

# Examples

Functional Realism



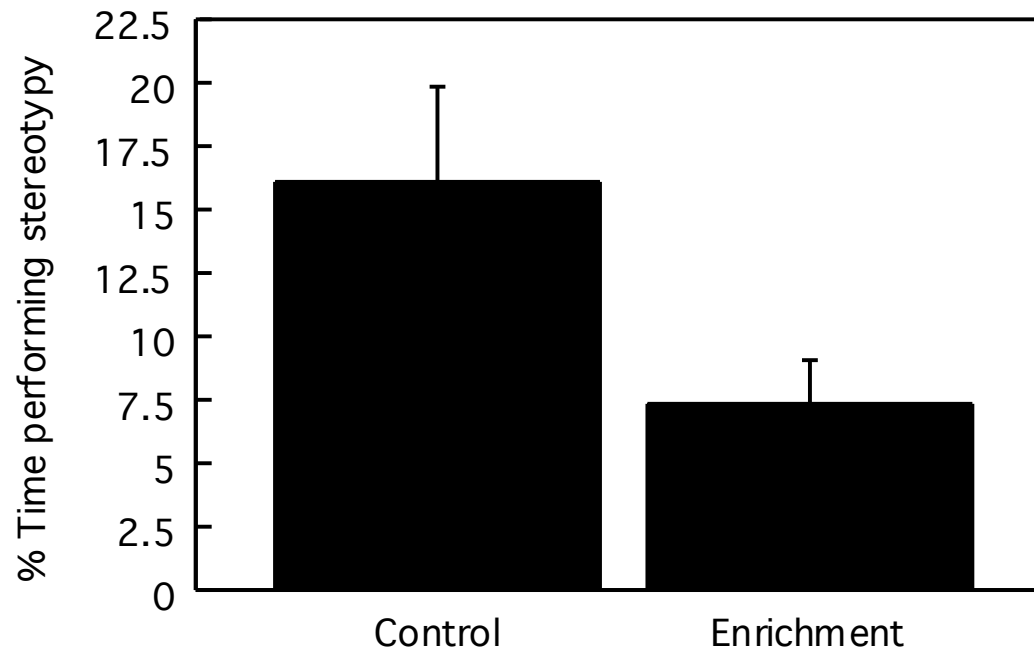
# Typical Goals of Enrichment

- Reduce abnormal behavior
- Reduce stress physiology
- Increase feeding behavior
- Increase exploration
- Increase range of natural behaviors
- Increase species specific behavior
- Increase use of space
- Increase activity
- Challenge



# How well does enrichment work?

## 50% reduction in stereotypy



ANOVA:  $F_{1,20}=20.6, P=0.0002$

From: Swaisgood, R. R., and Shepherdson, D. J. 2005. Scientific approaches to enrichment and stereotypies in zoo animals: What's been done and where should we go. *Zoo Biol.* 24: 499-518.

# Polar Bear Welfare

Video Study of 56 polar bears in 54 zoos over a 12 month period

Polar Bears pace less when given:

- More diverse enrichment
- Training
- Larger group size
- A view from their exhibit

Polar Bear Cortisol associated with:

- Less dry land area
- Pacing



Note: not all are “natural”

# Using Science to Understand Zoo Elephant Welfare

- 3-year scientific research study to better understand zoo elephant welfare
- \$800,000 leadership grant funded by the **Institute of Museum and Library Services**
- 70 North American, AZA-accredited zoos volunteered to collect data throughout 2012
- 255 elephants in the study, both African and Asian
- **2,500 hours of videotape of elephants assessed**
- 6,135 serum samples collected and analyzed
- 6,571 fecal samples collected from 40,000 pounds of elephant dung
- 12,655 samples tested and are now in a managed database
- 110,000 pages of elephant medical records assessed
- 3 universities represented with faculty involved in the study
- 27 researchers, including 19 PhDs, and zoo managers on the study team
- 5 graduate students and dozens of undergraduate students and **volunteers** contributed to the study



# Using Science to Understand Zoo Elephant Welfare

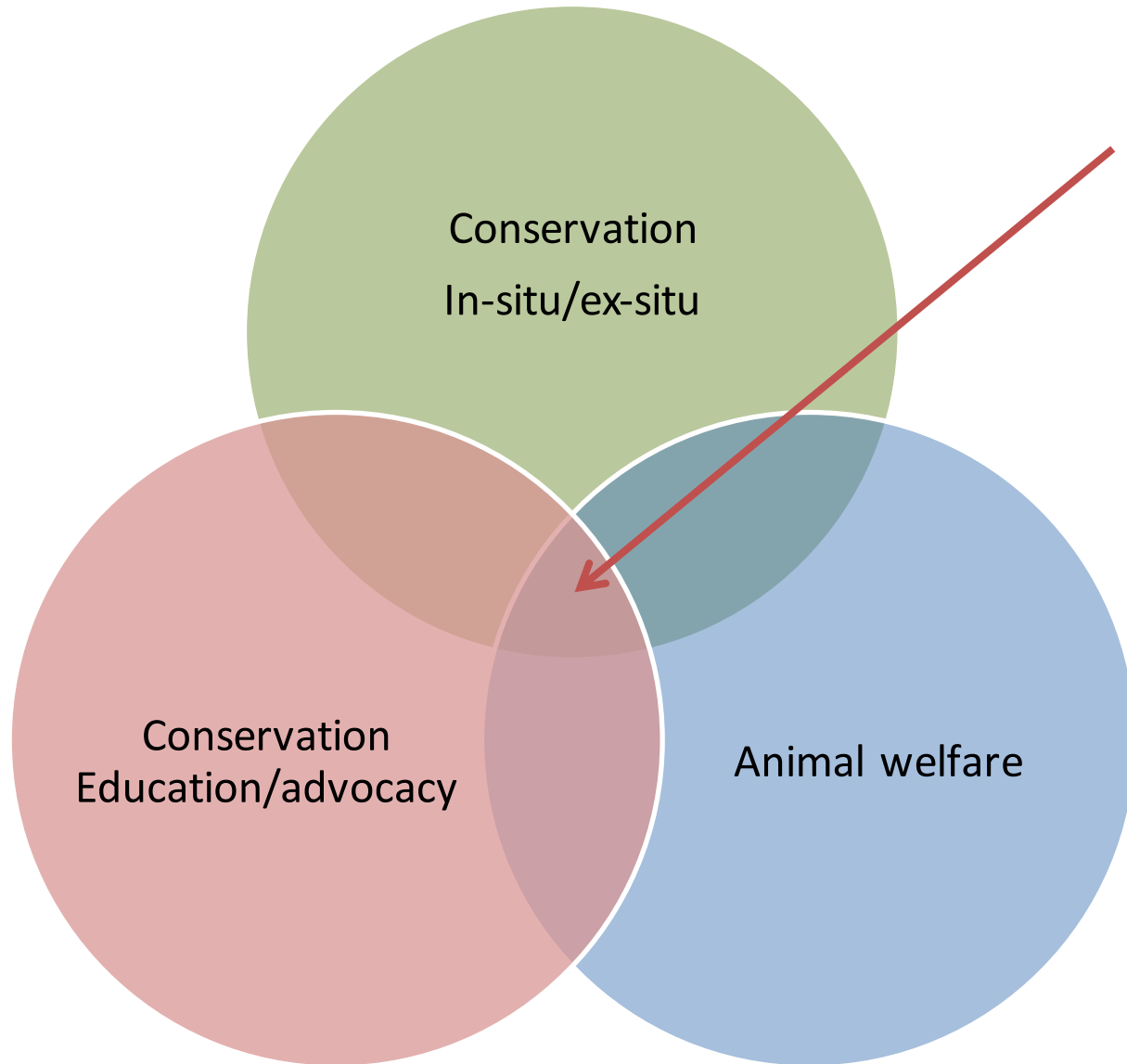
- Elephants lie down more when on soft substrates, in a variety of social groups, more time outside
- Stereotypic behavior is less when more space, more staff interaction, choice between in and out, strong social bonds, more time with young elephants
- Female elephants less likely to be acyclic with more enrichment, male elephants, more social experience & exercise programs, lower weight



