Moquah Barrens Translocation

Lessons Learned & Considerations for the Future

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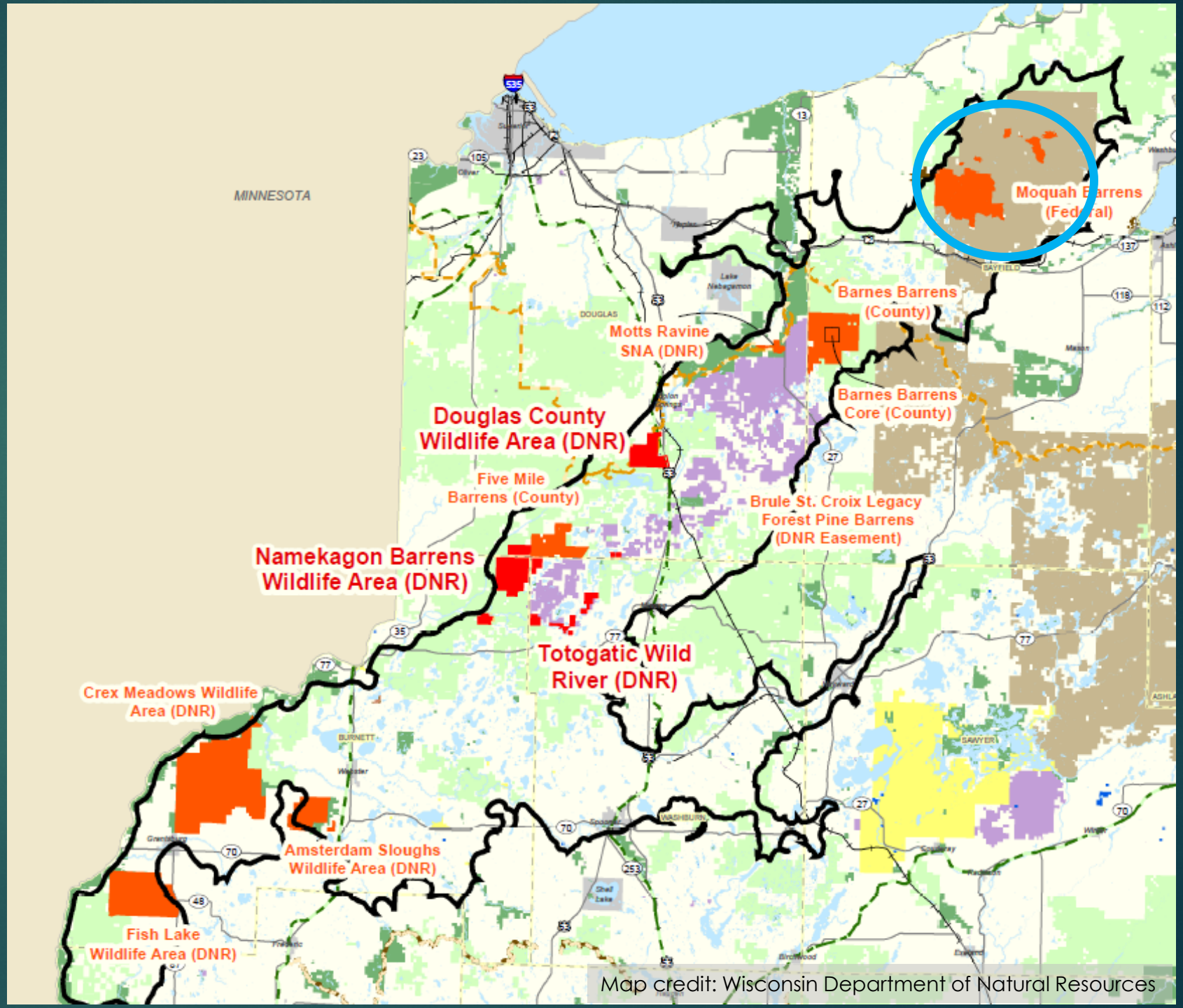
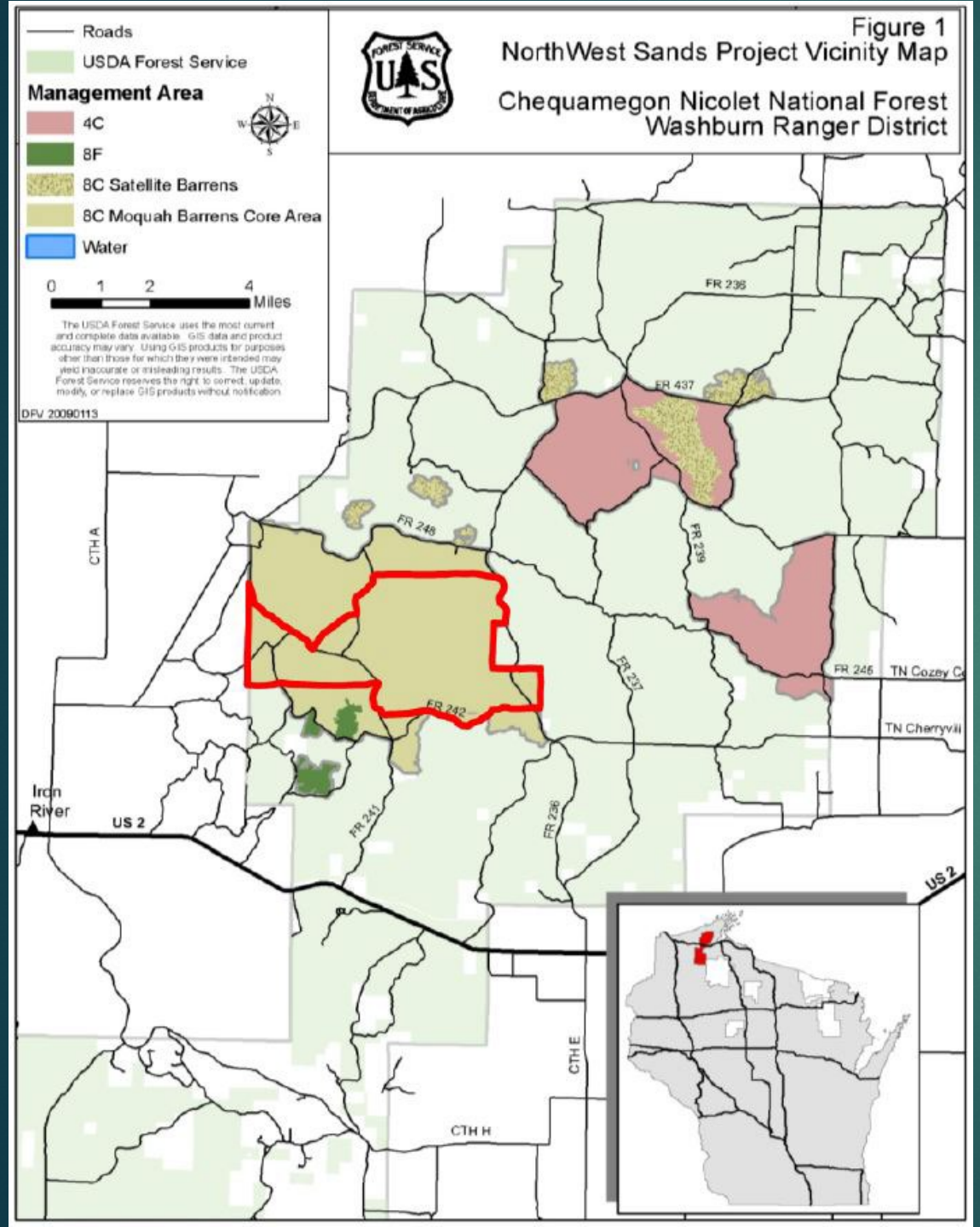
AUGUST 2023

