Red Wolf Recovery in the Albemarle-Pamlico Region

David R. Rabon Jr.
Red Wolf Recovery Program
U.S. Fish and Wildlife Service

APNEP STAC
Nature Research Center, NCMNS
Raleigh, North Carolina

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The species…

A brief history…

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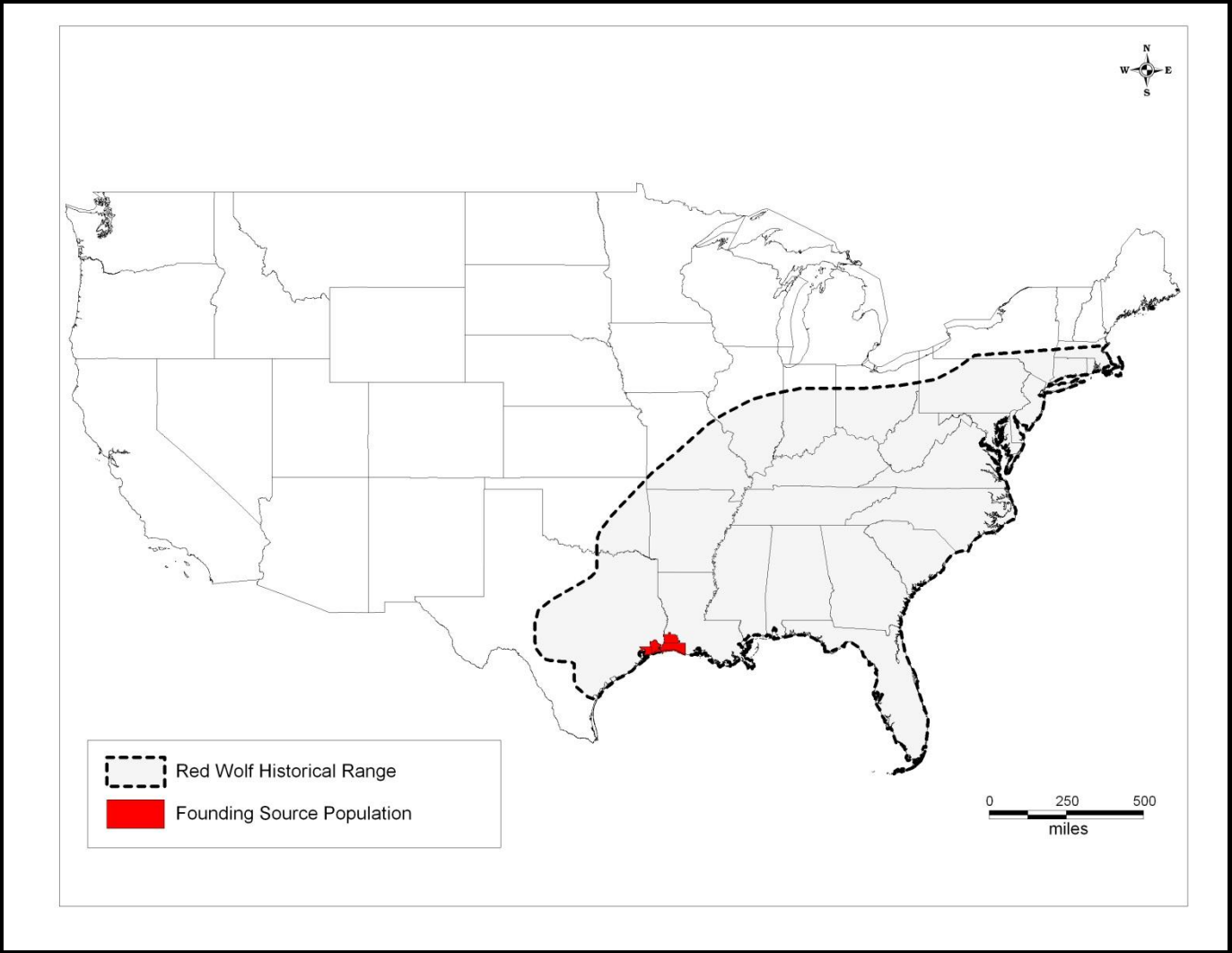


A brief history…

1967 **Red wolf listed as Endangered.**

Red Wolf Recovery Program initiated.

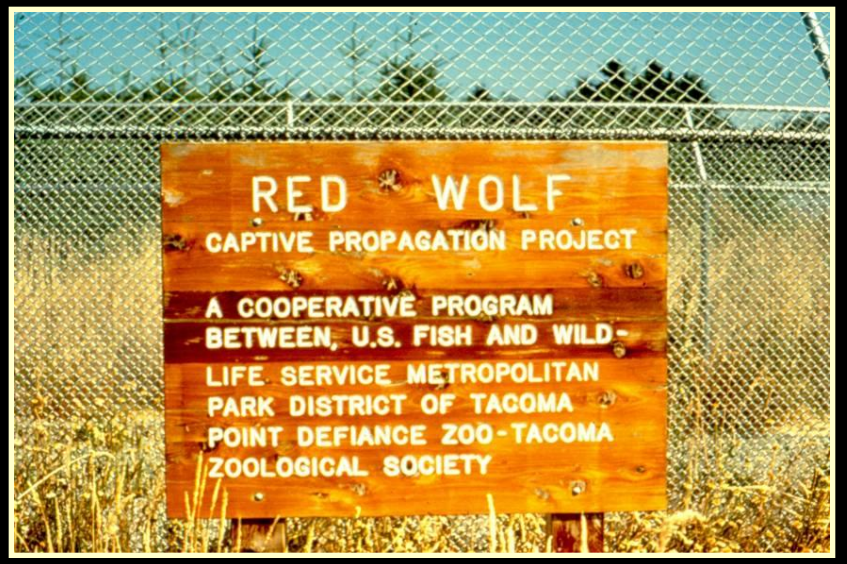
1973 **Endangered Species Act.**

Red Wolf Captive-Breeding Program initiated.

1975 **USFWS concluded preservation in the wild no longer feasible.**

1980 **Red wolf declared functionally extinct in the wild.**

ONLY 14 FOUNDERS!



A brief history…

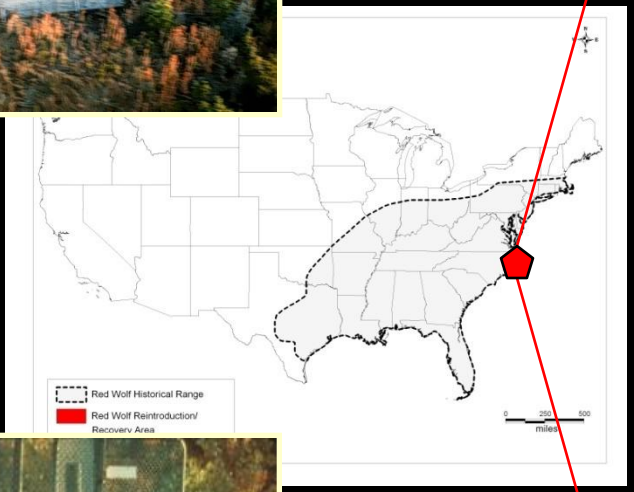
Recovery Objectives

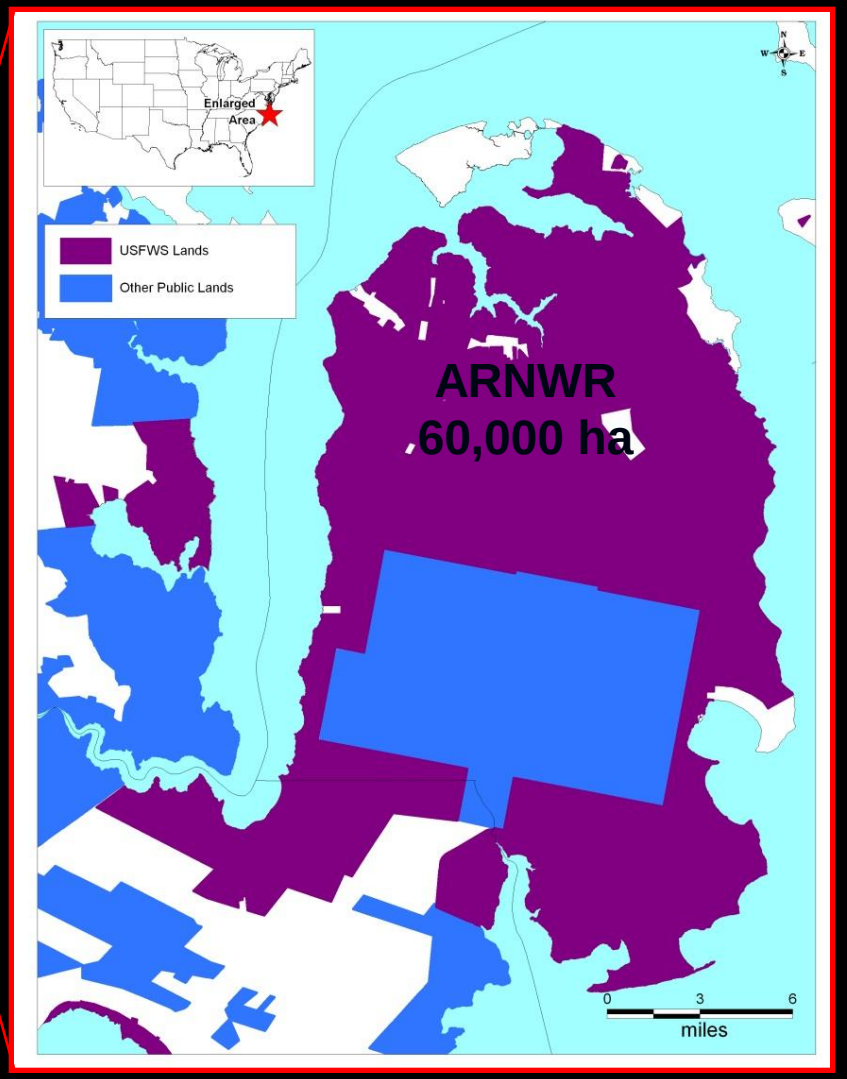
1. **Preserve 80% to 90% of genetic diversity for 150 years.**
   Currently 89.5%