Little comparable data from wild

# Nexus

# Zoos

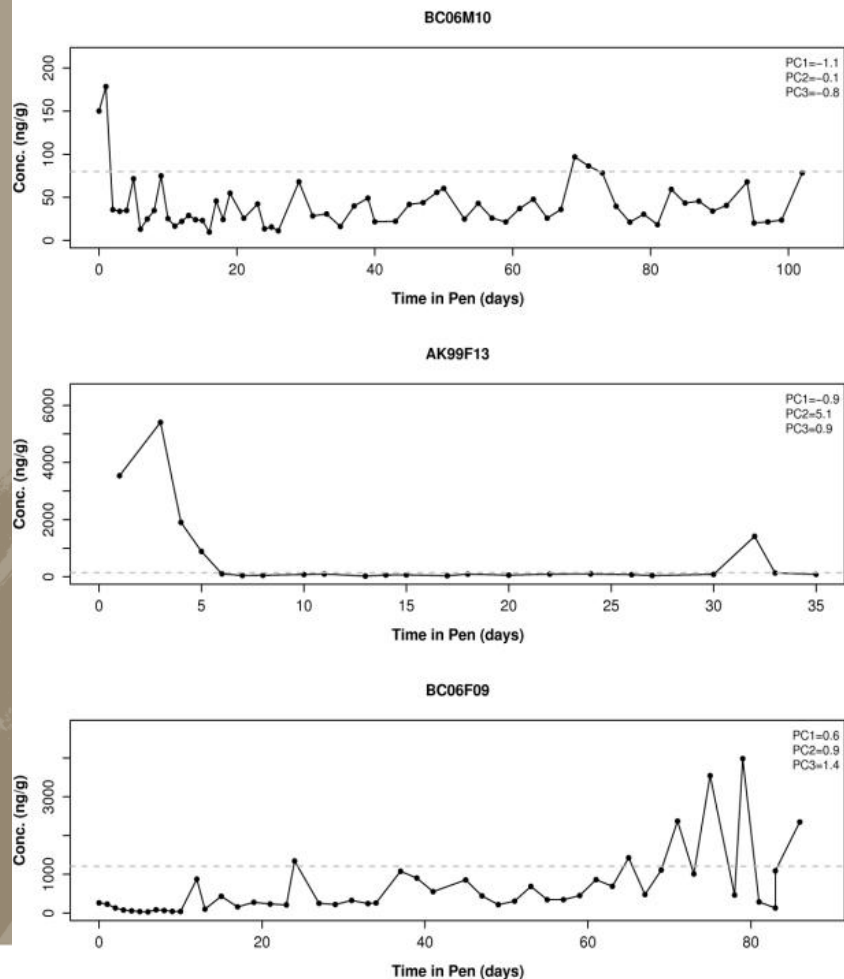


Conservation  
In-situ/ex-situ

Conservation  
Education/advocacy

Animal welfare

# Differences in Hormone Profiles of Wild Canada Lynx While in Holding Pens



Increased stress reactivity (i.e., variability of cort. profiles) while in holding pens was significantly correlated with lower post-release survivorship. (Fanson et al. submitted)





# Zoo Conservation Roles

- Animal welfare
- Species recovery
- Education/outreach - behavior change
- Science
- Citizen Science
- Funding
- Stimulate discussion and dissemination

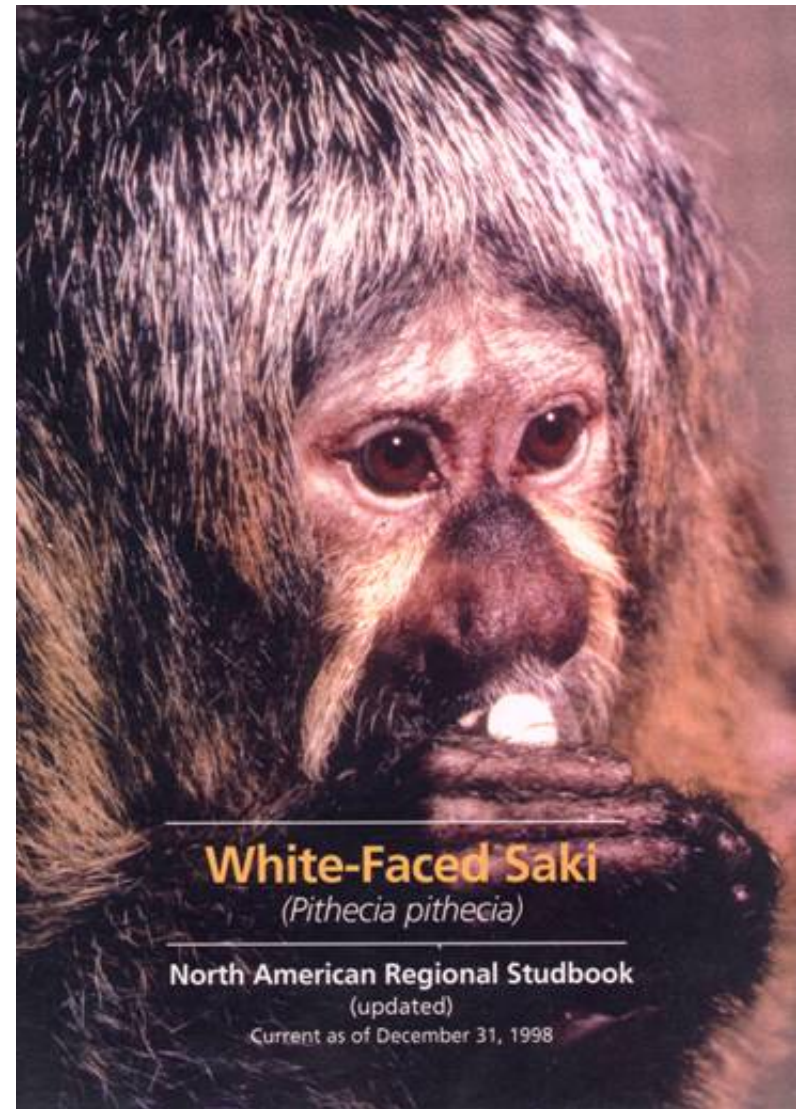
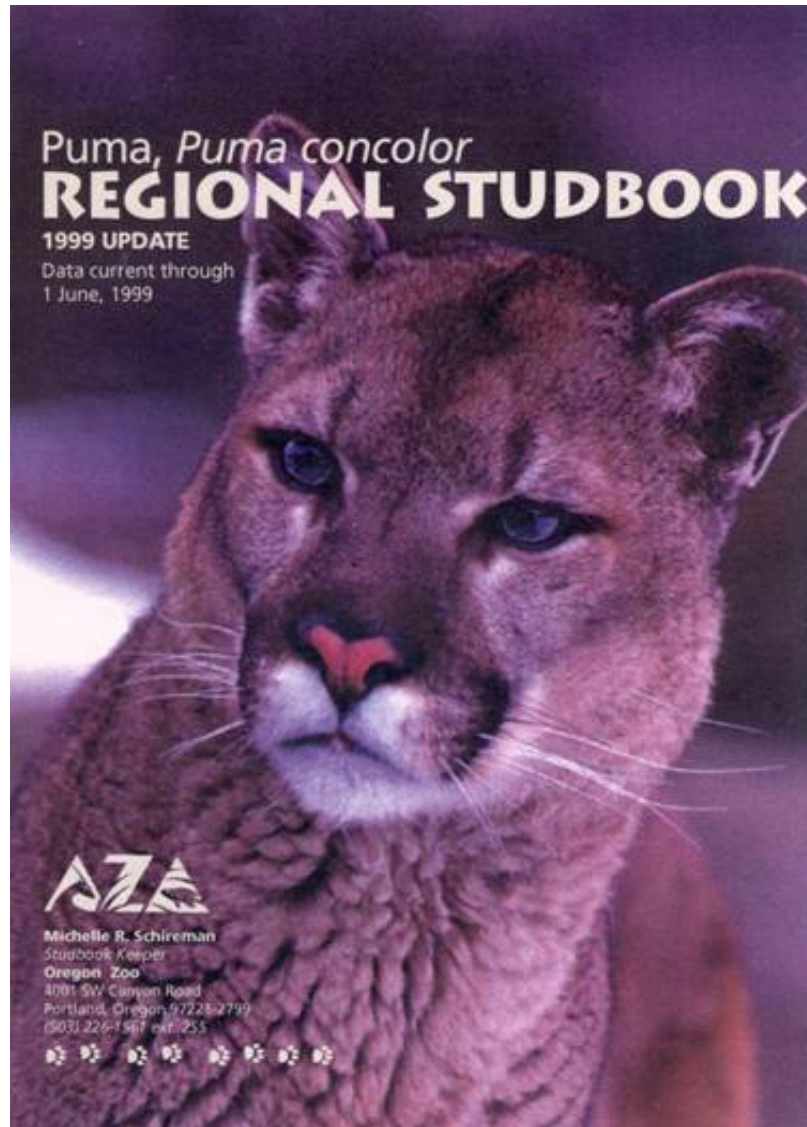