UPPER MIDWEST PRAIRIE GROUSE SUMMIT

Northwest Sands Ecological Landscape

Sharp-tailed grouse in Wisconsin exist primarily on a core group of managed public properties and scattered private lands





Forest Service Northwest Sands Restoration Project

Approx. 23,000 acres

- Core Area = nearly 13,000 ac
- Satellite Barrens & Other Areas = 10,000+ ac

Main goals are:

- Restore the pine barrens ecosystem
  - Veg. structure & species composition
  - Creation of needed wildlife habitat
  - To extent possible, re-creation of natural disturbance processes (ex. fire and wind throw)

- Re-establish fire as a process in the pine barrens ecosystem


Open Barrens


Savanna


Dense Small Trees


Woodland


Closed Forest

Timber Harvest

Prescribed Fire

Multiple Restoration Methods:

Used to:

1. Promote barrens vegetation
2. Reduce competing shrub cover
3. Improve wildlife habitat
4. Restore species composition and structure of the pine barrens

- Prescribed Fire (~1,000 to 3,000 acres per year)
- Mechanical Treatment (~200-500 acres per year)

Flail Mower Excavator

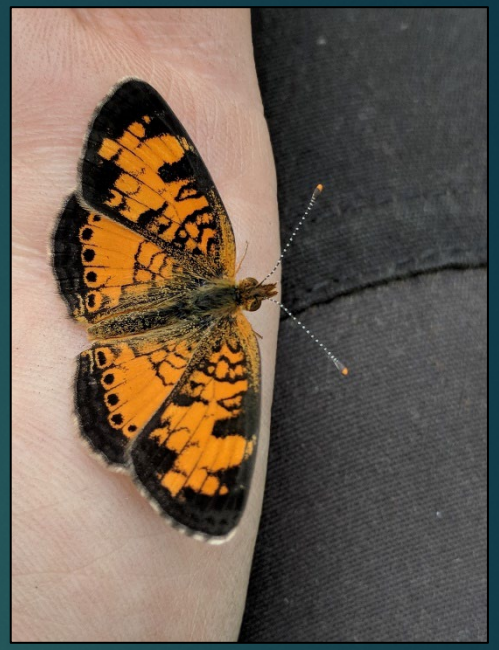
Brush Mower Tractor

Roller Chopper Masticator

Brushsaw and Chain Saws

Project Monitoring

- Rare Butterfly & Other Pollinators
- Sharp-tailed Grouse
- Songbird
- Eastern Bluebird Nest Boxes
- American Kestrel Nest Boxes (Northland College)
- Winter Tracking
- Vegetation & Fire Effects (FIREMON, NRS)
- Uncommon Observations



2016 - 2018 Translocation Project

Translocation

GOAL:

Supplement the existing remnant population of prairie sharp-tailed grouse in the Moquah Barrens.

OBJECTIVE:

Trap and translocate between 150-200 adult sharp-tailed grouse from NW MN to Moquah Barrens within a 2–3-year period.

BENEFITS:

The Moquah population of sharp-tailed grouse will likely disappear without supplementation of additional birds

Anticipated dispersal over time into the Lake Superior grasslands and nearby NW Sands Landscapes.