2. **Remove threats that have the potential to bring about extinction.**
   Requires a population of 220 wolves in the wild at 3 different sites & 330 wolves in captivity in at least 30 facilities to maintain genetic and demographic stability.
   Est. 90 to 110 wolves in one wild pop'n; ~165 wolves in captivity

3. **Maintain red wolf in perpetuity through cryogenic preservation of sperm and embryo banking.**
   Initiated process; successful AI of a few females; much work to do

A brief history…





Reintroduction… Alligator River NWR

Preparation of Candidates for Release

- Genetically well represented / Expendable
- Breeding age adults
- Reproductive experience
- Male-Female pairs
- Acclimation pens (1 week to many months)
- Tested hunting skills using live prey
- Overall good health (confirmed by chemistry and blood panels, physical inspection)
- Vaccinations (Canine distemper, Adenovirus type 2, Coronavirus, Parainfluenza, Parvovirus, Leptospira, Canine hepatitis, Rabies)

Reintroduction… Alligator River NWR

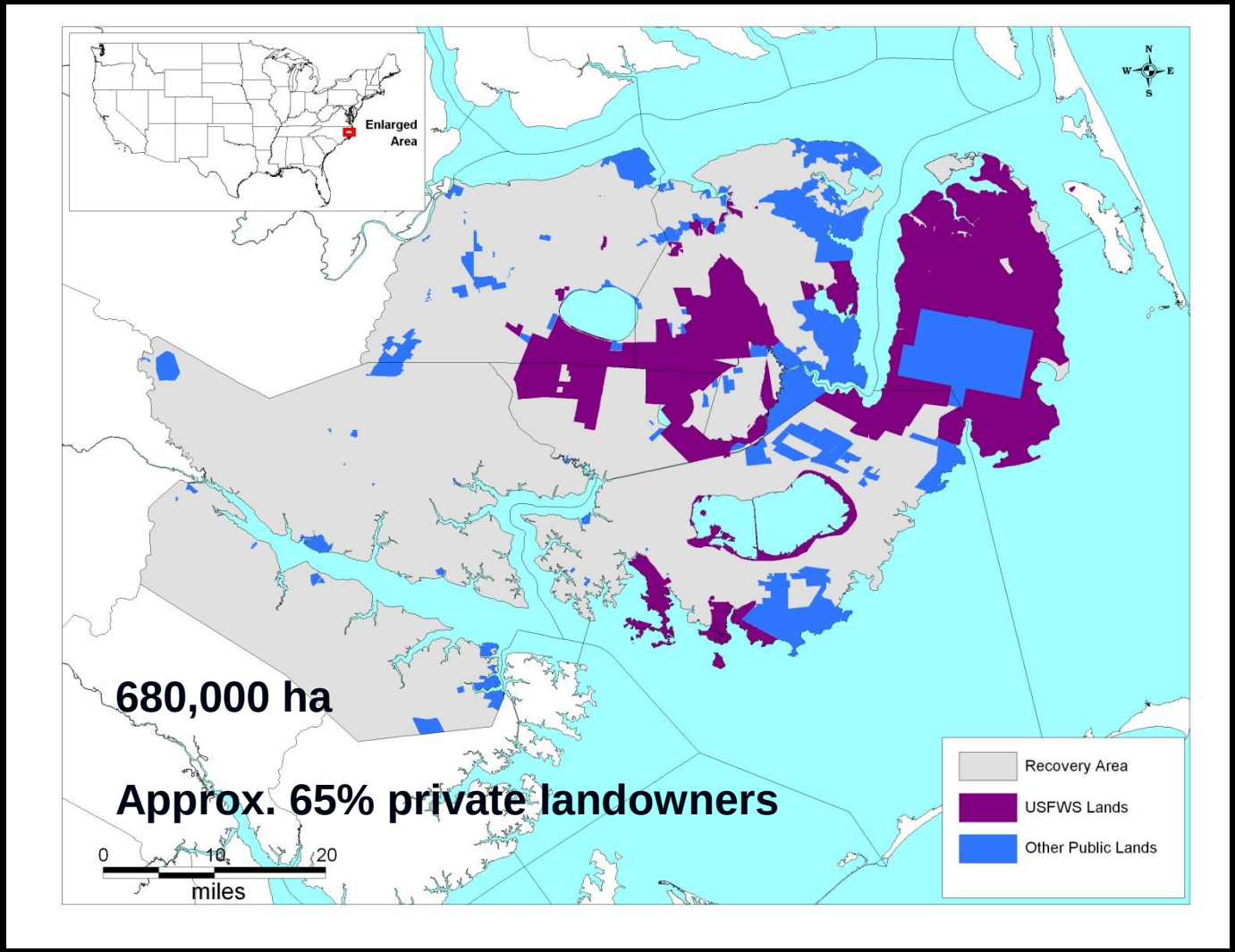
Post-release Monitoring

- Ground and Aerial Telemetry using Very High Frequency (VHF) and Global Positioning System (GPS) collars
- Scat Surveys (diet, distribution, habitat use, and population size)
- Intraspecific interactions/aggression

Criteria for Success

- Survival > 12 months post-release
- Reproduction

A brief history…



Reintroduction… Alligator River NWR

Age and Survival

Older Wolves (>60 months of age)	Younger Wolves (<60 months of age)
n = 8	n = 12
Mean age at release = 75.1 months	Mean age at release = 33.4 months
25% (2 of 8) survived >12 months	30% (4 of 12) survived >12 months

Reintroduction… Alligator River NWR

Pack Size and Survival

Male-Female Pairs	Family Groups
n = 12 individuals (6 pairs)	n = 26 individuals (3 groups)
25% (3 of 12) survived >12 months	35% (9 of 26) survived >12 months
	* 60% (3 of 5) of pups surviving to 22 months of age reproduced

Reintroductions…

Release Type and Survival

Soft Release (adults and juveniles)	Hard Release (adults and juveniles)
n = 37	n = 27
Mean age = 50 months	Mean age = 28 months
49% (18 of 37) survived >12 months	33% (9 of 27) survived >12 months

Hybridization…

1st hybrid event documented in 1993 !

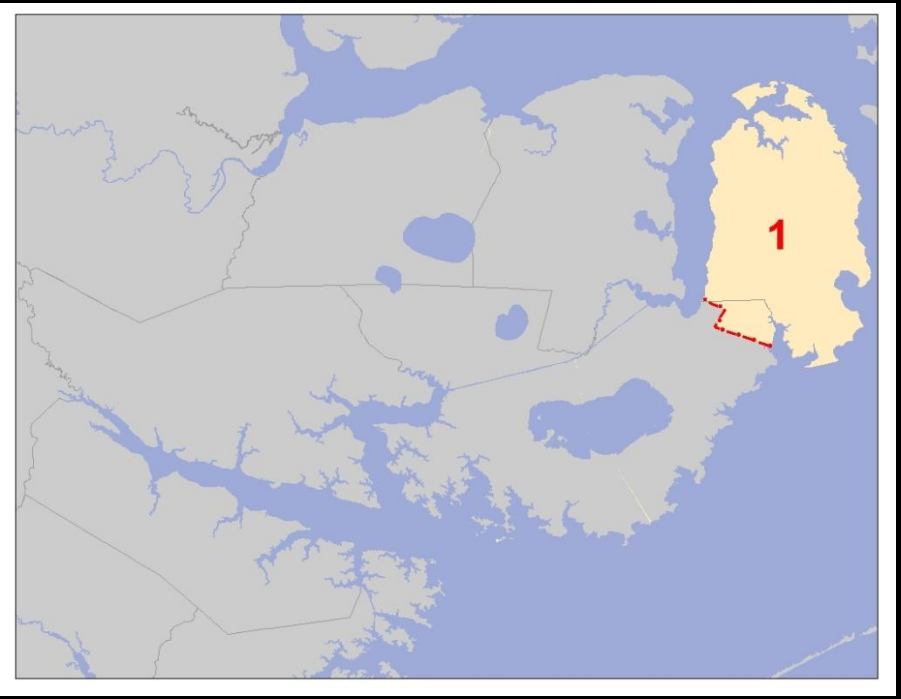
Hybridization…

Adaptive Management Plan – Strategy to establish "coyote-free" zones and move westward while building the red wolf population from east to west:

- Plan created 1999. Full implementation began 2000.
- Advisory scientists (RWRIT) review & recommend.
- Divide experimental area into 3 zones of effort.

