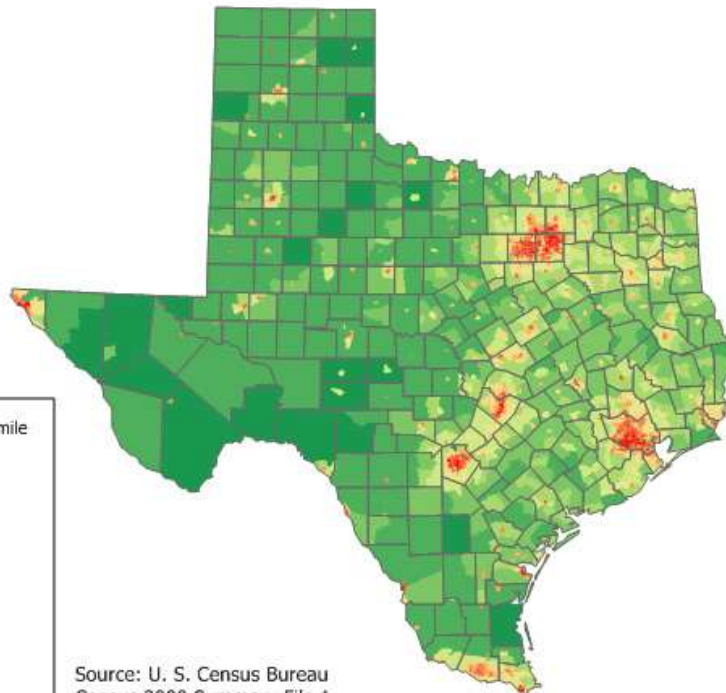
All the above listed in 1970's

- Concho Water Snake
  - Listed in 1986
  - Delisted 2011
- American Alligator – delisted in Texas in 1983 (1987 throughout range)

# Changes in Texas

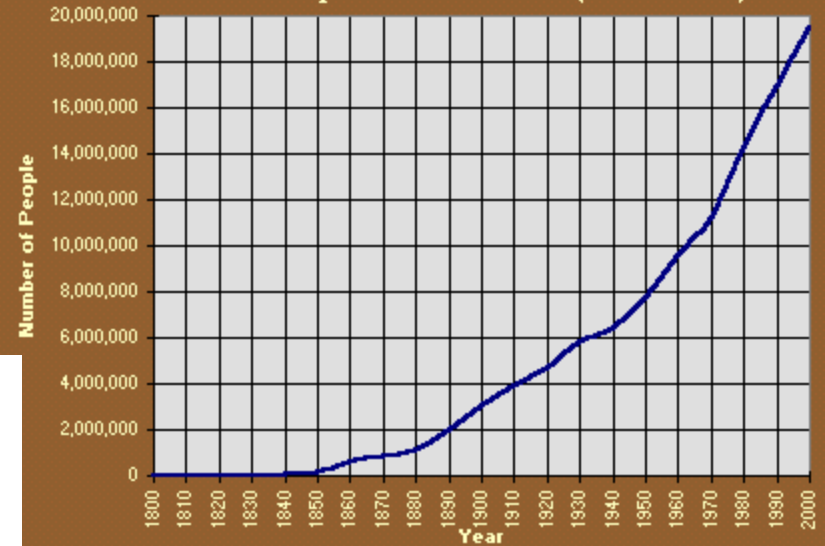
1980 – 14 million

2010 – 25 million



Source: U. S. Census Bureau  
Census 2000 Summary File 1  
population by census tract.

Chart A: Population of Texas (1800-2000)



# 118 species with recent federal changes



- Center for Biological Diversity vs Salazar lawsuit to get USFWS to make a decision on 757 US species
- 8 Texas reptiles were affected by this decision
- Western Chicken Turtle
  - Alligator Snapping Turtle
  - Rio Grande Cooter
  - Spot-tailed Earless Lizard
  - Reticulated Collared Lizard
  - Dunes Sagebrush Lizard
  - Louisiana Pine Snake
  - Desert Massasauga