Where

- Trapping: Roseau, Marshall, Kittson, and Lake of the Woods counties, MN
- Transfer Location: FS Northern Research Station, Grand Rapids, MN
- Vet Clinic: Duluth, MN
- Release Location: FR241 STGR lek, Moquah Barrens

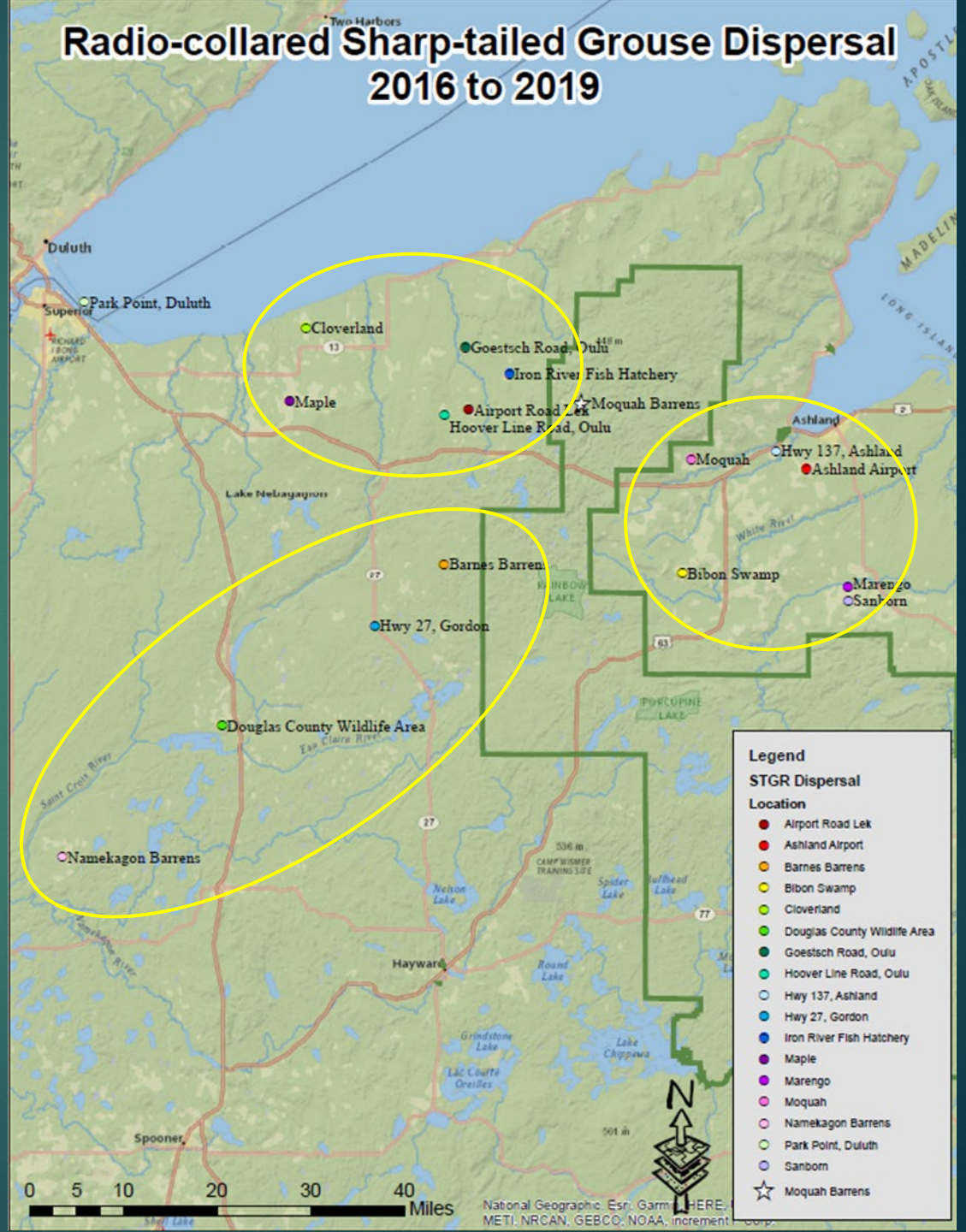
160 sharp-tailed grouse
(66 females, 94 males)