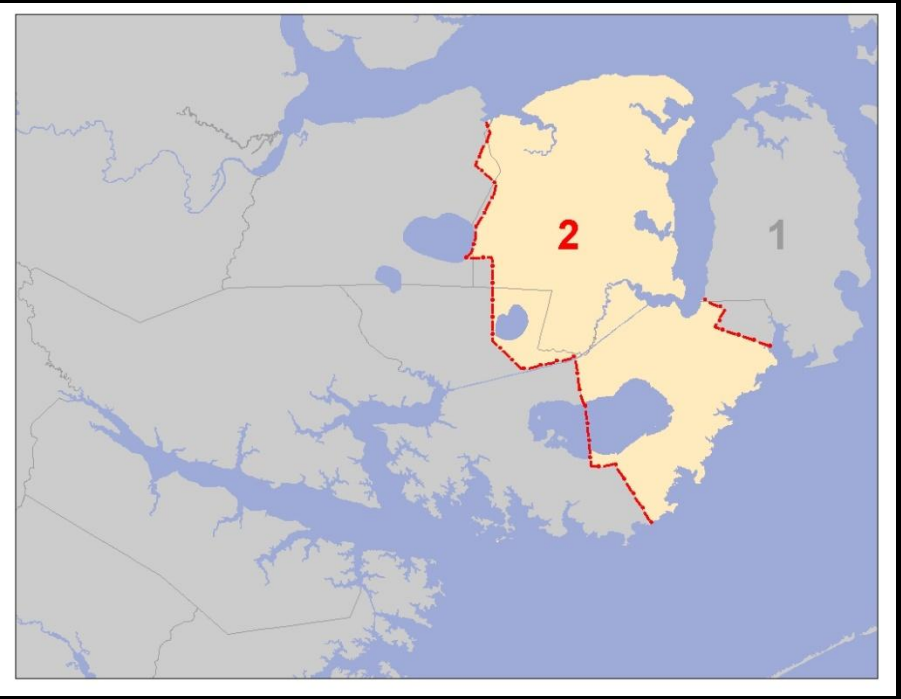
Zone 1
“The Coyote-Free Zone”

- Active removal of all non-wolf canids
- Primarily federal land



Zone 2
“The Isolation Zone”

- Sterile canids as space holders
- Mix of federal and private land



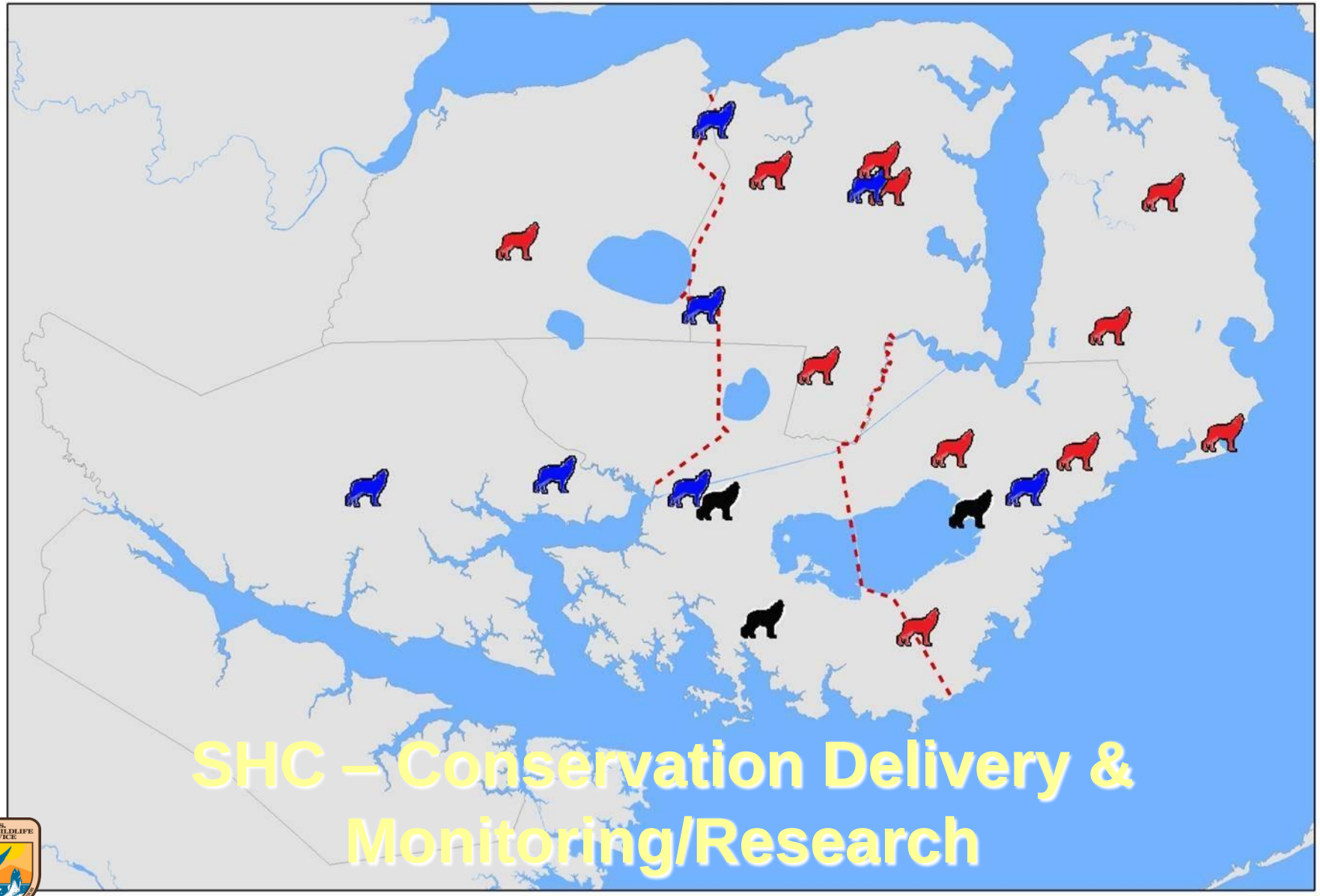
Zone 3
“The Dispersal Zone”