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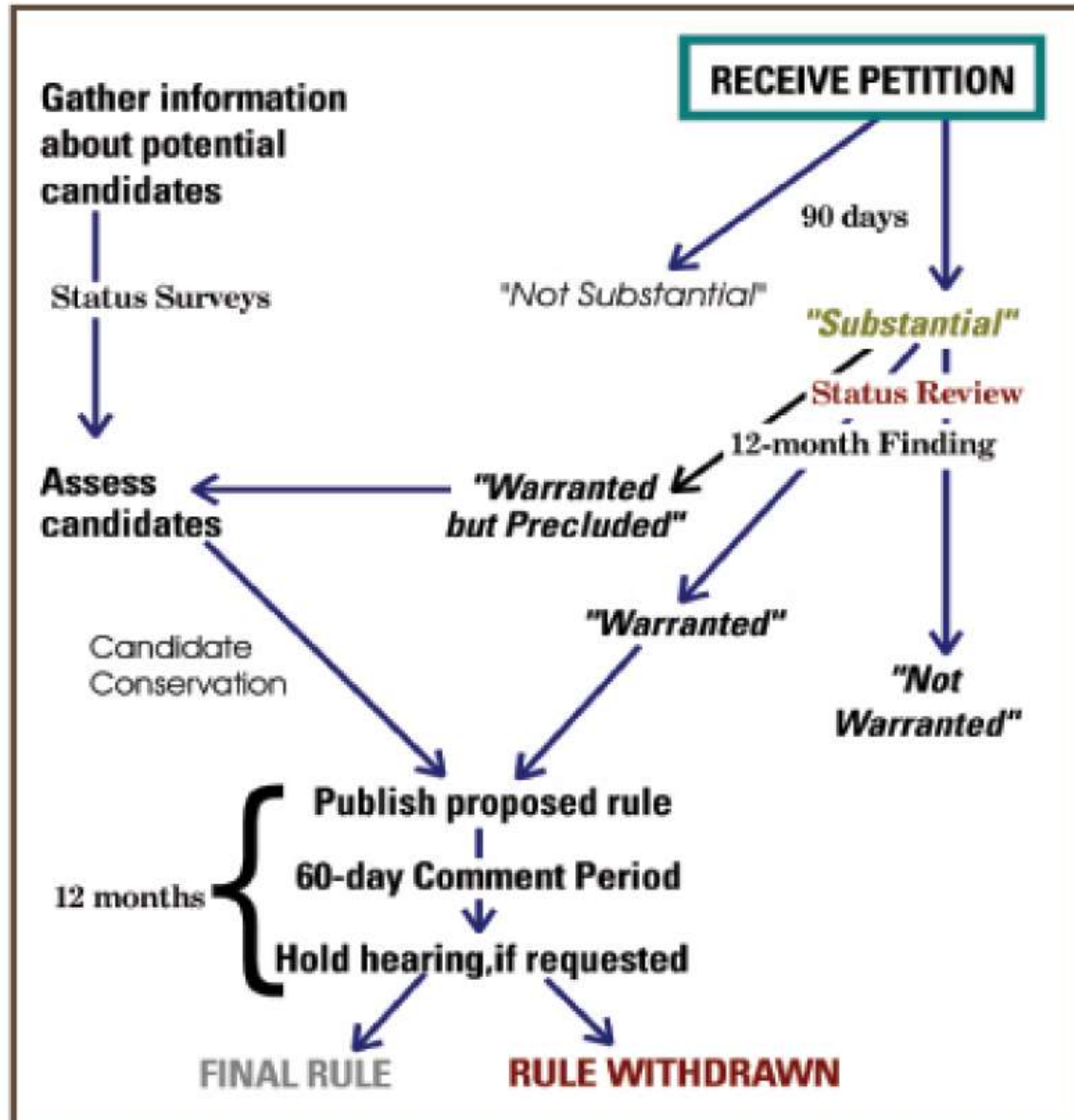






# The Process

Anyone can submit a petition for listing but it must be backed with scientific data.



# Texas Reptiles

- Proposed for listing
  - Louisiana Pine Snake
- Under 12 month status review
  - Desert Massasauga
  - Spot-tailed Earless Lizard
  - Western Chicken Turtle
- Under 90 day status review
  - Alligator Snapping Turtle
  - Reticulated Collared Lizard
  - Rio Grande Cooter
- Proposed but found to be not warranted
  - Dunes Sagebrush Lizard
- Delisted
  - Concho Water Snake





# Louisiana Pine Snake





# LPS listing history

- First appears on federal register 1982
- Most recent decision is “warranted but precluded” Candidate 5