35 translocated birds
(15 females, 20 males)
received VHF transmitters

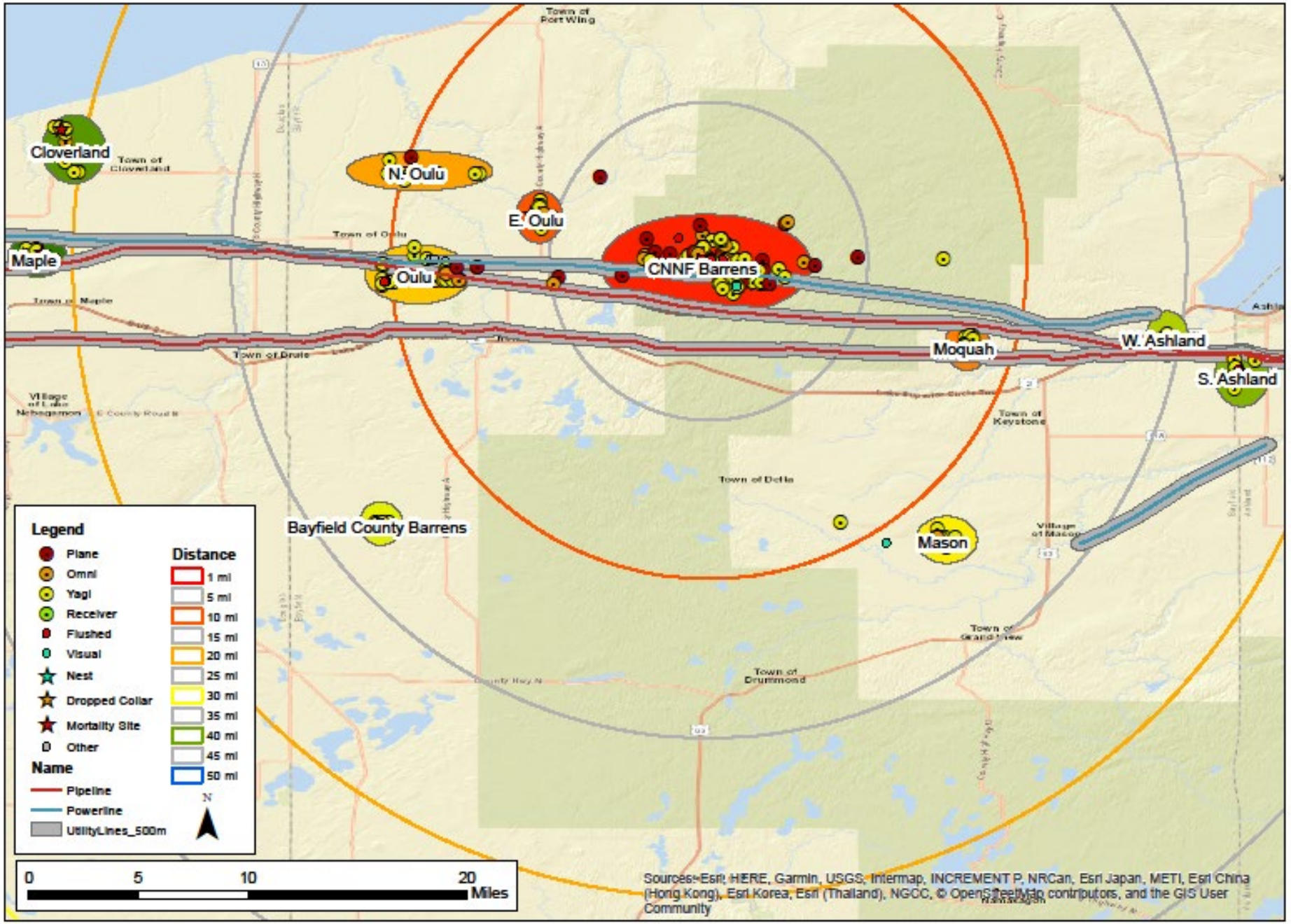

Credit: Charlie Rasmussen - GLIFWC

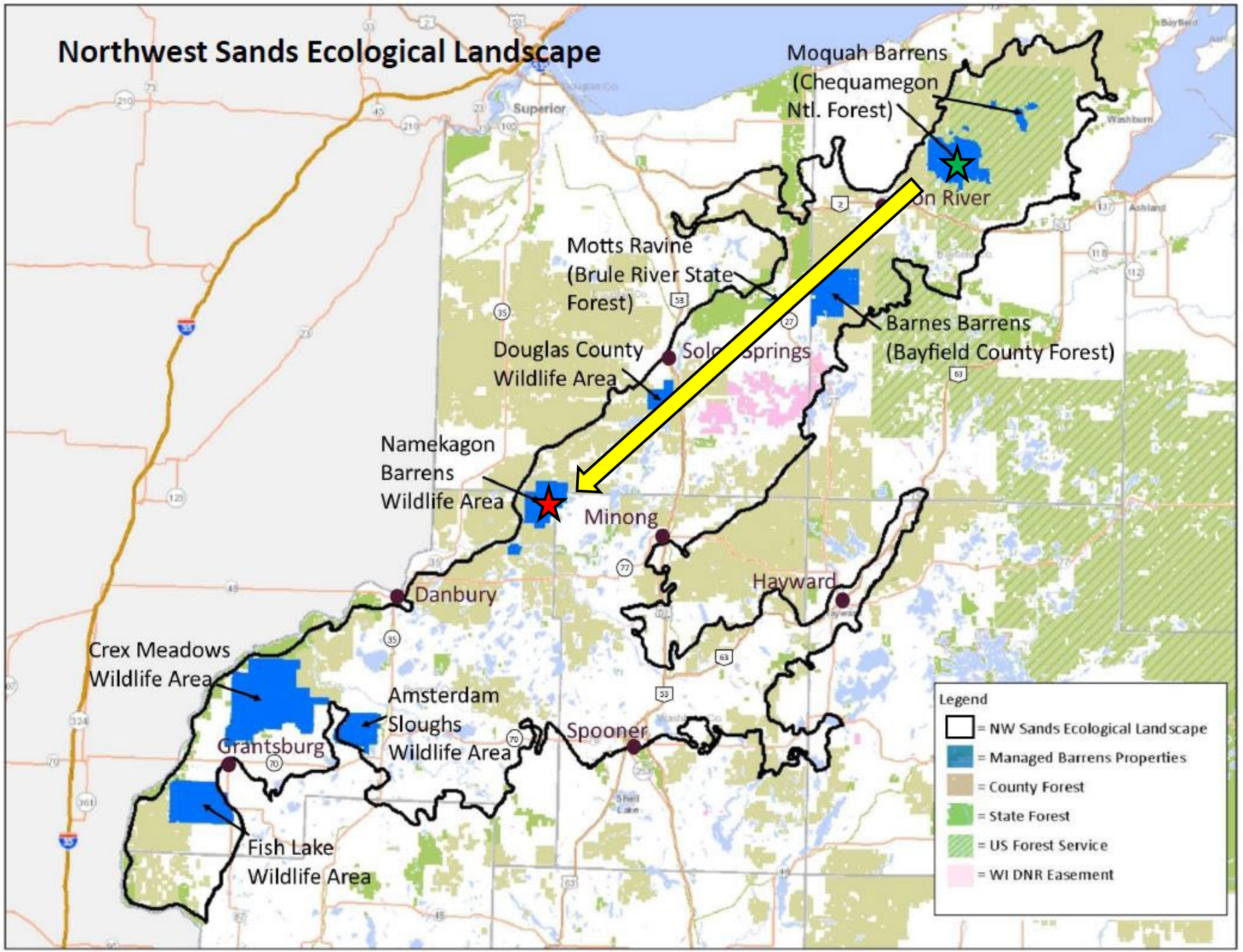
Radio-collared Sharp-tailed Grouse Dispersal

