

# The Utility of Accessioned Collections for Conservation Management of Endangered Species



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# Bio of a Museum Collection End-User





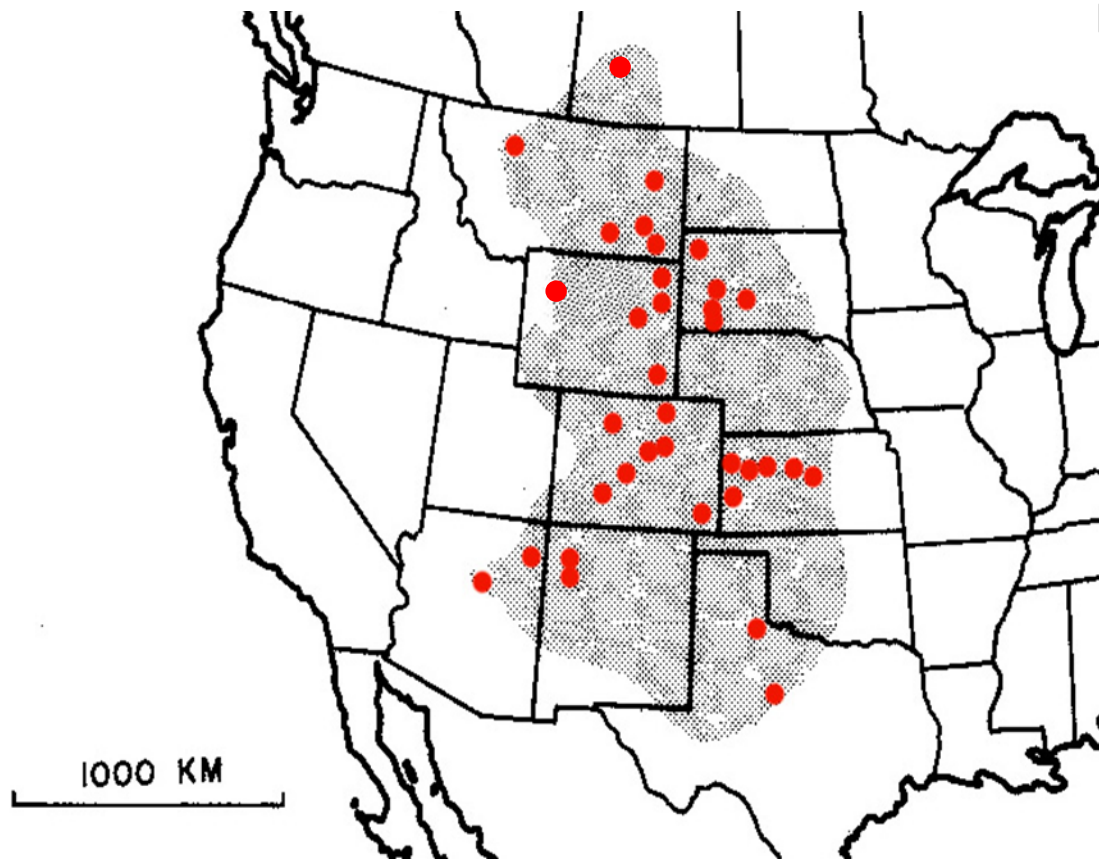
# Conservation Management of Endangered Species

- Define
  - Distribution or Population information
- Manage
  - Natural history/critical habitat
- Protect
  - Forensics