# Self Sustaining Populations of Endangered Species

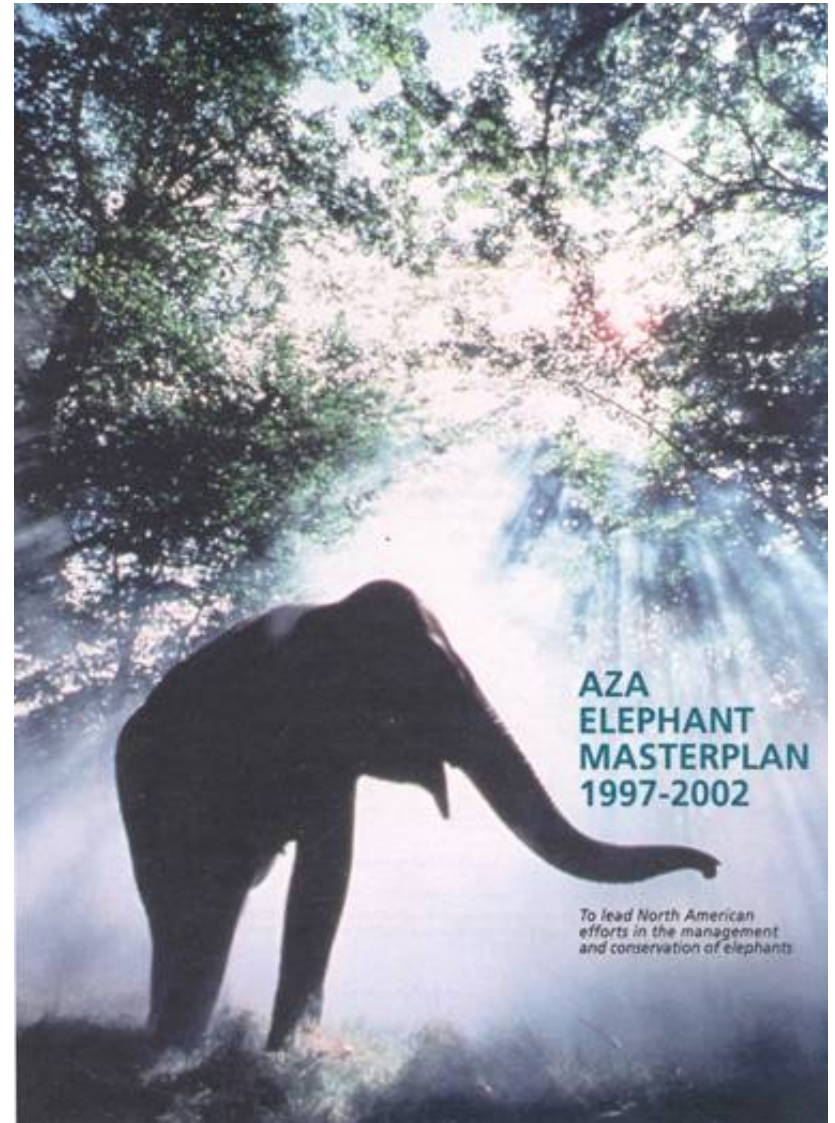
- Loss of Genetic Diversity
- Inbreeding Depression
- Genetic adaptation to captivity (domestication)



# Studbooks



# Species Survival Plans - SSP



**Global Zoo Breeding Programs**

# *Condors of the Columbia* opened in 2014



# Smart and social

*Condors are smart, curious and very social.*

## Condor coaches

Where do young condors learn good manners? From adult condors. Youngsters raised with mentors are more likely to succeed in condor society in the wild.

Condors are very intelligent and among the smartest birds. They learn by exploring and sharing. When they see something new, they check it out and others join in. Keeping condor smarts in mind contributes to the release program's success.