2016 to 2019



2017 - 2018 Locations in Proximity to Utility Lines




Northwest Sands Ecological Landscape
Moquah Barrens
(Chequamegon
Ntl. Forest)
Motts Ravine
(Brule River State
Forest)
Barnes Barrens
(Bayfield County Forest)
Douglas County
Wildlife Area
Namekagon
Barrens
Wildlife Area
Minong
Hayward
Danbury
Crex Meadows
Wildlife Area
Amsterdam
Sloughs
Wildlife Area
Grantsburg
Spooner
Fish Lake
Wildlife Area
Superior
Ashland
Legend
= NW Sands Ecological Landscape
= Managed Barrens Properties
= County Forest
= State Forest
= US Forest Service
= WI DNR Easement

16 M25 Locations 2017-2018

Iron River Fish Hatchery

Approx. 6 miles

Airport Road Lek

Moquah Barrens

Approx. 8 miles

Legend

4590

LocType

- Flushed
- Visual
- Yagi
- Active Leks
- Airport Rd Lek
- Powerline/Pipeline Corridor
- National Forest Boundary
- KDE 50%
- KDE 95%

0 0.5 1 2 3 4 Miles

Minimum Convex Polygons (MCP)

2016-2019

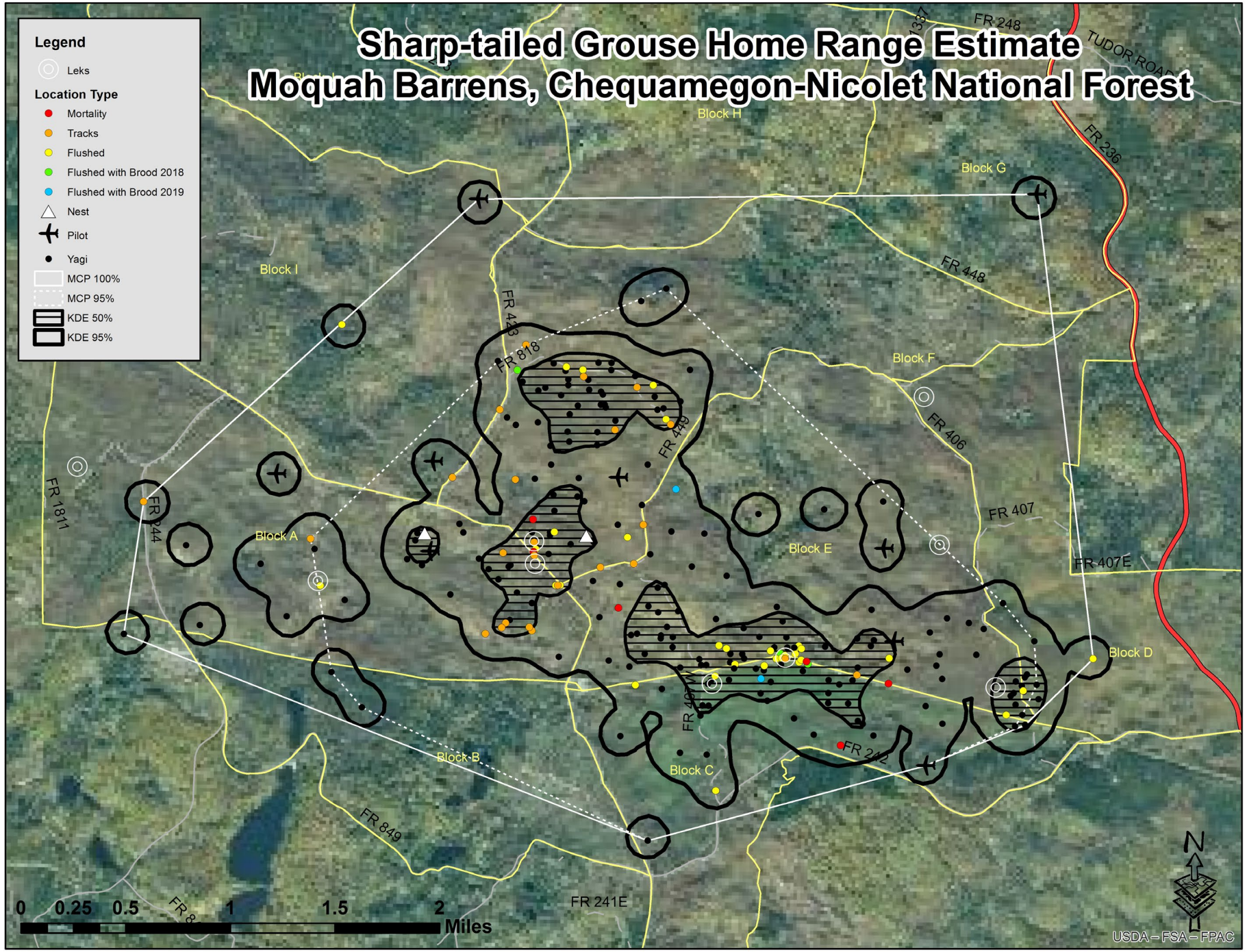
Combined Sex 95%:
3,654 ac (1,479 ha)