# How can natural history museums help?

Provide temporal and spatial breadth and resolution



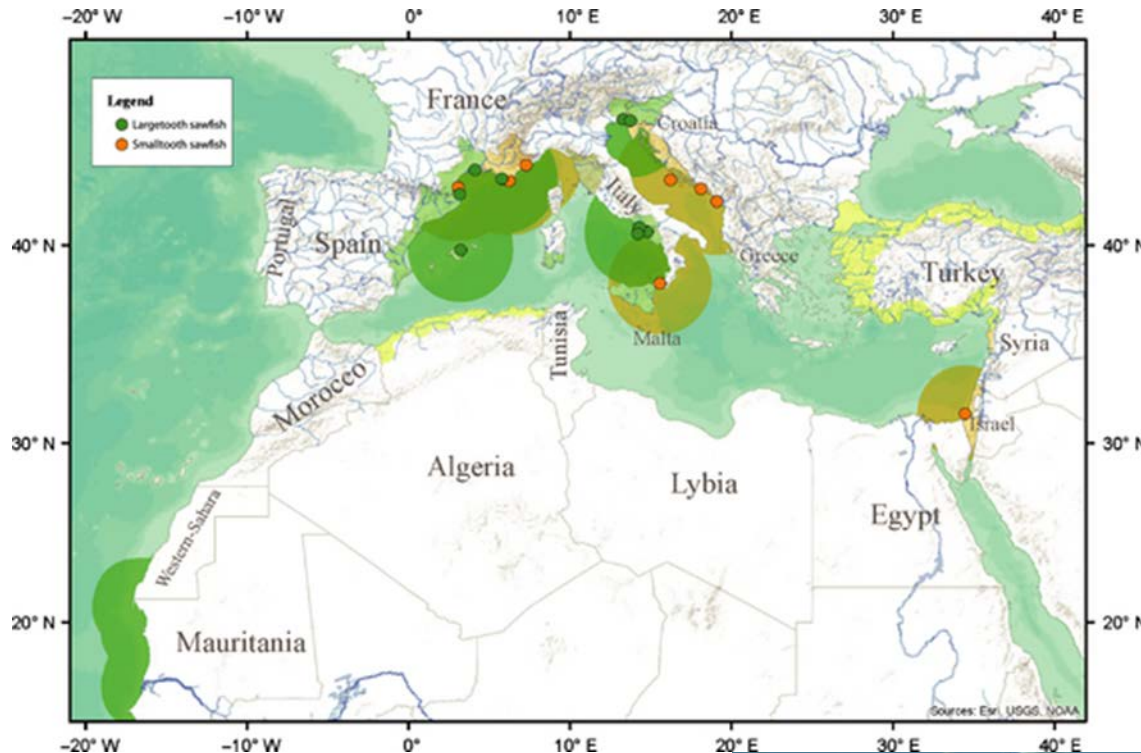
Black-footed Ferret, *Mustela nigripes*



From 1884 to 2009

# Distribution

Range shifts, contractions, expansions



Ferretti et al. 2015

## THM

- 🦈 Every accession counts
- 🦈 Published holdings influence decision-making
- 🦈 Small collections need assistance