# What is being done for LPS

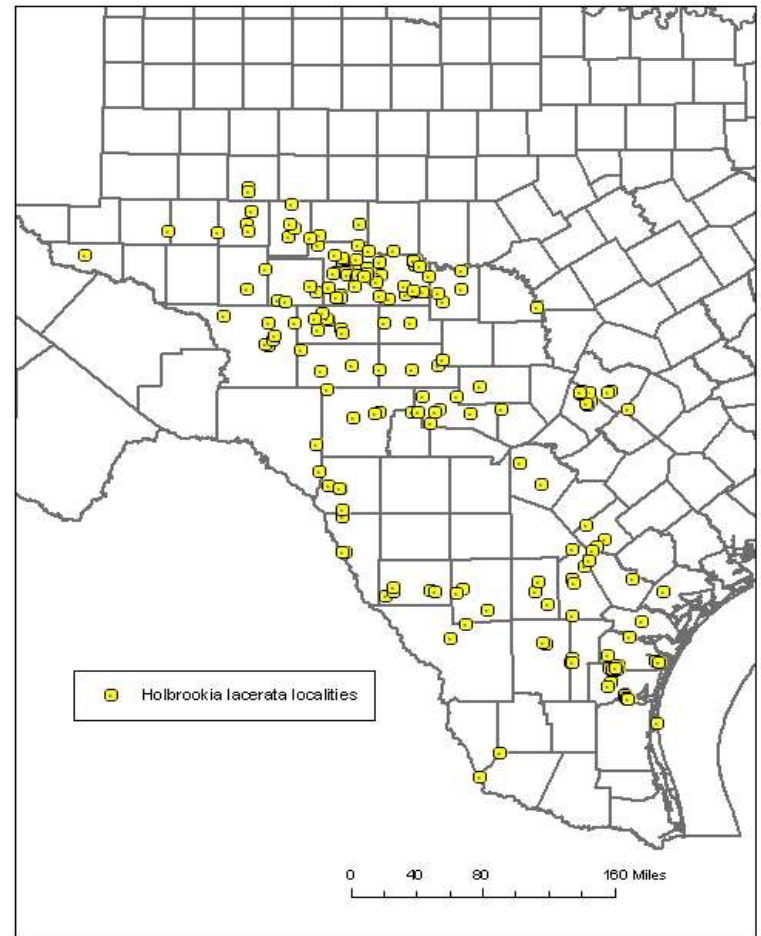
- Captive breeding and reintroduction program
- Continued trapping in known Texas localities
  - 6 individuals found at 2 localities since 2006
- Large trapping effort in 90's found 3 populations in TX
- Benefits from management for RCW
- CCA

# Spot-tailed Earless Lizard



# Current status

- Confirmed at 12 sites during 2 year study (Duran)
- Extremely rare south of Edwards plateau
- iNaturalist record
- <http://www.inaturalist.org/observations/133043#comment-30171>





# Threats

- Invasive grasses such as Buffleggrass
- Roads
- Agriculture





# Concho Water Snake



# CWS history

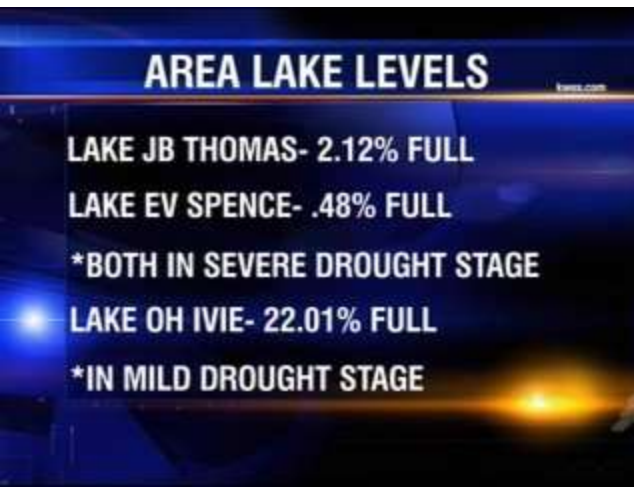
- Listed in 1986 as federally threatened
- Main threat was damming of Concho and Colorado Rivers
- Extensive studies by Dixon et al.
- Delisting effort started by CRMWD
- Delisted in 2011





# CWS delisting

- Is the snake recovered?
  - How is the snake handling the drought?
  - Why has the Brazos Water Snake pops crashed and could it happen to Concho?