- Lower priority for intensive management
- Mix of federal and private land


3
2
1


3
2
1
U.S. FISH & WILDLIFE SERVICE

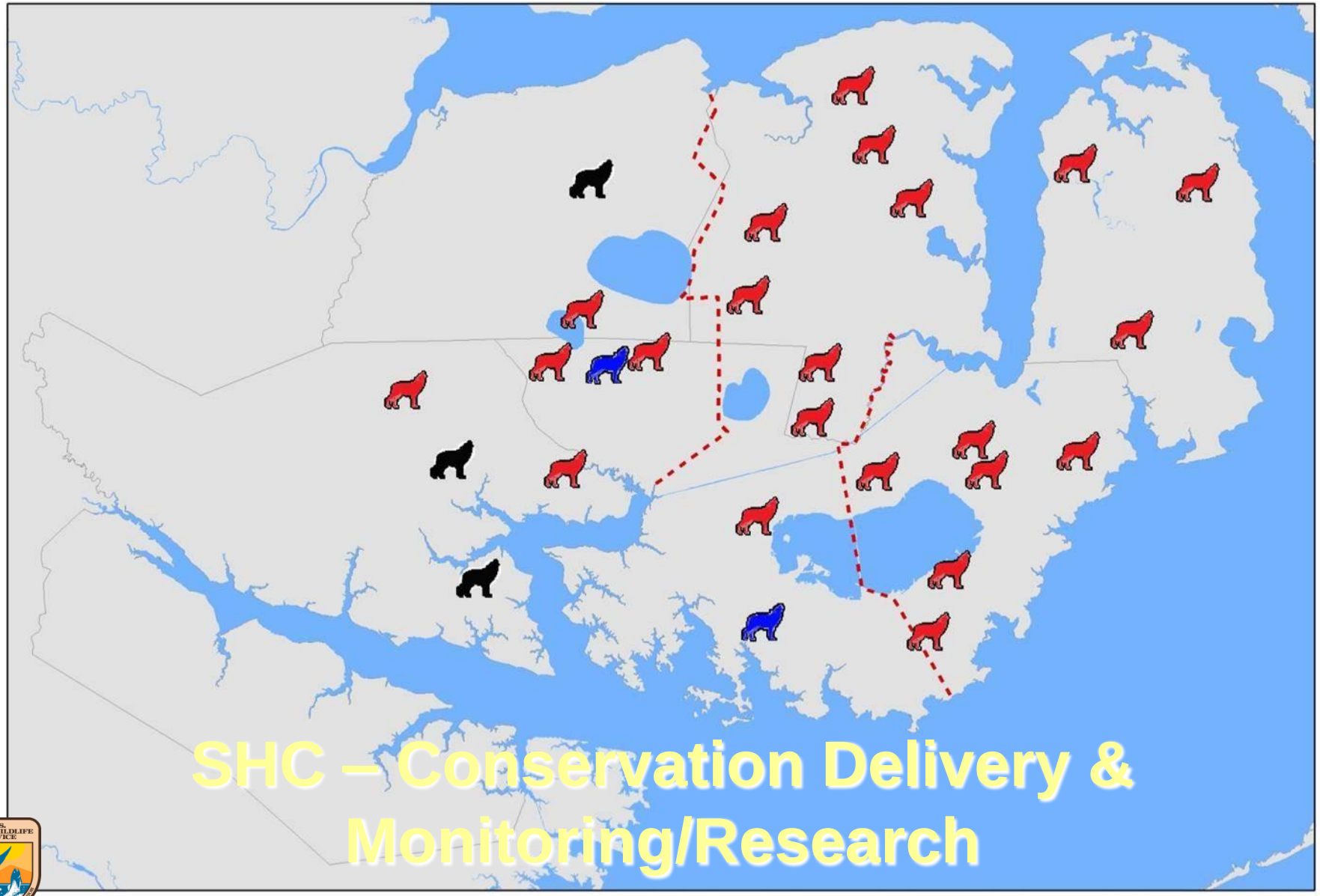
2000 Territorial Units



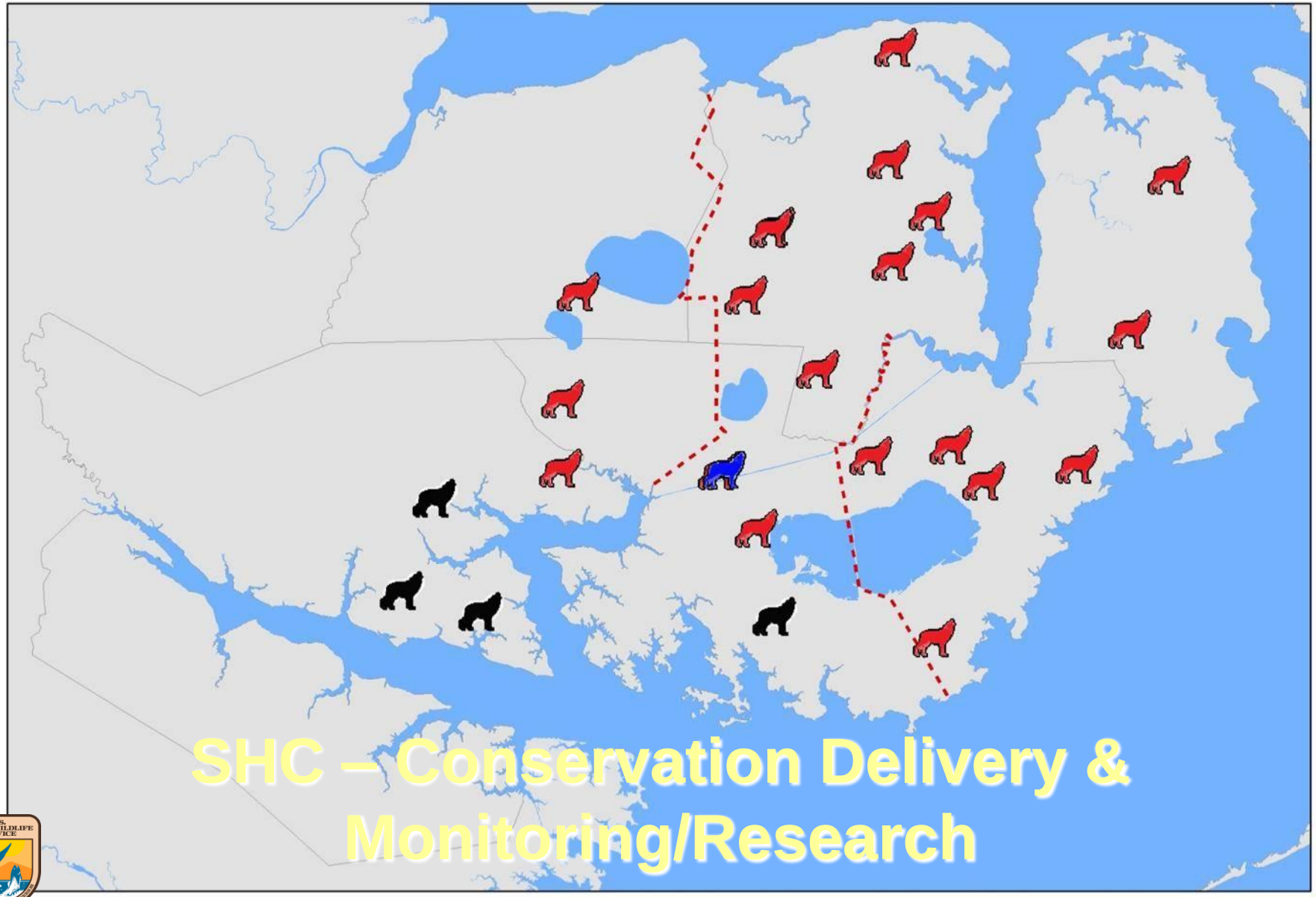
2001 Territorial Units

2002 Territorial Units

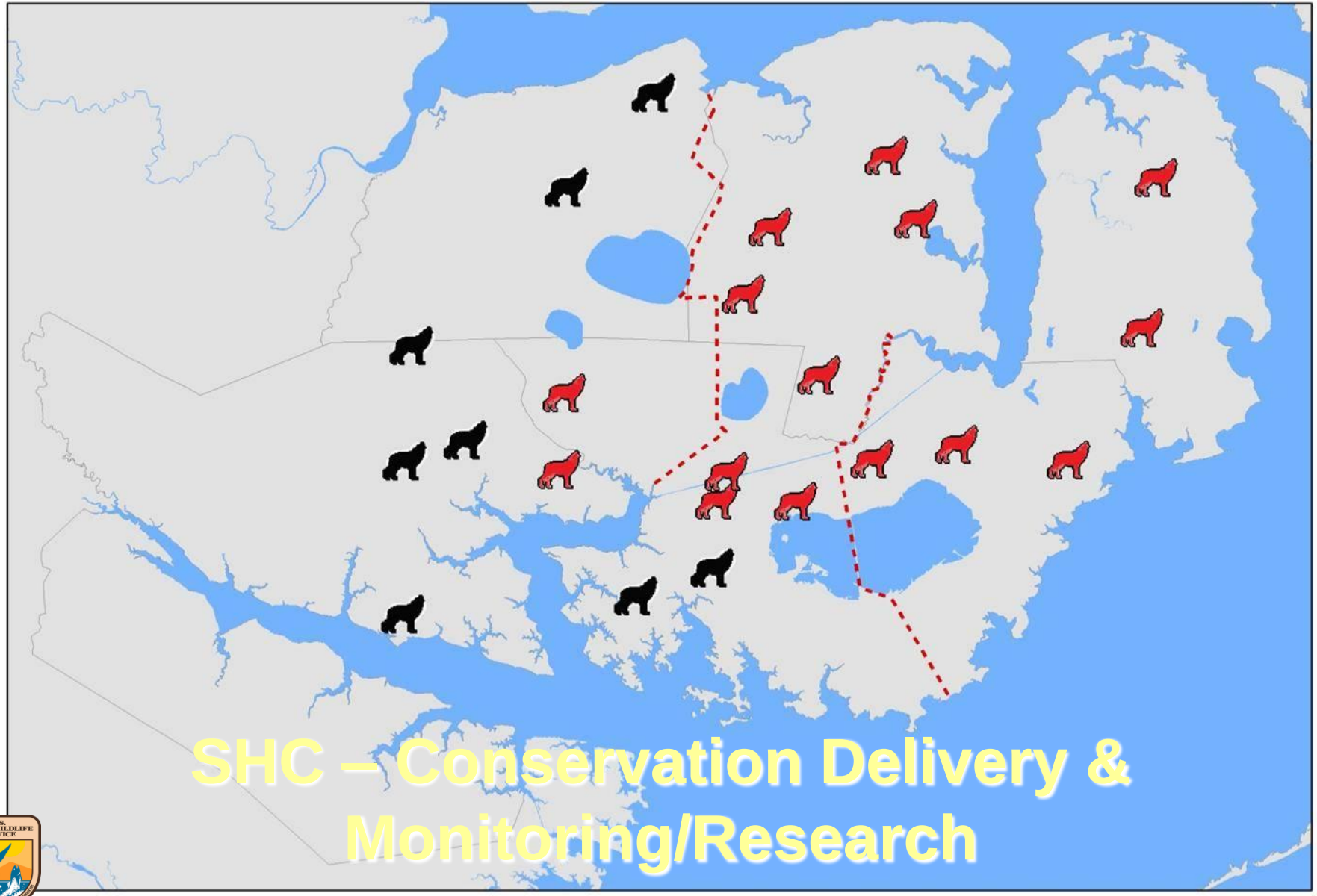
2003 Territorial Units



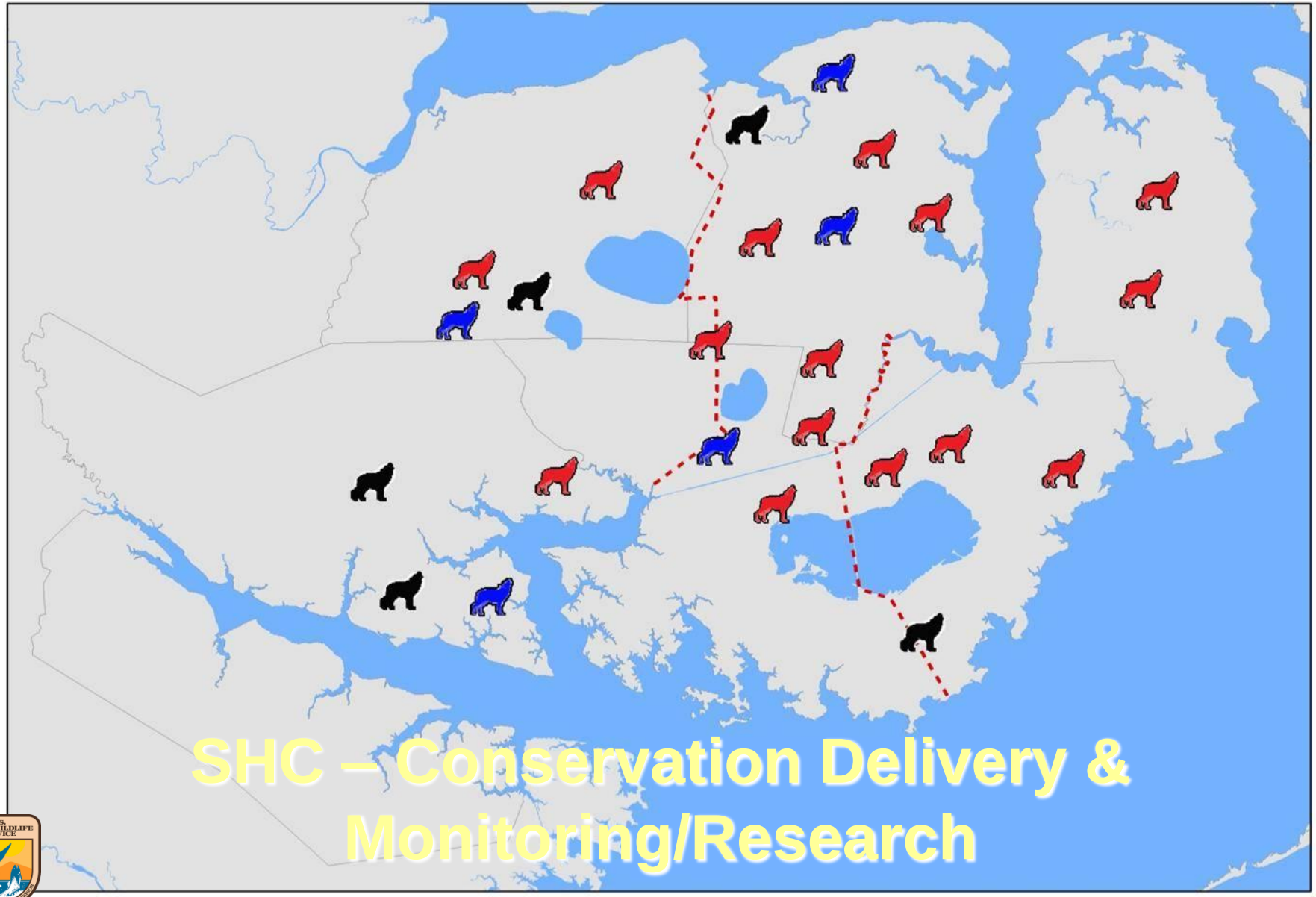
2004 Territorial Units



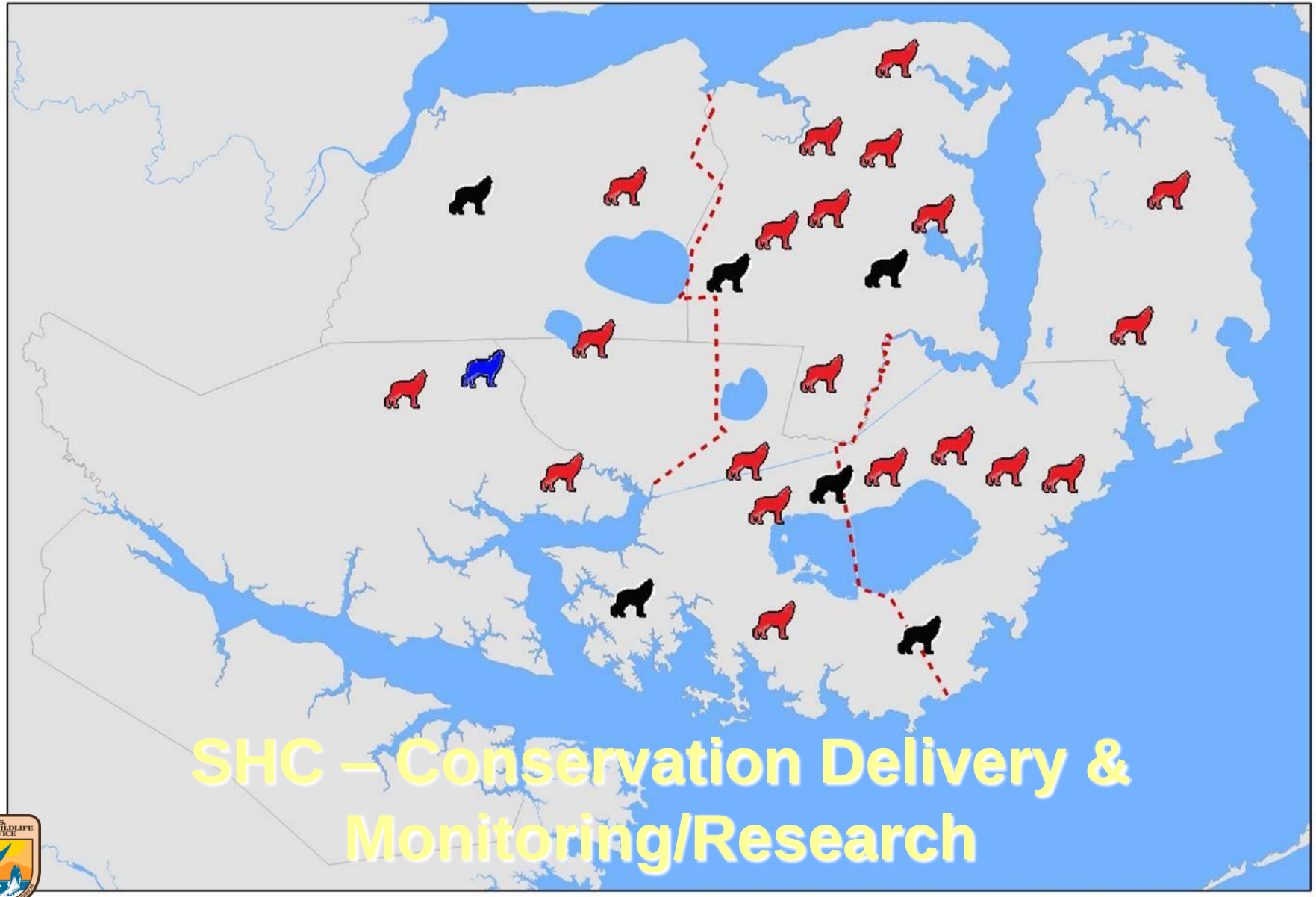
2005 Territorial Units



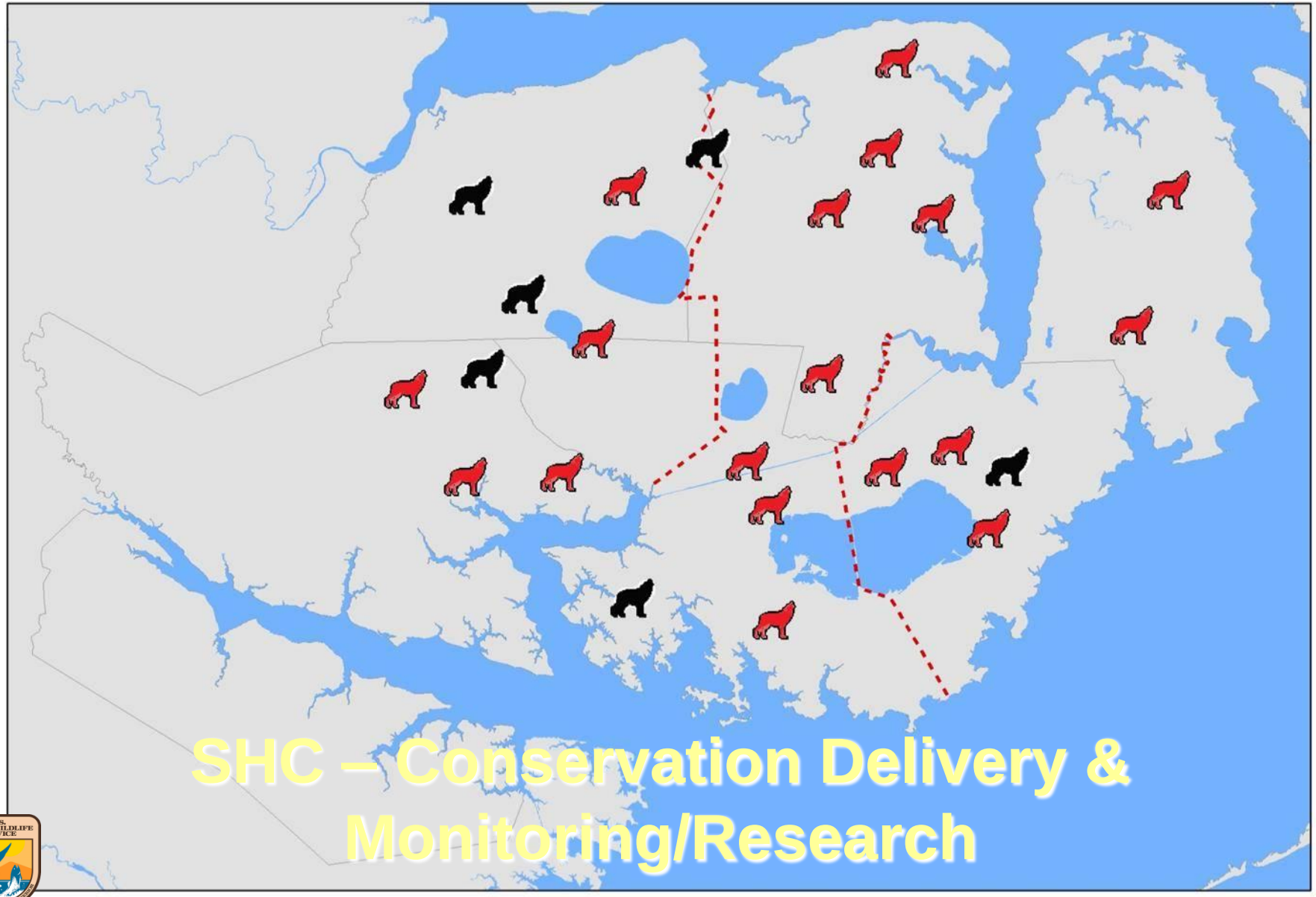
2006 Territorial Units