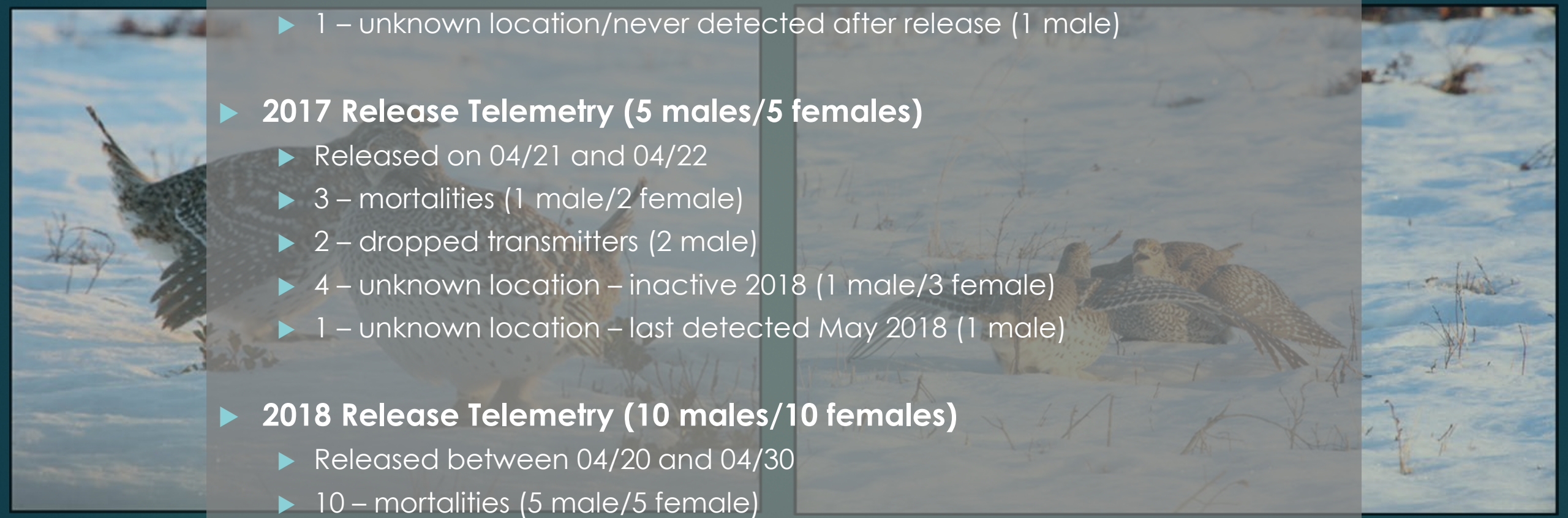
Combined Sex 100%:
6,839 ac (2,768 ha)

<u>For Comparison</u>

Female Only 95%:
2,737 ac (1,108 ha)

Male Only 95%:
2,254 ac (912 ha)





- **2016 Release Telemetry (5 males)**
  - Released between 04/14 and 04/28
  - 3 – mortalities (3 male)
  - 1 – lost signal/low battery – last detected Feb. 2018 (1 male)
  - 1 – unknown location/never detected after release (1 male)

- **2017 Release Telemetry (5 males/5 females)**
  - Released on 04/21 and 04/22
  - 3 – mortalities (1 male/2 female)
  - 2 – dropped transmitters (2 male)
  - 4 – unknown location – inactive 2018 (1 male/3 female)
  - 1 – unknown location – last detected May 2018 (1 male)

- **2018 Release Telemetry (10 males/10 females)**
  - Released between 04/20 and 04/30
  - 10 – mortalities (5 male/5 female)
  - 5 – active in Moquah Barrens (2 male/3 female)
  - 2 – active outside Moquah Barrens (1 male/1 female)
  - 6 – unknown location – last detected May 2018 (3 male/3 female)

Number of Dancing Males Observed on Managed Properties from 2007-2023

Managed Property	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Crex Meadows W.A.	45	40	24	20	16	24	14	5	16	25	22	17	25	25	19	68	76
Douglas County W.A.	28	28	41	36	42	25	25	23	31	24	14	23	25	13	8	6	18
Kimberly Clark W.A.	9	10	10	11	n/a	8	na	3	4	6	0	0	0		0	0	0
Moquah Barrens W.M.A.	6	3	6	7	5	6	3	4	3	2	10	15	23	22	7	3	3
Namekagon Barrens W.A.	51	47	36	43	21	40	42	56	81	62	47	44	53	56	57	66	65
Five Mile Barrens, Brule River LLC																	2
Pershing W.A.	28	27	20	14	9	3	7	5	3	3	1	0	0		1	0	0
Riley Lake W.M.A.	25	27	37	31	15	33	25	19	27	16	21	6	24	12	7	6	12
Dike Seventeen	2	1	1	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a		n/a	n/a	n/a
Barnes Barrens	15	16	27	n/a	n/a	6	8	10	19	31	23	12	11		4	15	19
Total	**209**	**199**	**202**	**162**	**108**	**145**	**124**	**125**	**184**	**169**	**138**	**117**	**161**	**128**	**103**	**164**	**195**
% Change	42%	-5%	2%	-20%	-33%	34%	-14%	1%	47%	-8%	-18%	-15%	38%	-20%	-20%	59%	19%

Table from WDNR 2023 Wisconsin Sharp-tailed Grouse Survey Report (https://widnr.widen.net/s/ttd9qqcb9q/sharptailedgrouse_survey_2023).