# Dunes Sagebrush Lizard



# DSL listing history

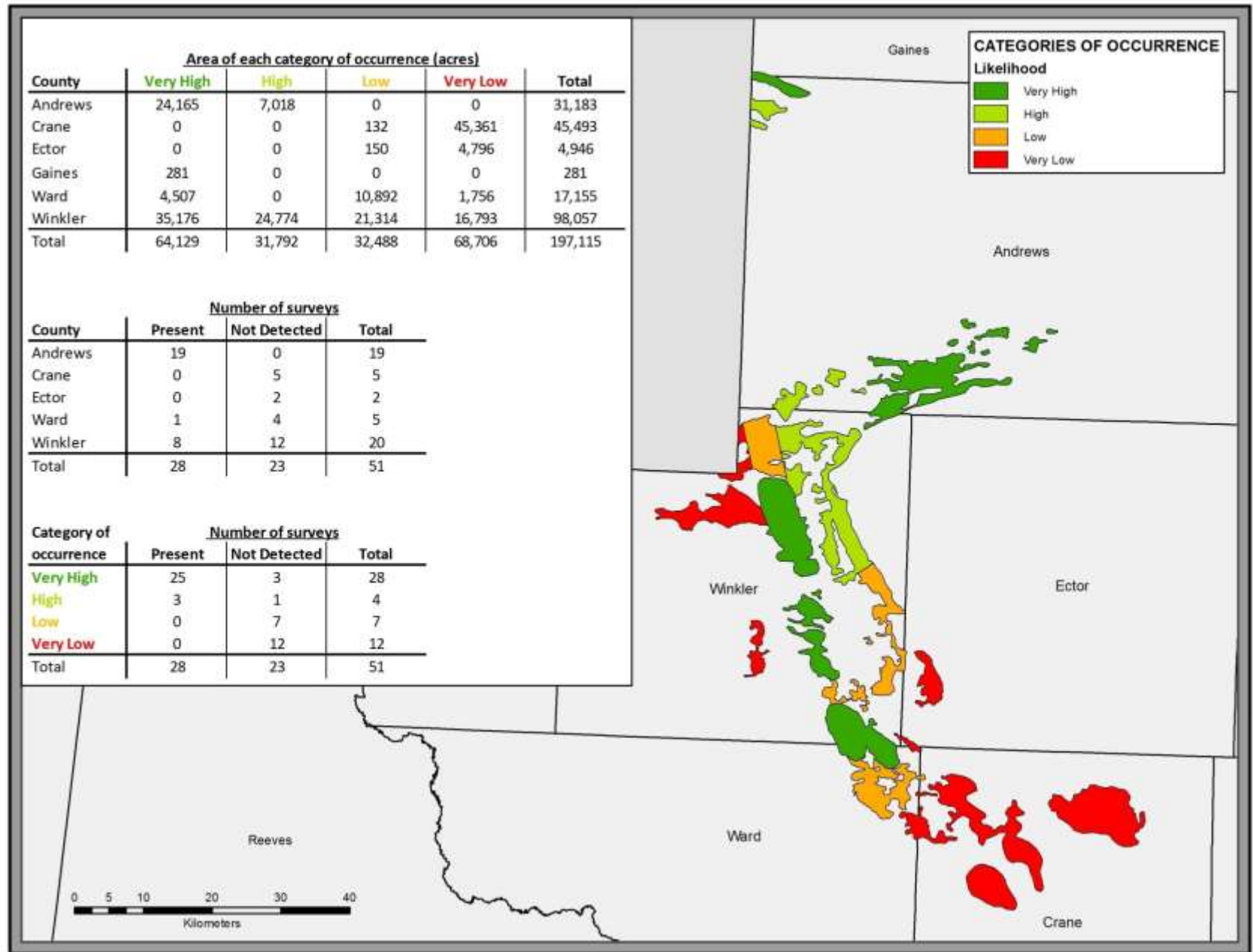
- 1982 first listed as under review
- 2004 12 month finding as candidate 2 warranted but precluded
- Proposed rule Dec 2010
- Determined to be adequately protected in both states June 2012

# DSL -CCAA

- New Mexico and Texas have separate Candidate Conservation Agreements with Assurances
- Agreements generate funds for research, mitigation, and conservation.



# DSL distribution





# DSL threats

- Habitat Loss is the only imminent threat
- Currently habitat loss is associated with two things
  - Removal of shinnery oak with herbicide
  - Oil and Gas activities