2007 Territorial Units



2008 Territorial Units



Tools of Adaptive Management… Sterilization

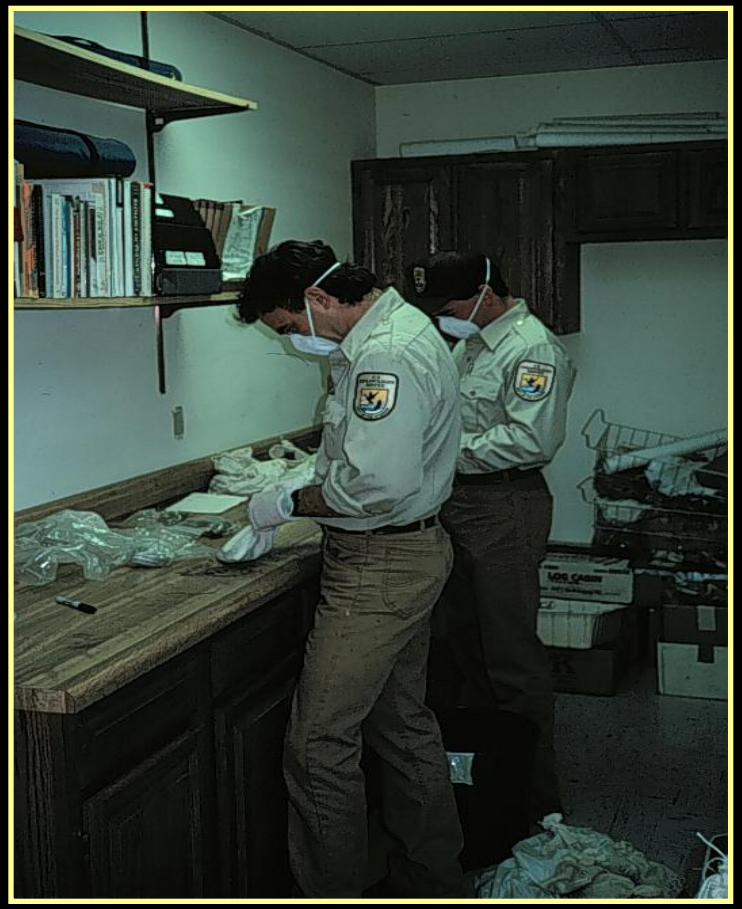
- Euthanize hybrids.
- Euthanize if landowner says no.

- Sterilize coyotes.
- Release coyotes to hold space.

Tools of Adaptive Management… Telemetry

- Ground Telemetry
- Aerial Telemetry

Tools of Adaptive Management… Genetics



- Genetics testing via scat & blood.

Tools of Adaptive Management… Translocations

- Create red wolf breeding pairs.

Tools of Adaptive Management… Insertions