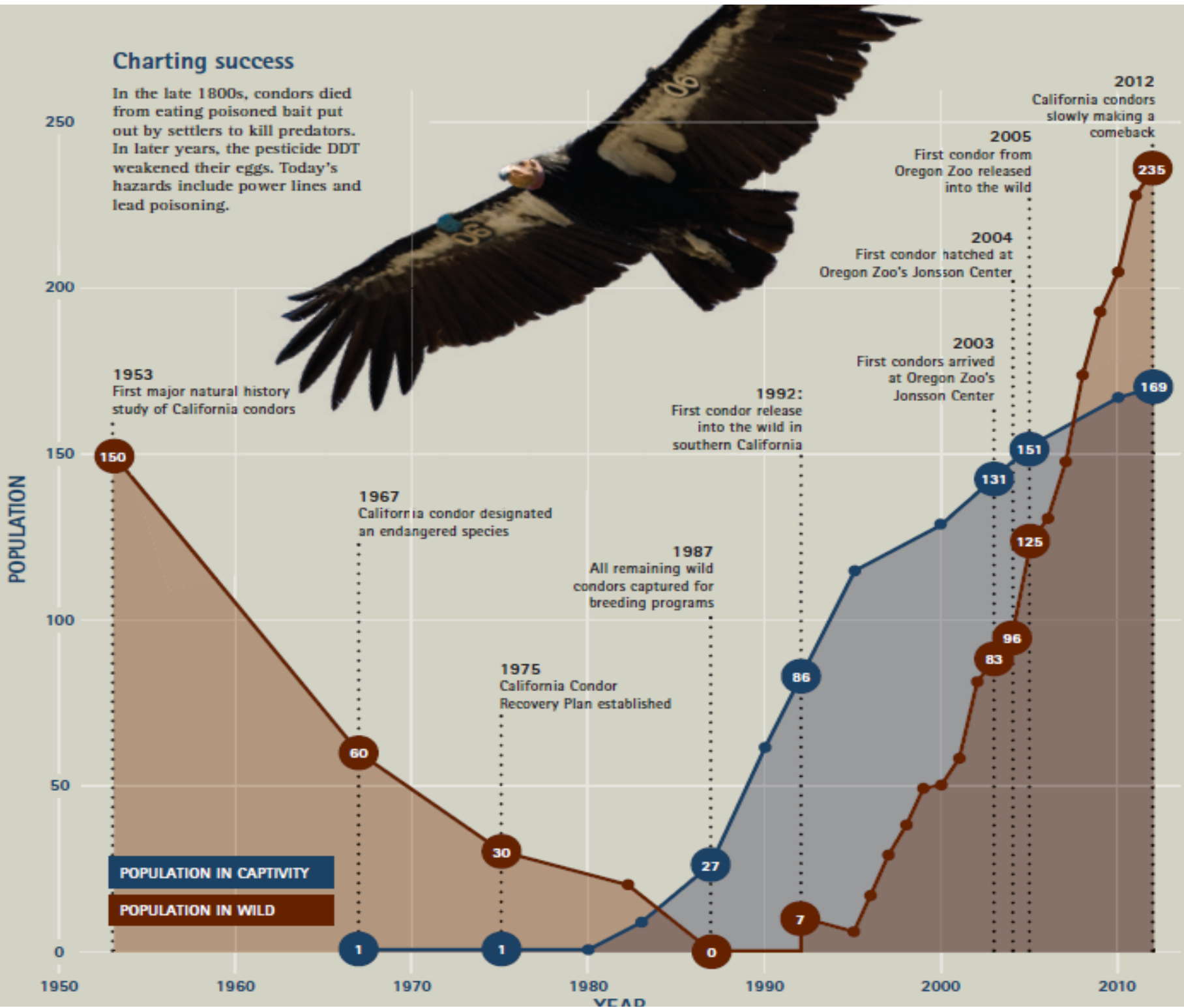


## Trained to survive


Power poles are deadly – an important lesson for young condors. Before release, we introduce the birds to a fake, slightly shocking, power pole. Their intelligence allows them to learn this lesson quickly and ~~they~~ remember it.

## Charting success

In the late 1800s, condors died from eating poisoned bait put out by settlers to kill predators. In later years, the pesticide DDT weakened their eggs. Today's hazards include power lines and lead poisoning.



# Challenges: lead ammunition



Lead bullet fragments in deer meat

## Get the lead out

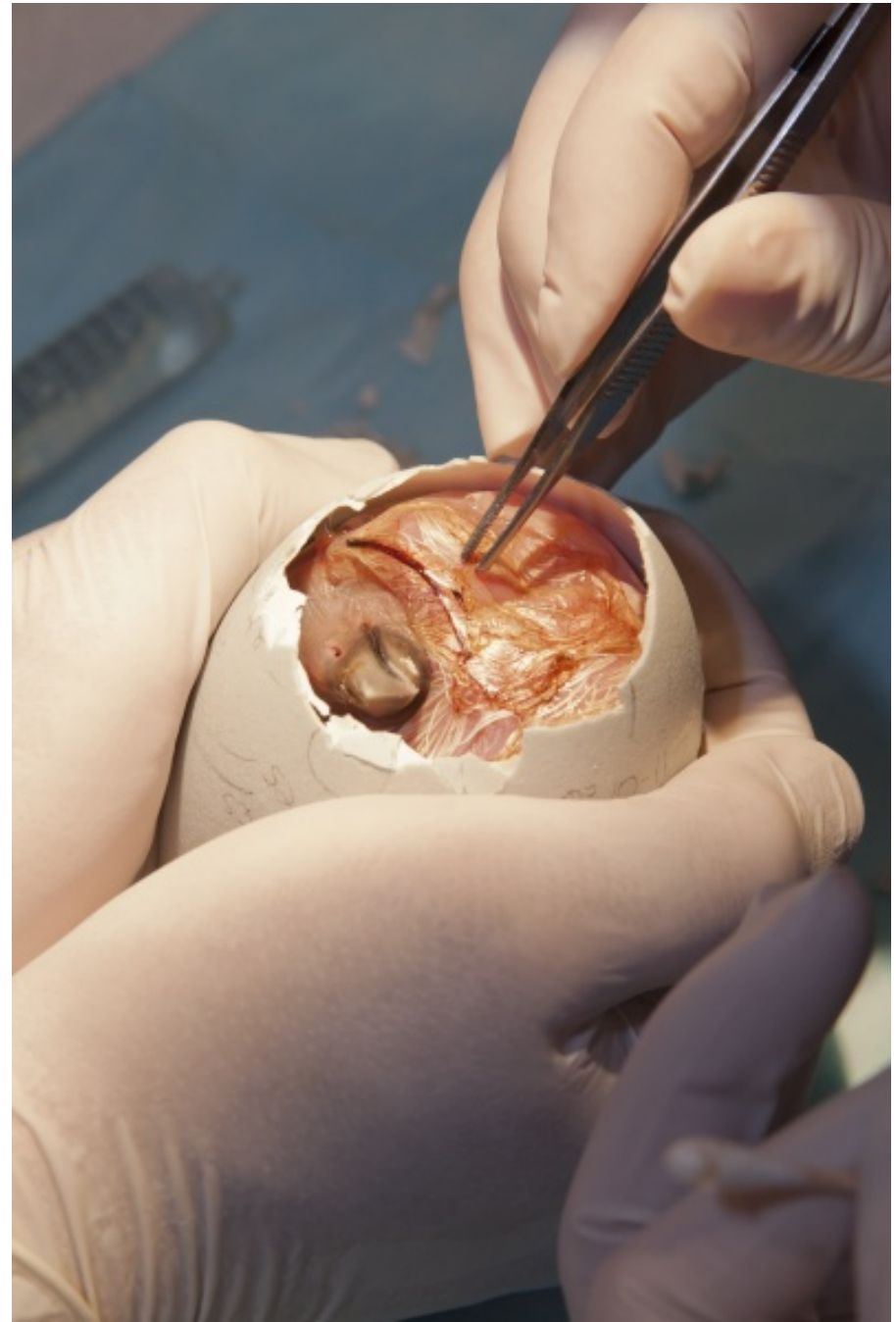
*Would you eat meat with lead in it?*

Condors eat dead things. Sometimes they eat animals that have been shot with lead bullets, which break into little pieces (fragments). Lead is toxic to condors, other scavengers such as eagles and bears, and people.