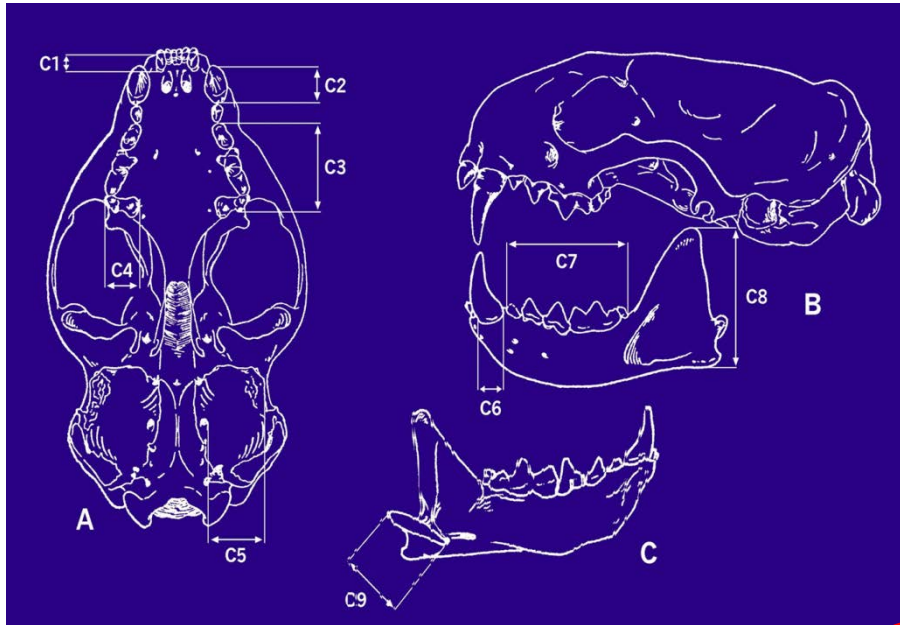


Sawtooth, *Pristis pristis* & *P. pectinata*



# Morphometrics

Taxonomy, functional anatomy, phenotype alteration



Wisely, Ososky, and Buskirk 2002

Wisely et al. 2005

Pre-captive

Large

Captive

Small

Reintroduced

Large

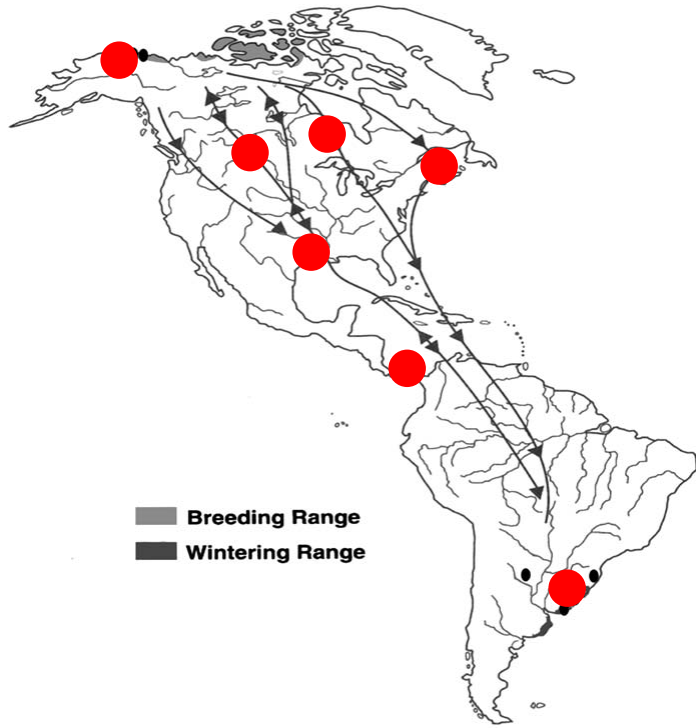
THM

Keep collecting

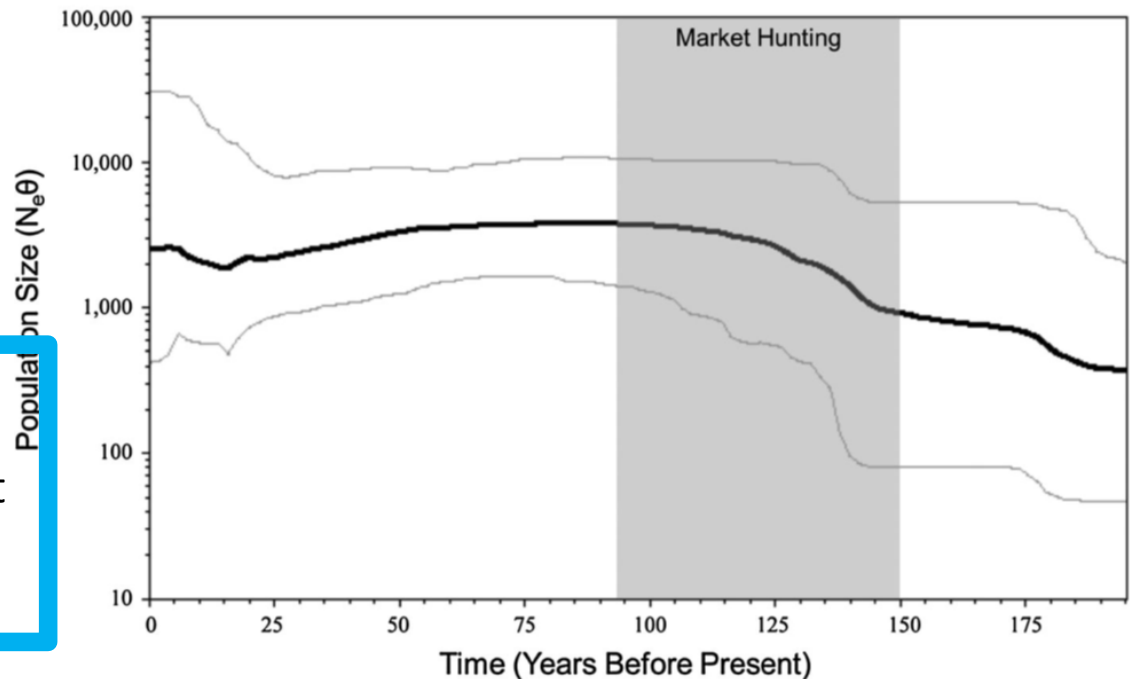
Keep digitizing

# Molecular Ecology

Distinct subpopulations, Population decline



Buff-Breasted Sandpiper  
*Calidris subruficollis*



## THM

- Sample the distributional extent
- Update destructive sampling policy

# Assisted Breeding

With cryopreserved, accessioned collections



- Male gametes
- Female gametes
- Somatic cells



3 Institutions

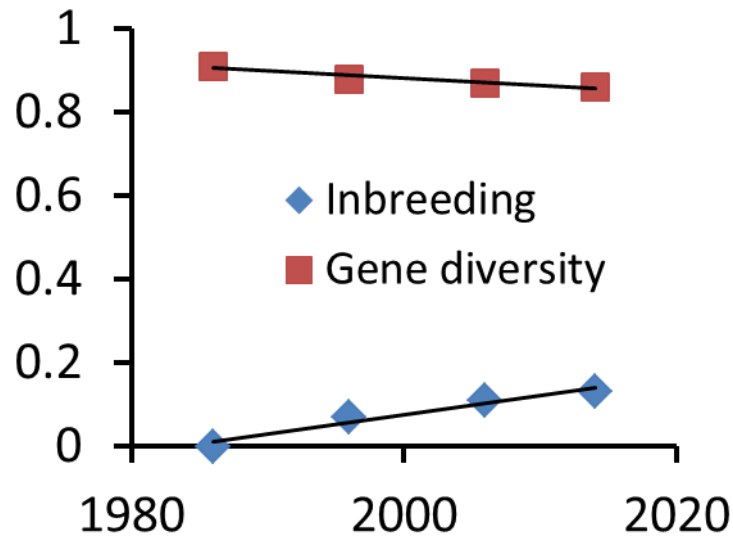




# Assisted Breeding for Conservation



# Assisted Breeding in Black-footed Ferrets



Genetic diversity is dwindling



Dr. JoGayle Howard



## THM

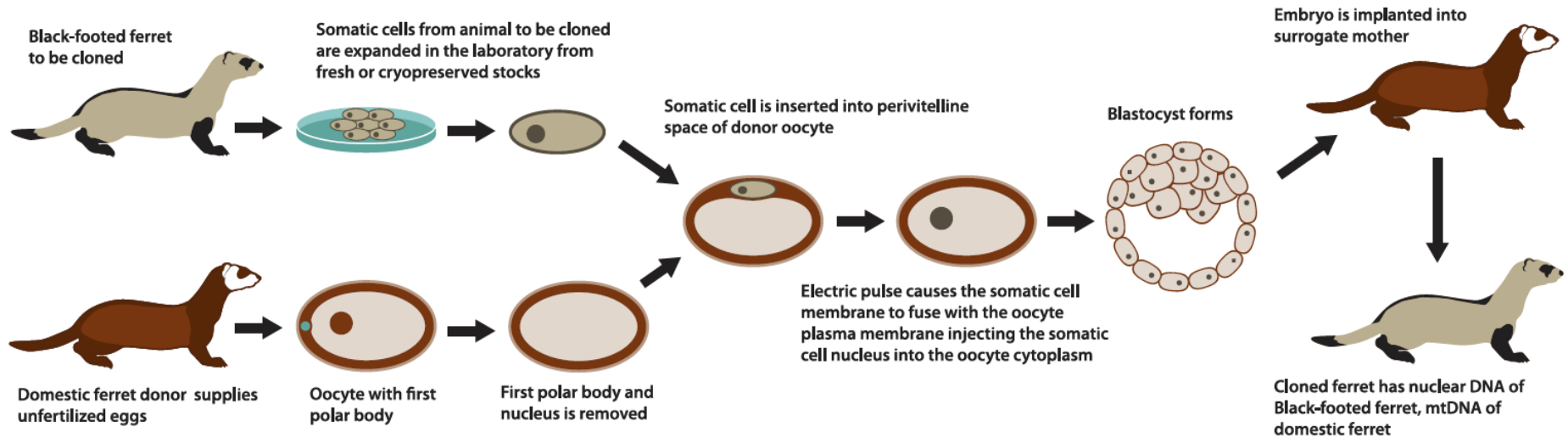
- GRB's are curated, accessioned collections of living cells
- Provide spatial and temporal breadth

- > 140 kits produced
- Slowed genetic drift
- Decreased inbreeding

# Genome Resource Bank

# 21<sup>st</sup> Century Genetic Rescue of Endangered Species

## Somatic Cell Nuclear Transfer





## Resources

Research Labs

SSP Captive  
Breeding Facilities

FWS Recovery  
Team

Outside facilitator  
for Strategic Plan

Funding

## Output

Activities

Participants

Test compatibility and  
feasibility of donated  
oocyte and nucleus

Test efficacy of  
methods to increase  
blastocyst survival

Test methods for  
producing a full term  
clonal organism

Evaluate clonal  
organisms for juvenile  
and adult abnormal

Backcross  
organism  
captive

Develop  
clonal ancestors

Incorporate clonal  
lineage with captive  
lineage

Benchmark Research Lab

Research Lab w/  
Animal Care Facil

Specialists  
Captive Breeding

## Outcomes

Short-term

Medium-Term

Long-Term

Production of a viable  
blastocyst

Development of a  
protocol for successful  
production of healthy  
blastocysts

Production of a viable  
clonal offspring

Development of a  
protocol for producing  
healthy clonal offspring

Production of a  
lineage of healthy  
clonal offspring  
without donor oocyte  
cytoplasmic material

Increased genetic  
diversity in captive  
population

Alleviation of  
inbreeding depression  
in captive population

Alleviation of inbreeding  
depression in  
reintroduced population

# THM



Museum collections are vitally  
important to endangered species  
conservation

Thank you!

Questions?