Potential Reasons for Declining to Stable Low Population Numbers
~ Working to Find the Answer ~

- Effects of management actions – level, intensity, timing, influence of other focal species
- Potential effects of management actions occurring during and in the years immediately following the translocation effort
- Influence of increasingly variable weather conditions during critical times of year
- Habitat conditions at lek and surrounding area – finding the right open to brush ratio
- Poor functional connectivity to other populations of sharp-tailed grouse
- Inadequate public education (e.g., hunters mistaking them for ruffed grouse)
- Increased human disturbance during critical times of year (e.g., illegal off-trail snowmobile)
- Density of Predators (fishers, coyotes, wolves, wild turkeys, northern harrier)

Lessons Learned & Topics for Further Discussion

- Have a well-developed plan for not only capturing birds, but also release and follow-up monitoring.
- Ensure personnel are available to cover the amount of work involved and have a solid commitment of support from leadership.
- Ensure that habitat is ready to receive birds and consider the condition of this habitat in relation to the habitat that the birds are being taken from – anecdotal evidence that the MN birds left Moquah in search of something that was more like what they knew.
- Partnerships are key to success. Start fostering relationships early, maintain open communications, and establish clear expectations.
- Consider and try to anticipate how management for other species may influence or create challenges in managing for the translocated species and vice versa.
- When planning for a translocation, work with key partners early and often, advocate for continued assistance through the entire project from planning to conclusion.

Received: 20 September 2022 | Revised: 8 March 2023 | Accepted: 3 April 2023
DOI: 10.1111/csp2.12937

INNOVATIONS IN PRACTICE

Conservation Science and Practice
WILEY

Predicting and prioritizing genetic diversity outcomes of animal translocations

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Funding information
Great Lakes Restoration Initiative; U.S. Forest Service; United States Deparatment of Agriculture Joint Chiefs Initiative; Wisconsin Sharp-tailed Grouse Society

KEYWORDS: augmentation, connectivity, genetic diversity, reintroductions, sharp-tailed grouse, simulations, translocation, *Tympanuchus phasianellus*

1 | THE PROBLEM

Environmental change is driving extinctions and isolating species globally; recovering and rescuing these populations has motivated conservation for over a century (Seddon et al., 2014). Traditionally, recovery to self-sustaining populations have focused on habitat management approaches that ultimately increase the survival and reproduction of the at-risk population. However, genetic diversity is increasingly recognized as an integral component of long-term species recovery from past changes and to provide adaptive capacity to future change (Jamieson & Lacy, 2012). Indeed, population declines, and isolation has reduced genetic diversity and increased inbreeding that escalates the extinction risk for translocations can improve fitness through the introduction of new genetic material when the recipient population is small or inbred and improve adaptive potential by increasing genetic diversity (Weeks et al., 2011; Whiteley et al., 2015). While increasing genetic diversity is often cited as a fundamental goal of translocations, the effectiveness is often not evaluated (but see Jackson et al., 2022).

Improving genetic diversity hinges on selecting an appropriate source population and identifying the correct number of individuals to be translocated; conservation practitioners, though, rarely have prior knowledge on the genetics of translocated individuals to inform either condition (Tracy et al., 2011). Even when known, the persistence of genetic diversity in the recipient population is often unexplored. By combining genetic data on the

https://doi.org/10.1111/csp2.12937

Genetic Evaluation

Predicting and prioritizing genetic diversity outcomes of animal translocations

Smith, M. M., Knife, C. G., Eklund, D., Heeringa, B., & Pauli, J. N. (2023). Predicting and prioritizing genetic diversity outcomes of animal translocations. Conservation Science and Practice, 5(6), e12937. https://doi.org/10.1111/csp2.12937