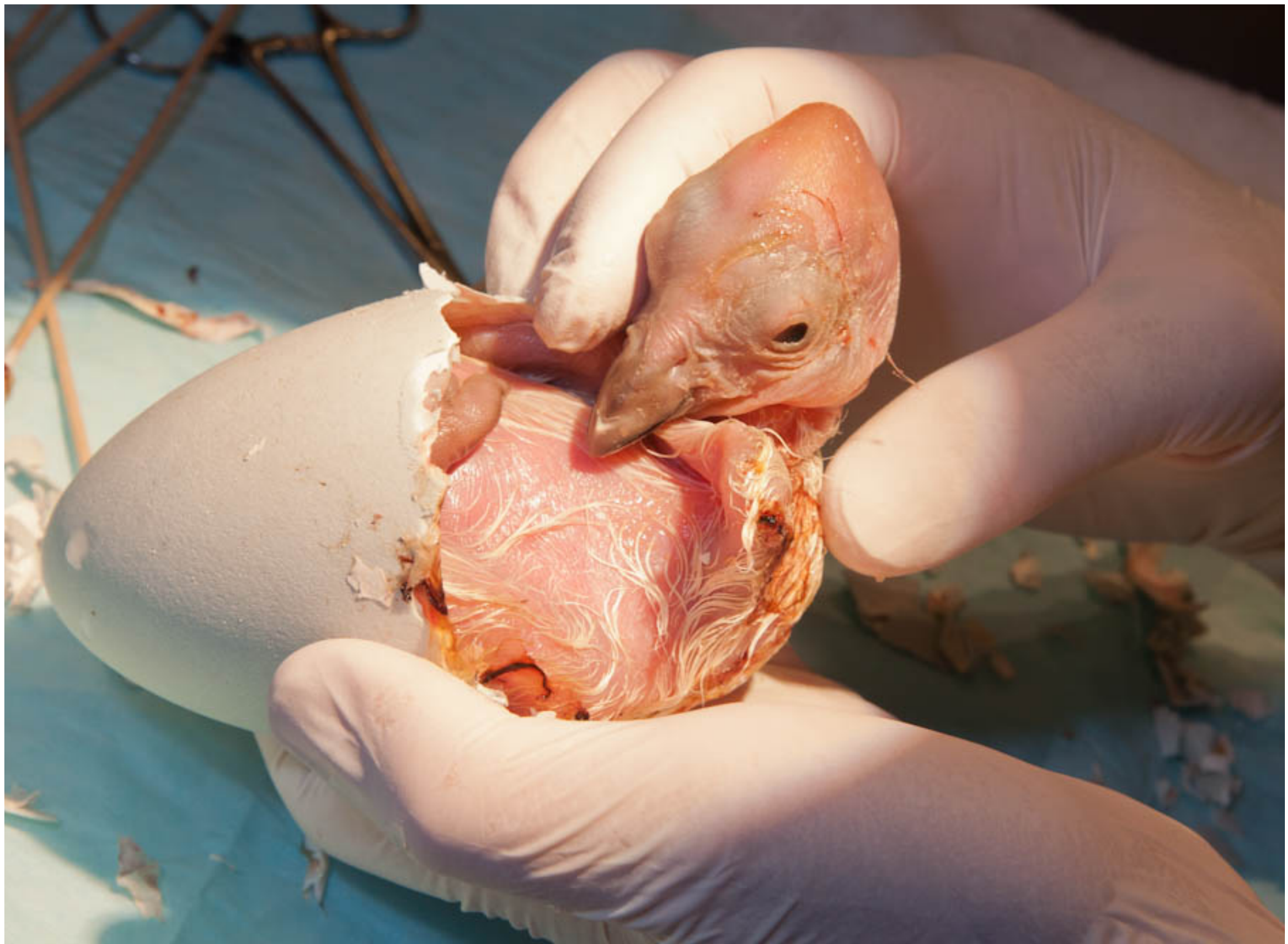
## Help condors: Make the switch

People are switching from lead to non-lead bullets, such as copper. Solid copper bullets aren't as toxic and don't break into fragments. With solid copper, scavengers like the condor aren't swallowing bits of lead when they eat.



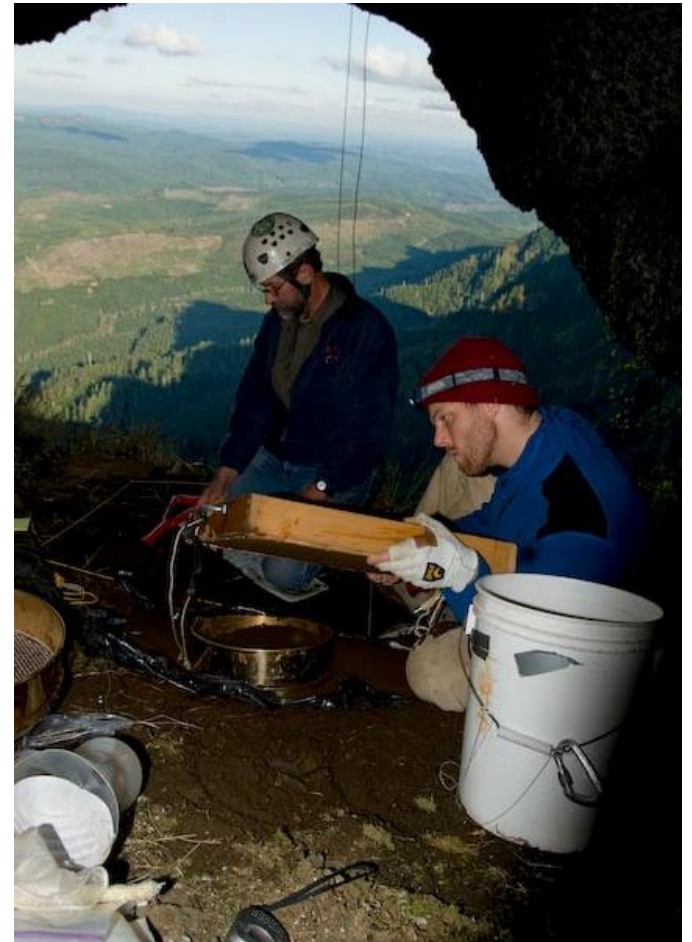


Senior keeper Kelli Walker shown assisting a hatch



# Condor research

- David Moen, Oregon Zoo/Americorps, Searching for ancient nest sites in Oregon

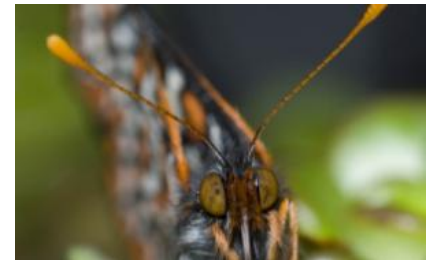


# Oregon Zoo Species Recovery Programs

Oregon Silverspot Butterfly



Taylor's Checkerspot Butterfly



Western Pond Turtle



# Zoo Conservation Roles

- Animal welfare
- Species recovery
- Education/outreach - behavior change
- Science
- Citizen Science
- Funding
- Stimulate discussion and dissemination



# Raising Silverspot Butterflies



# Releasing Silverspot Butterflies



Includes Education/Outreach - Behavioral change

# Western Pond Turtle Head Start program



Includes Education/Outreach - Behavioral change



# Turtle Community Release Event



Includes Education/Outreach - Behavioral change

# Zoo Conservation Roles

- Animal welfare
- Species recovery
- Education/outreach - behavior change
- Science
- Citizen Science
- Funding
- Stimulate discussion and dissemination