1/28/1996

Kermitt Hwy

115

N

Image U.S. Geological Survey  
© 2012 Google

Google earth

Imagery Date: 1/14/1996

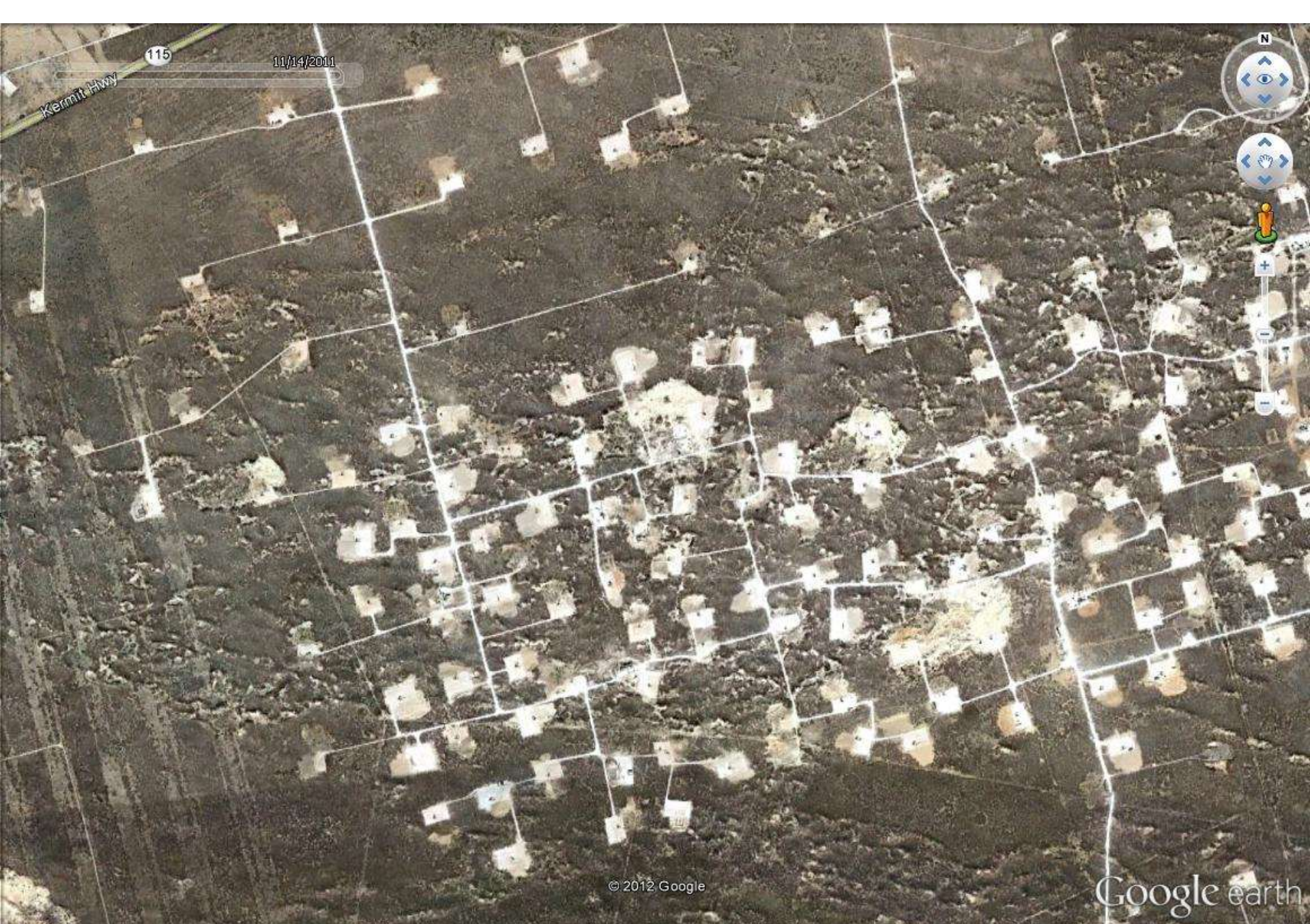


1996

lat 32.152698° lon -102.773689° elev 3325 ft

Eye alt 16132 ft





115


11/14/2011

Kermit Hwy



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Google earth

Imagery Date: 11/14/2011  1996

lat 32.152132° lon -102.770564° elev 3321 ft

Eye alt 15677 ft 



# What other reptiles and amphibians are declining?

- Many members of this group can identify species in the state that were once perceived to be more common
  - Texas Garter Snake
  - Prairie Skink
  - Texas Horned Lizard
  - Strecker's Chorus Frog
  - Crawfish Frog
- How do we fix the problem??



# Programs for citizen scientists

- [http://www.tpwd.state.tx.us/learning/texas\\_nature\\_trackers/](http://www.tpwd.state.tx.us/learning/texas_nature_trackers/)
- Texas Amphibian Watch
- Texas Horned Lizard Watch
- Box Turtle Survey Project
- iNaturalist Herps of Texas  
<http://www.inaturalist.org/projects/herps-of-texas>

# Common Herps of the Brazos Valley