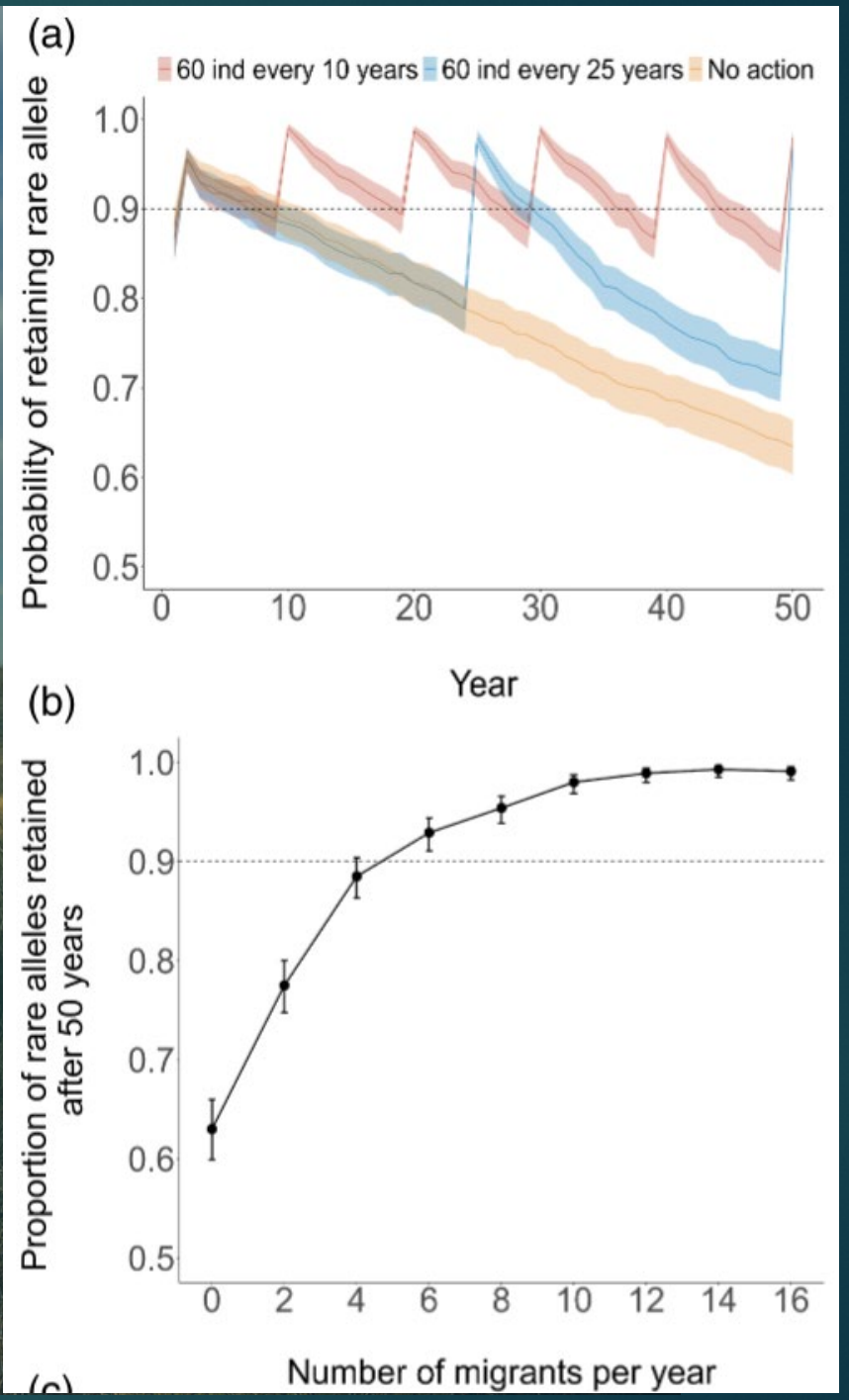
While increasing genetic diversity is often cited as a fundamental goal of translocations, the effectiveness is often not evaluated (see also Jackson et al., 2022).

Source population exhibited high-genetic diversity, making it an ideal source for the translocation (Rog & Gregory, 2019)

Predicting and prioritizing genetic diversity outcomes of animal translocations - continued

- Quantified the genetic diversity of translocated individuals, and then simulated how genetic diversity would erode over time under different scenarios: single translocation, additional augmentations, and rates of natural immigration.

- Simulations revealed genetic diversity, measured as retention of rare alleles of the recipient population, would:
  - Erode rapidly if no further management actions were taken
  - Increase but eventually erode due to small population size with augmentations at 10- or 25-year frequencies
  - Be retained with only 4 migrants per year



Predicting and prioritizing genetic diversity outcomes of animal translocations - continued

- Increased connectivity was necessary to maintain genetic diversity and translocation alone, even at relatively high frequency, were subject to genetic loss without consistent natural immigration.

- Promote genetic diversity of translocations by:
  1. Sourcing individuals from a genetically diverse population
  2. Releasing a sufficient number that captures the genetic diversity of the source pop.
  3. Choosing a reintroduction site with connectivity to neighboring populations
  4. Evaluating the loss of genetic diversity through simulations to guide management
  5. Monitoring for genetic diversity following translocation

- Explicitly incorporate genetic diversity into management plans and evaluate alternative strategies; adapting strategies following monitoring that promote long-term persistence of genetic diversity.

Contracted Barrens Lepidoptera Surveys 2019 – 2023

Focus of surveys is to confirm presence of Chryxus artic
Is a Forest Service R9 Regional Forester Sensitive Species on CNNF

No Chryxus arctic have been documented by Forest Service, contract surveyors, or reports from the public since 2009 except for 1 possibly in 2021.

From 2019-2022:

182 species were documented
40+ species are barrens affiliated/related
At least 10 species are restricted to barrens/savanna

Some Rare/Uncommon observations: Western Tailed Blue, Hoary elfin, Olympia marble, Boreal Pine Looper Moth, *Prionapteryx nebulifera*, *Exaeretia canella*, Yellow-banded Bumble Bee, Brown Belted Bumble Bee, Northern Barrens Tiger Beetle

Note: from 2009-2019 at least 225 species of lepidoptera were documented

Project Partners

- Wisconsin Department of Natural Resources
- Bad River Band of Lake Superior Chippewa
- Red Cliff Band of Lake Superior Chippewa
- US Forest Service Northern Research Station
- US Fish and Wildlife Service
- Northland College
- Lake Superior Collaborative/My Lake Superior Northwoods
- Great Lakes Indian Fish and Wildlife Commission
- Wisconsin Sharp-tailed Grouse Society
- Minnesota Sharp-tailed Grouse Society
- Minnesota Department of Natural Resources
- Michigan State University
- National Wild Turkey Federation

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