# Oregon Zoo Species Recovery Programs

Oregon Spotted Frog



Pygmy Rabbit



# Behavior Studies Improve Reproduction



Role of mate  
preference in  
reproductive  
success

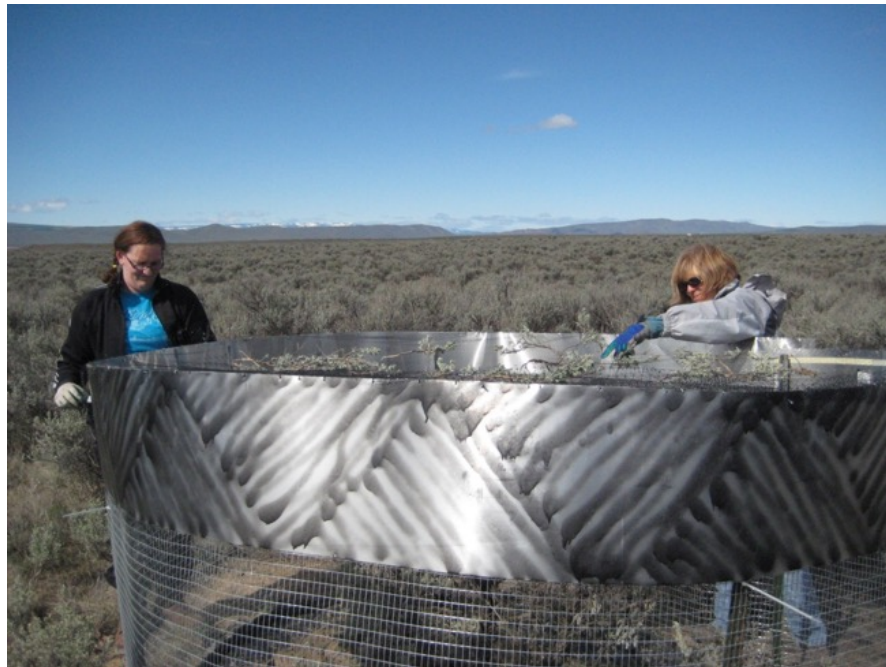


Martin, M. and D. Shepherdson (2012). "The role of familiarity and preference on reproductive success in ex-situ conservation breeding programs." Conservation Biology **26(4)**.

# Captive Work



# Field Work



# Behavior Studies Improve Reproduction



Role of mate  
preference in  
reproductive  
success



Martin, M. and D. Shepherdson (2012). "The role of familiarity and preference on reproductive success in ex-situ conservation breeding programs." Conservation Biology **26(4)**.

# Field Research can benefit from research on zoo animals

- Testing techniques
- Diet energetic studies
- Baseline values
- Disease
- Basic Biology



# Understanding Bull Frog Predation

- Are there population level differences in behavior between frogs from habitat with and without bullfrogs?

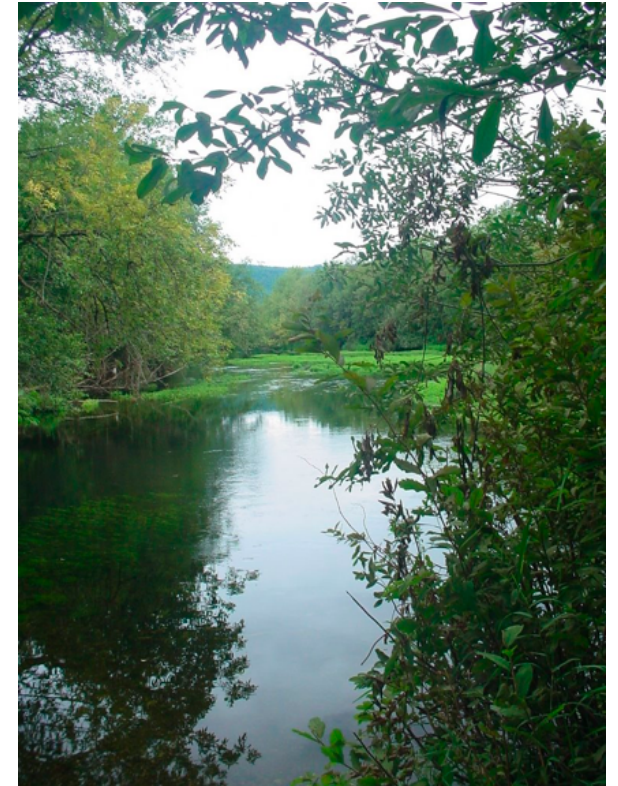


Oregon Spotted Frog



Conboy Lake

Bull frogs



Black River

no Bull frogs

Tidwell, K. S., D. J. Shepherdson and M. Hayes (2013). "Inter-population Variability in Evasive Behavior in the Oregon Spotted Frog (*Rana pretiosa*)."  
*Journal of Herpetology* **47(1): 93-96.**

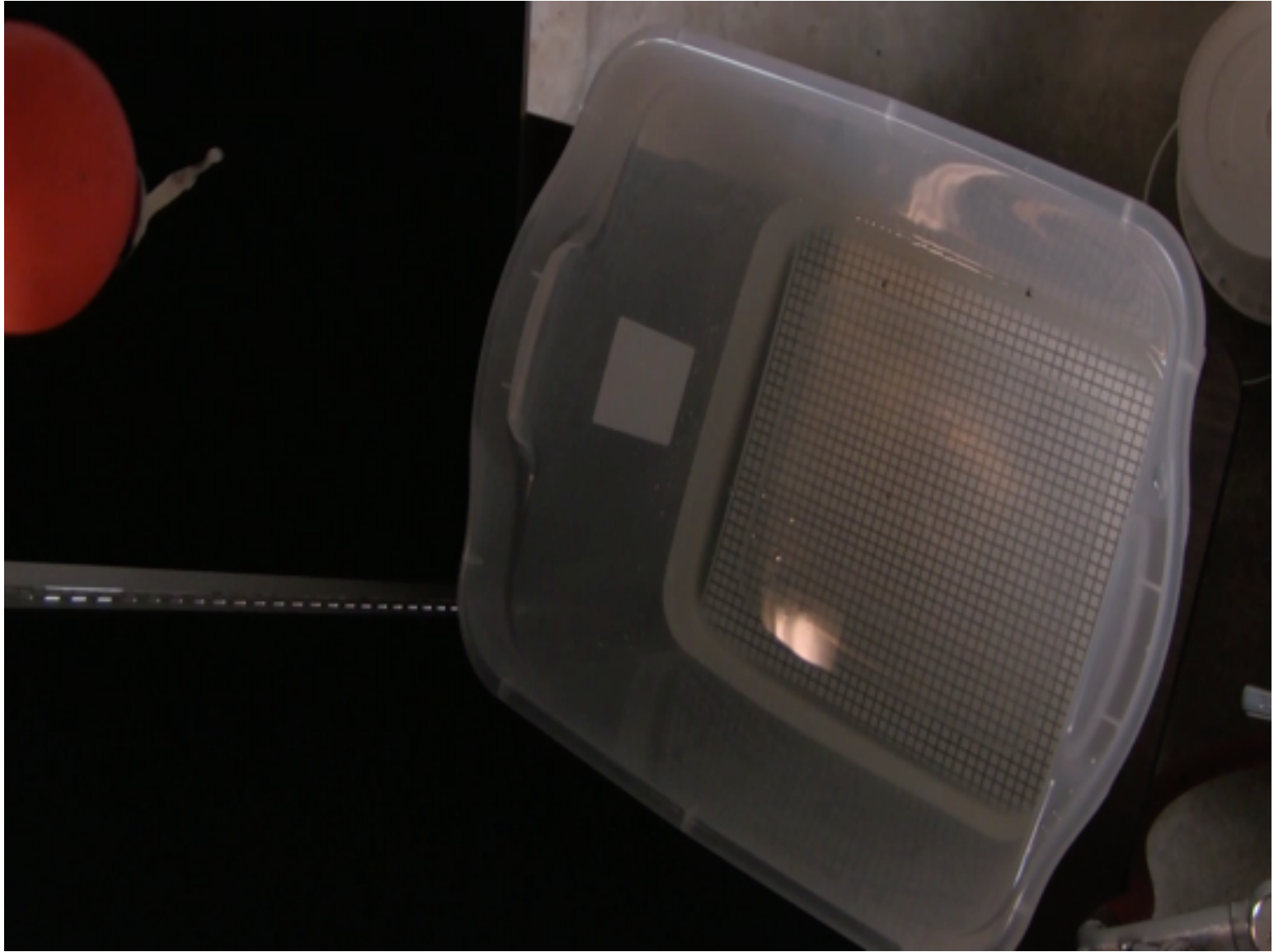


# Understanding Bull Frog Predation

- Are there population level differences in behavior between frogs from habitat with and without bullfrogs?