- Insert 18-month-old red wolves from island propagation sites.

Tools of Adaptive Management… Pup fostering

- Visit dens
- ID/Census wild pups
- Transfer captive pups into wild litter

Pup Fostering…

Survival

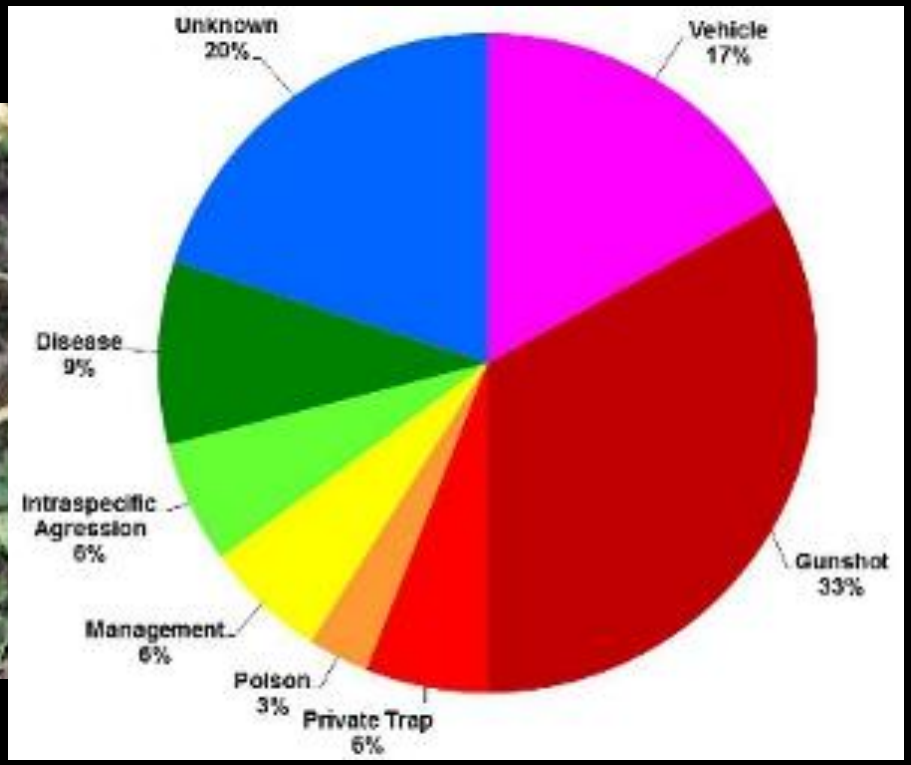
Captive to Wild	Captive to Captive
n = 26 (pups in 13 events)	n = 11 (pups in 7 events)
Mean age source = 10.8 days	Mean age source = 14.5 days
Mean age recipient = 11 days	Mean age recipient = 8.3 days
92% (22 of 24) survived >12 months	82% (9 of 11) survived >12 months