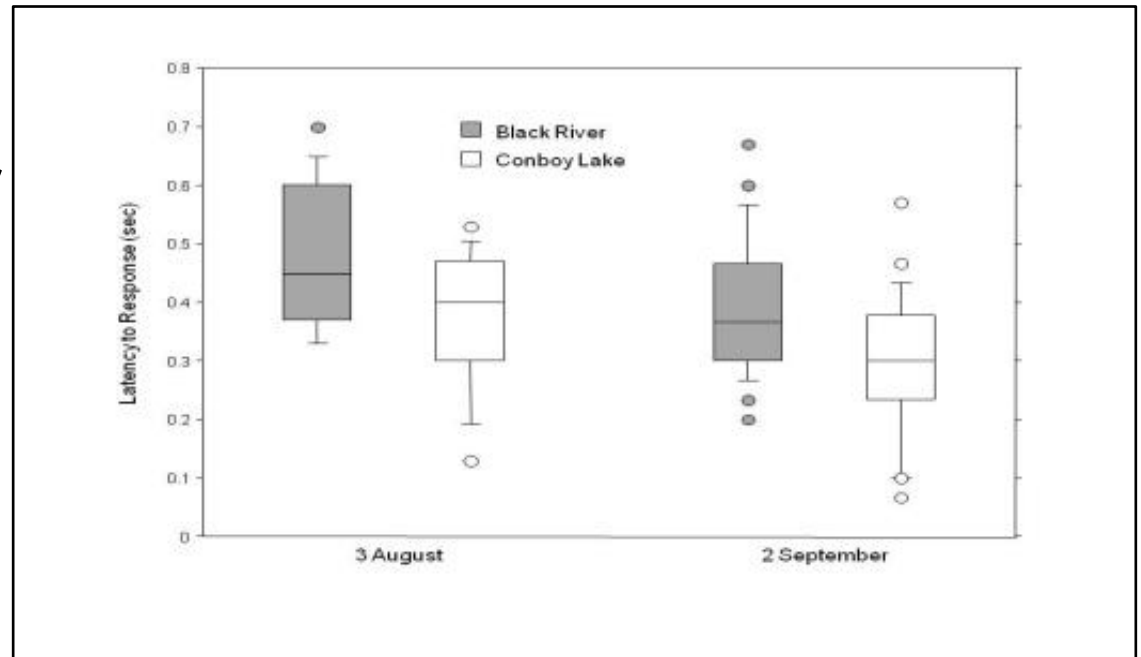


Tidwell, K. S., D. J. Shepherdson and M. Hayes (2013). "Inter-population Variability in Evasive Behavior in the Oregon Spotted Frog (*Rana pretiosa*)."  
*Journal of Herpetology* **47(1): 93-96.**



# Latency to Respond – Source effect

Conboy frogs react faster than Black River



Kyle Tidwell PSU/OZ



Marc Hayes WDFW

Tidwell, K. S., D. J. Shepherdson and M. Hayes (2013). "Inter-population Variability in Evasive Behavior in the Oregon Spotted Frog (*Rana pretiosa*)."  
*Journal of Herpetology* **47(1)**: 93-96.

# Zoo Conservation Roles

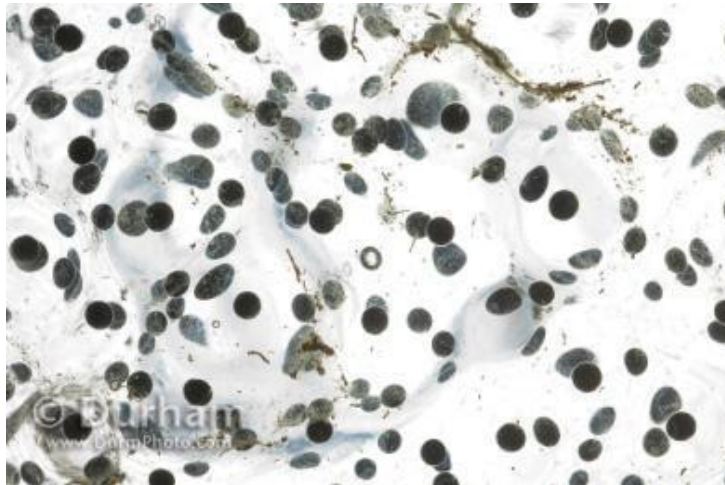
- Animal welfare
- Species recovery
- Education/outreach - behavior change
- Science
- Citizen Science
- Funding
- Stimulate discussion and dissemination



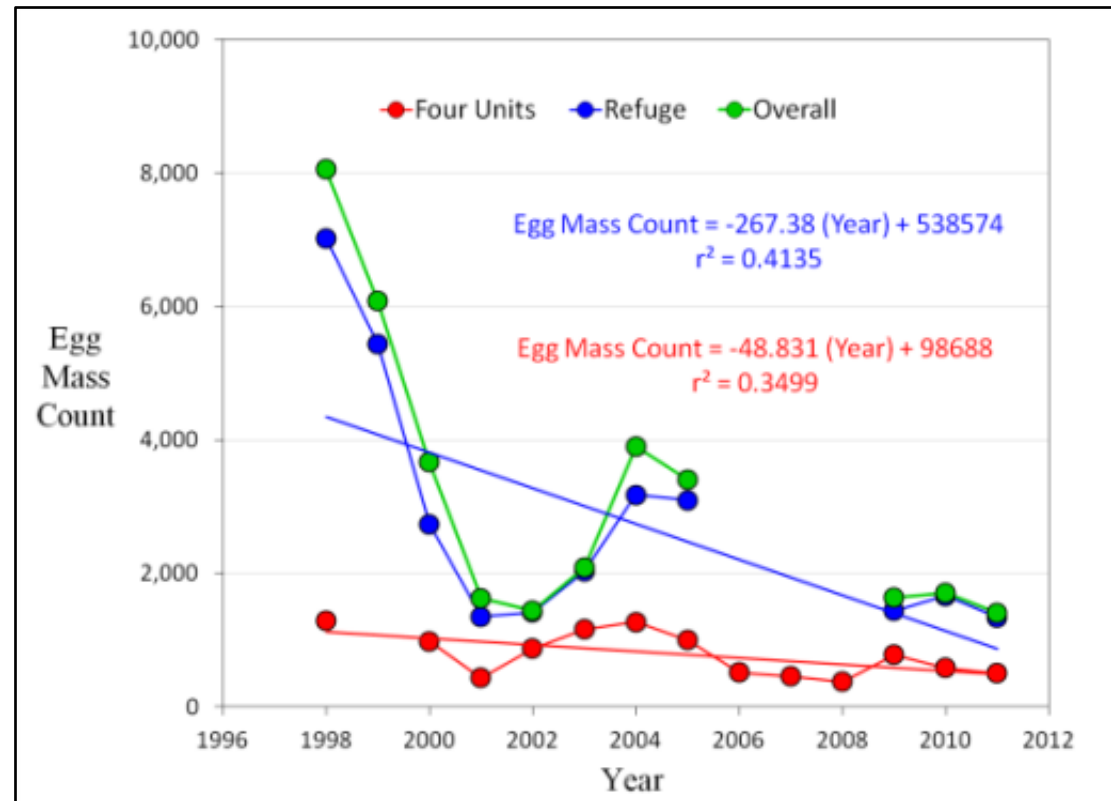
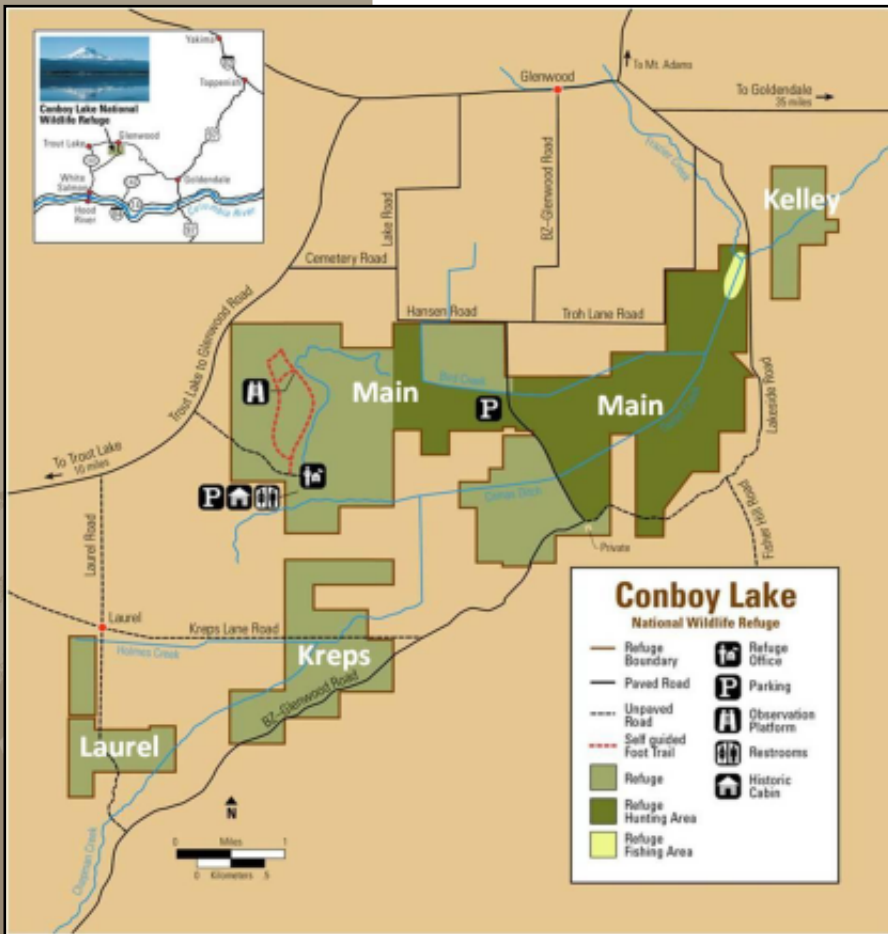
# Conboy Lake Egg Mass Counts



# Conboy Lake Egg Mass Counts



# Conboy Lake Egg Mass Counts



# Zoo Conservation Roles

- Animal welfare
- Species recovery
- Education/outreach - behavior change
- Science
- Citizen Science
- Funding
- Stimulate discussion and dissemination



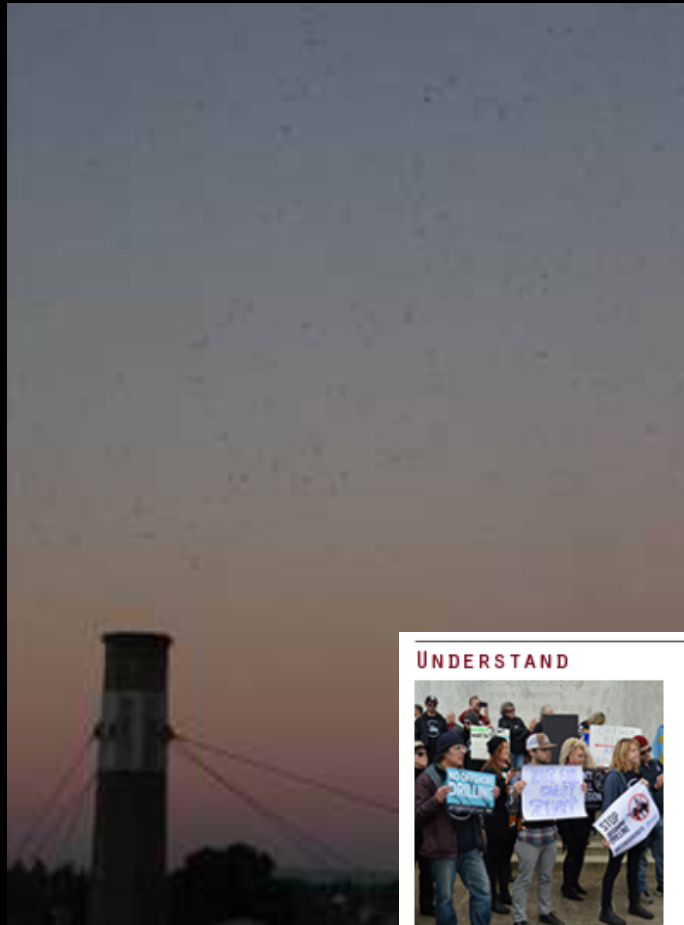


# Citizen Science

- Frog Watch
- Pika Watch
- Beach Monitoring
- Rock Fish Surveys
- Habitat Restoration
- Amphibian Surveys



# Citizen Science



## UNDERSTAND



### Conservation Advocate Orientation

Interested in joining our team of volunteer activists this fall? Join us for our Conservation Activist Orientation on September 25! You'll get an overview of our current conservation initiatives and learn how you can make a difference. [More.](#)

## ENJOY



### Watch the Swifts With Us This September!

Every year, thousands of Vaux's Swifts gather in the city and roost at Chapman Elementary as they prepare to migrate. Join us during the month of September to watch these aerial acrobats! [More.](#)

## PROTECT



### Take the Pledge to Go Lights Out!

Help reduce the impacts of light pollution on wildlife, save energy and money, reduce our carbon emissions, and preserve our view of the night sky! Your participation helps make our region safer and healthier for wildlife and humans alike! [More.](#)

## WILDLIFE CARE CENTER



### A Bald Eagle Far from Home Lands in Troutdale Sewage Lagoon

After landing in a sewage slurry at a local Wastewater Treatment lagoon, this Bald Eagle made a full recovery thanks to the help of a Waste Treatment Operator and the Wildlife Care Center. [More.](#)

# Habitat Restoration



# Zoo Conservation Roles

- Animal welfare
- Species recovery
- Education/outreach - behavior change
- Science
- Citizen Science
- Funding
- Stimulate discussion and dissemination



# Zoo Small Grant Funding

- Oregon Zoo - Future for Wildlife
- Point Defiance - Holly Reed
- Woodland Park Zoo – Wildlife Survival



# Future For Wildlife Program

- Contributes directly to the health of wild populations through funding and species recovery programs
- Engages in *in-situ* and *ex-situ* species recovery in the Pacific Northwest and around the globe



# Future For Wildlife Funding

- Species recovery in PNW
  - Oregon Spotted frog
  - CA Condor
  - Wolverine
  - W. pond turtle
  - Pika citizen science
  - Bumble bee
- International Endangered species conservation
  - Humboldt penguin
  - Asian elephant
  - Rodrigues fruit bat
  - Zimbabwe carnivores
  - Uganda conservation education



# Zoo Conservation Roles

- Animal welfare
- Species recovery
- Education/outreach - behavior change
- Science
- Citizen Science
- Funding
- Discussion & Dissemination





# TWS/Oregon Zoo Wildlife and Lead Workshop 2013





OREGON  
ZOO

A SERVICE OF METRO