Challenges…

Controlled Hunting Preserves

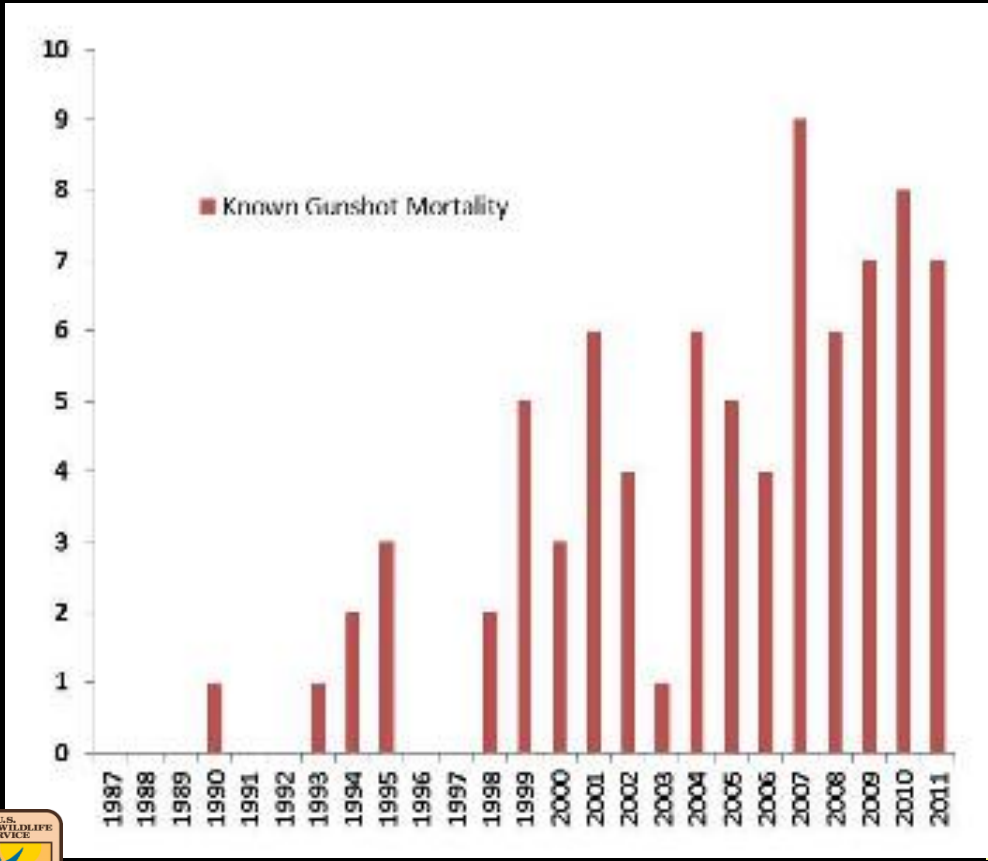
Challenges…

Vehicle Strike



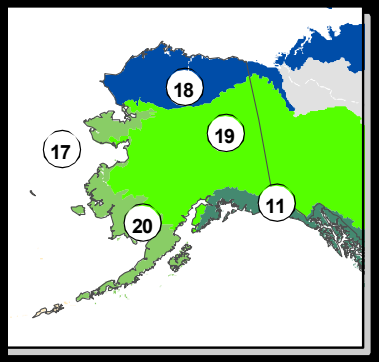
Challenges…

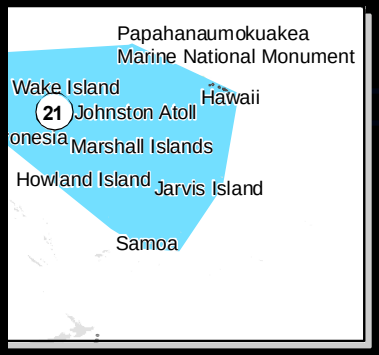
Gunshot

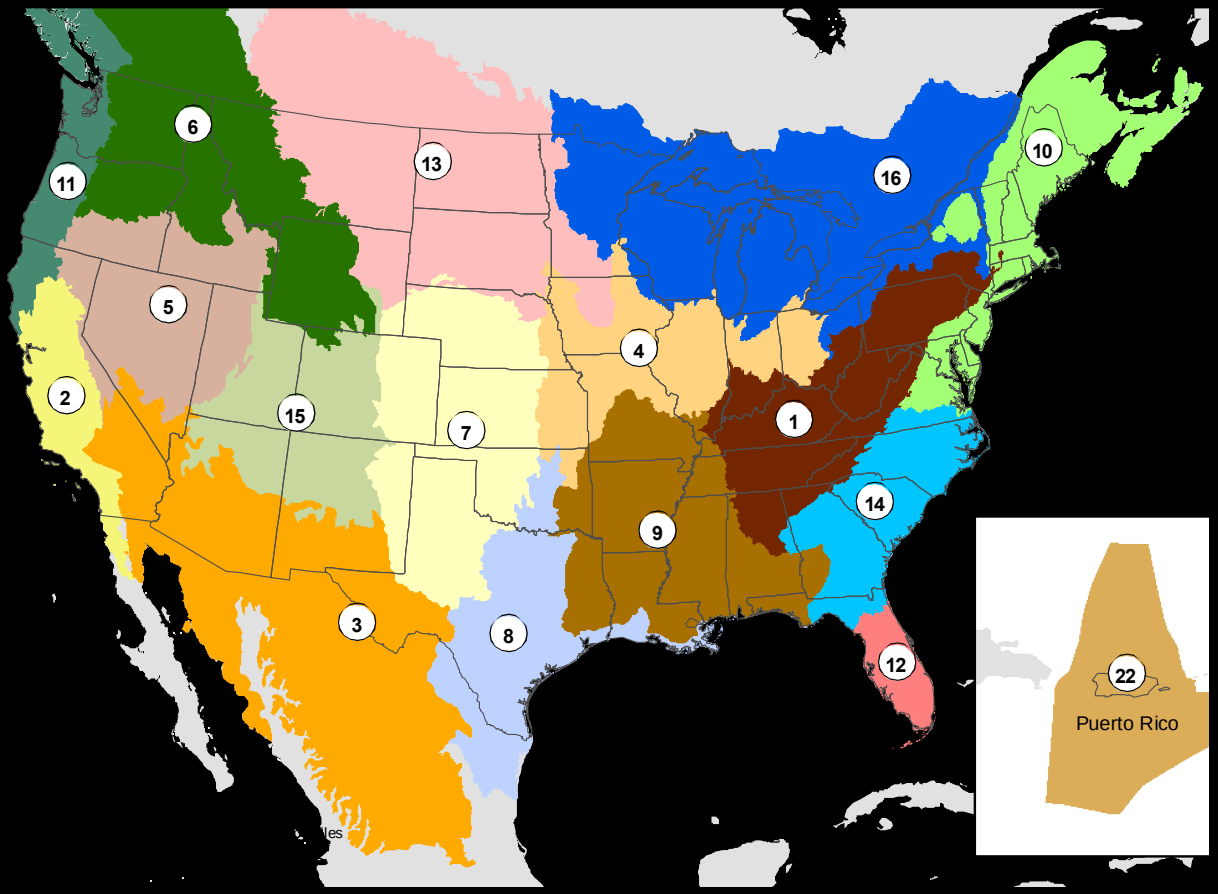


Challenges…

Landscape Scale Conservation

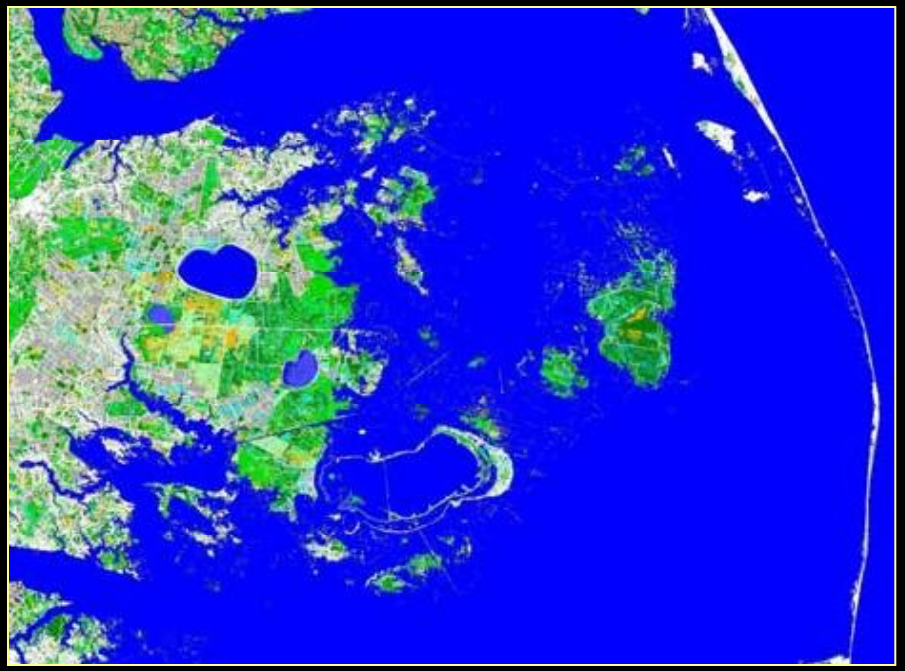






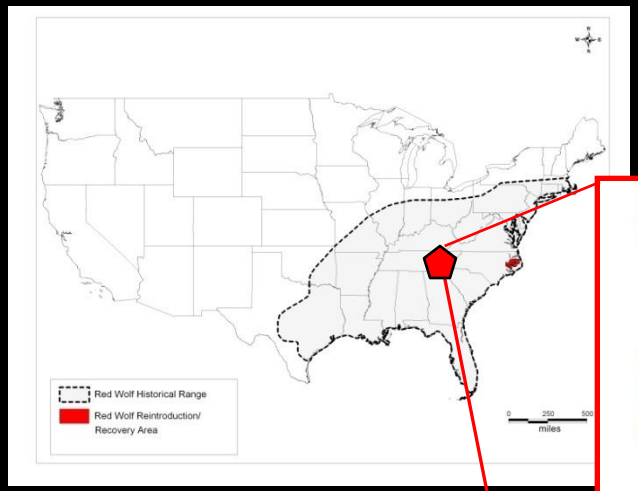
Challenges…

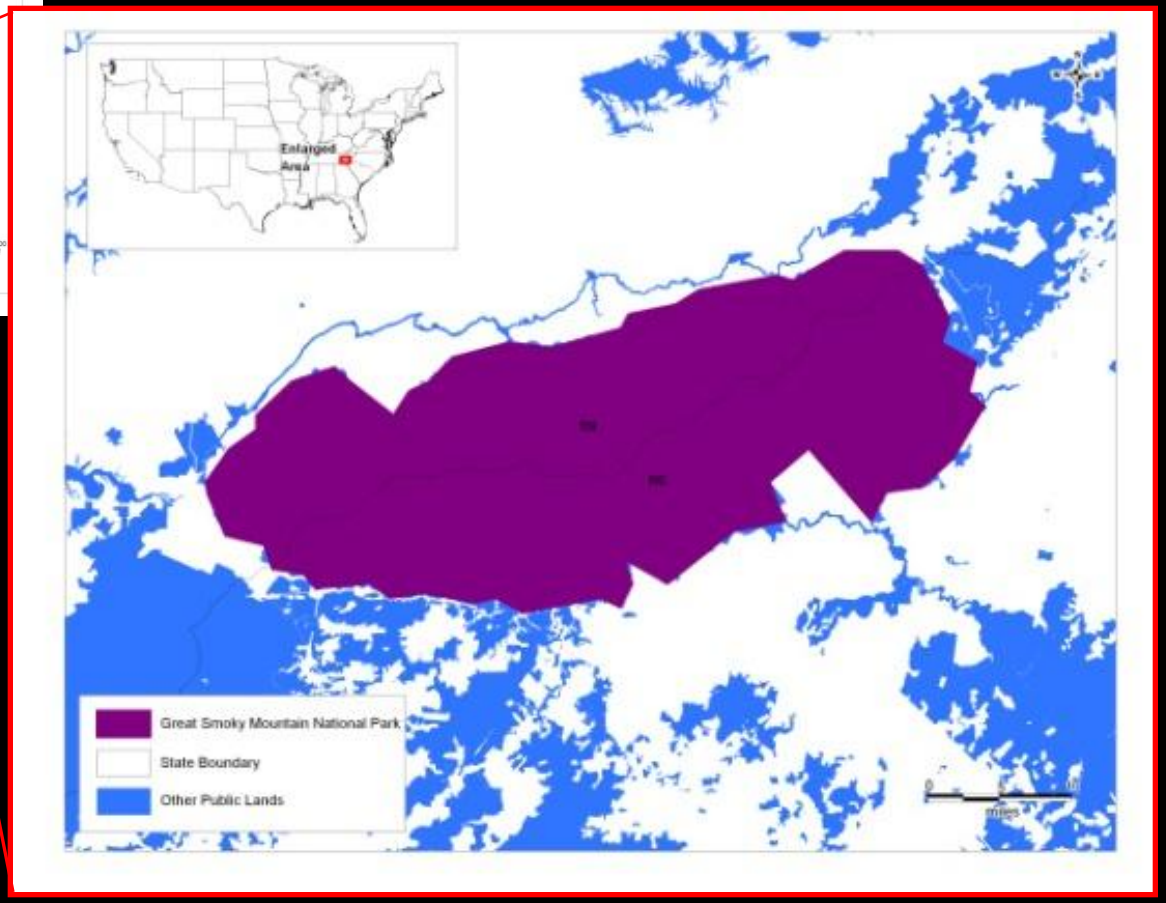
Climate Change



The End

Reintroduction… Great Smoky Mountains NP



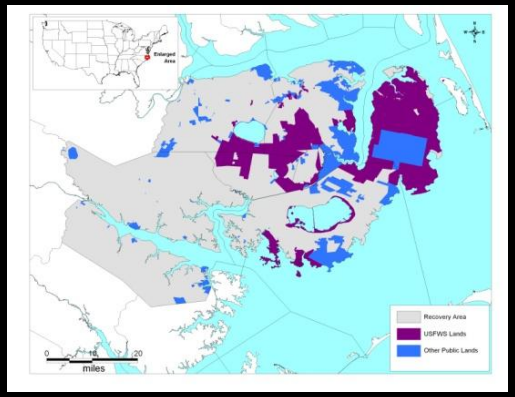


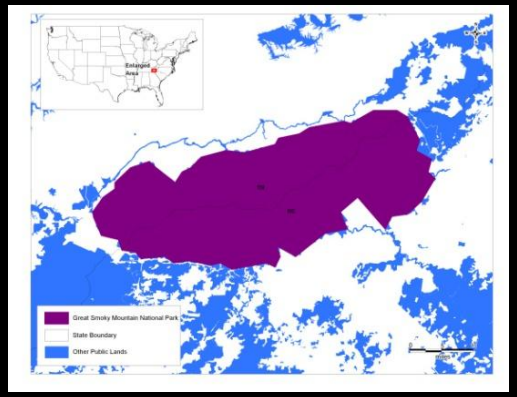
80,000 ha

Reintroductions…

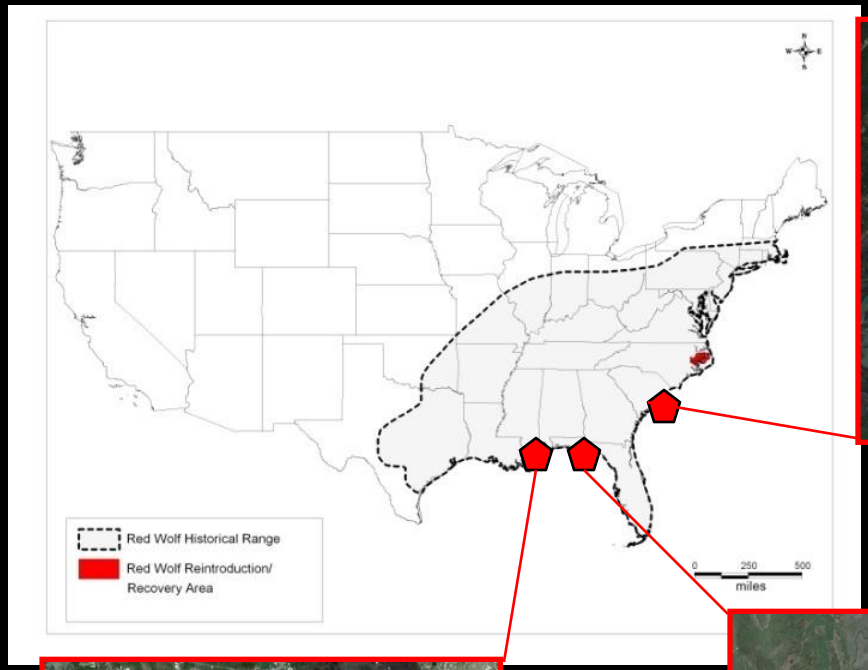
Release Site and Survival

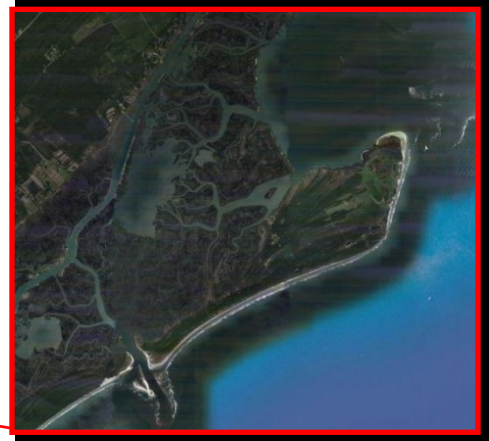
ARNWR (adults only)	GSMNP (adults only)
n = 20	n = 14
Mean age at release = 50 months	Mean age at release = 46 months
30% (6 of 20) survived >12 months	43% (6 of 14) survived >12 months





Island Propagations…





~2000 ha in size

Supports a family group

Juveniles removed at ~18 months old

Rearing and Reintroductions…

Rearing and Survival

Captive Born (Adults)	Island Born (Juveniles)
n = 20	n = 26
Mean age = 50 months	Mean age = 18 months
30% (6 of 20) survived >12 months	46% (12 of 26) survived >12 months
	* 58% (7 of 12) surviving reproduce

Rearing and Reintroductions…

Rearing and Management

Captive Born (all ages)	Island Born (all ages)
n = 40	n = 42
Mean age = 27.2 months	Mean age = 27.4 months
20% removed due to behavior	4.8% removed due to behavior

Rearing and Reintroductions…

Release and Survival

Captive Born (all ages)		Island Born (all ages)	
Soft Release	Hard Release	Soft Release	Hard Release
n = 43	n = 11	n = 18	n = 24
Mean age = 26	Mean age = 14	Mean age = 28	Mean age = 27
30% (13 of 43) survived >12 months post release	18% (2 of 11) survived >12 months post release	56% (10 of 18) survived >12 months post release	38% (9 of 24) survived >12 months post release