

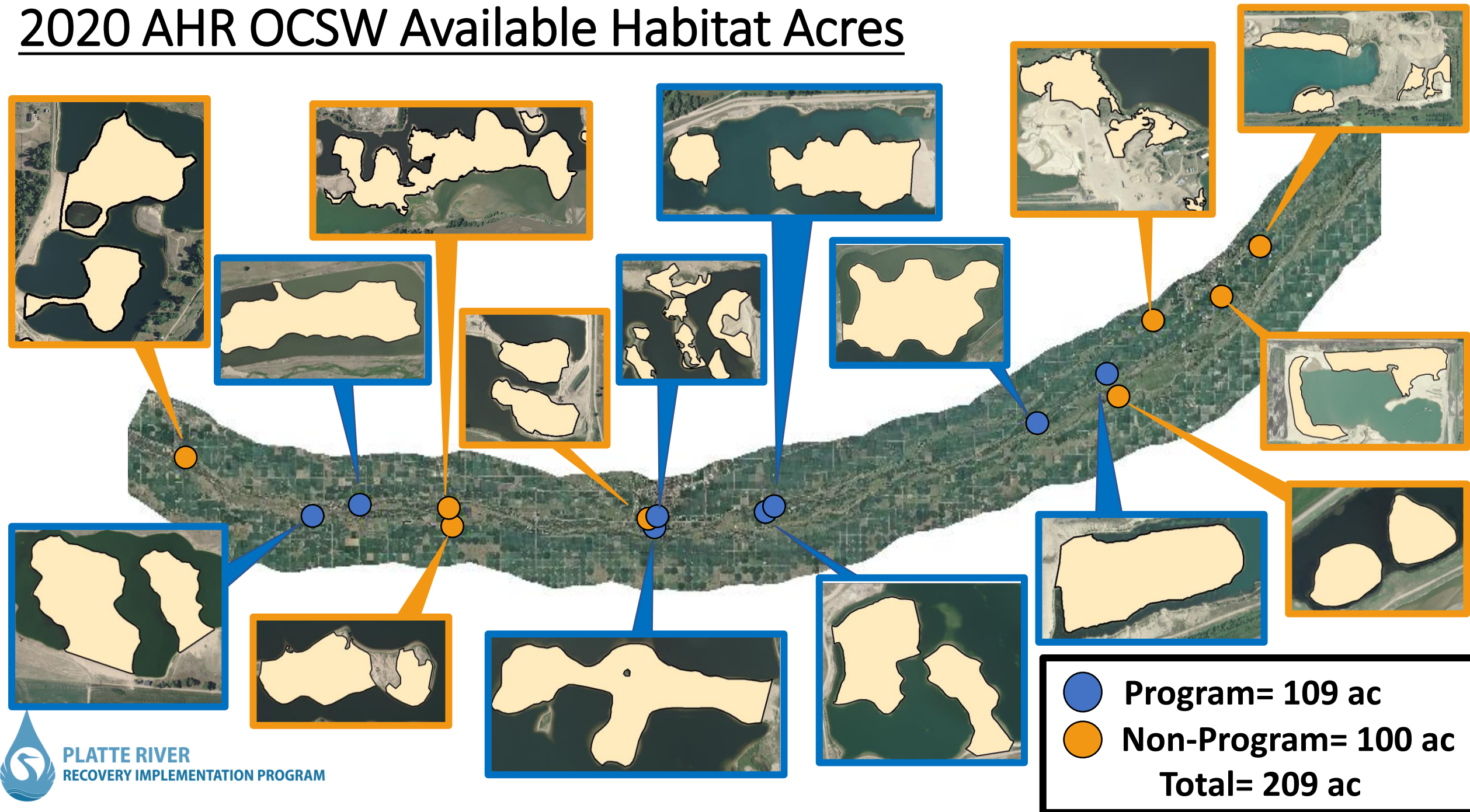
Least Tern and Piping Plover Update

Kari Mohlman

Biologist

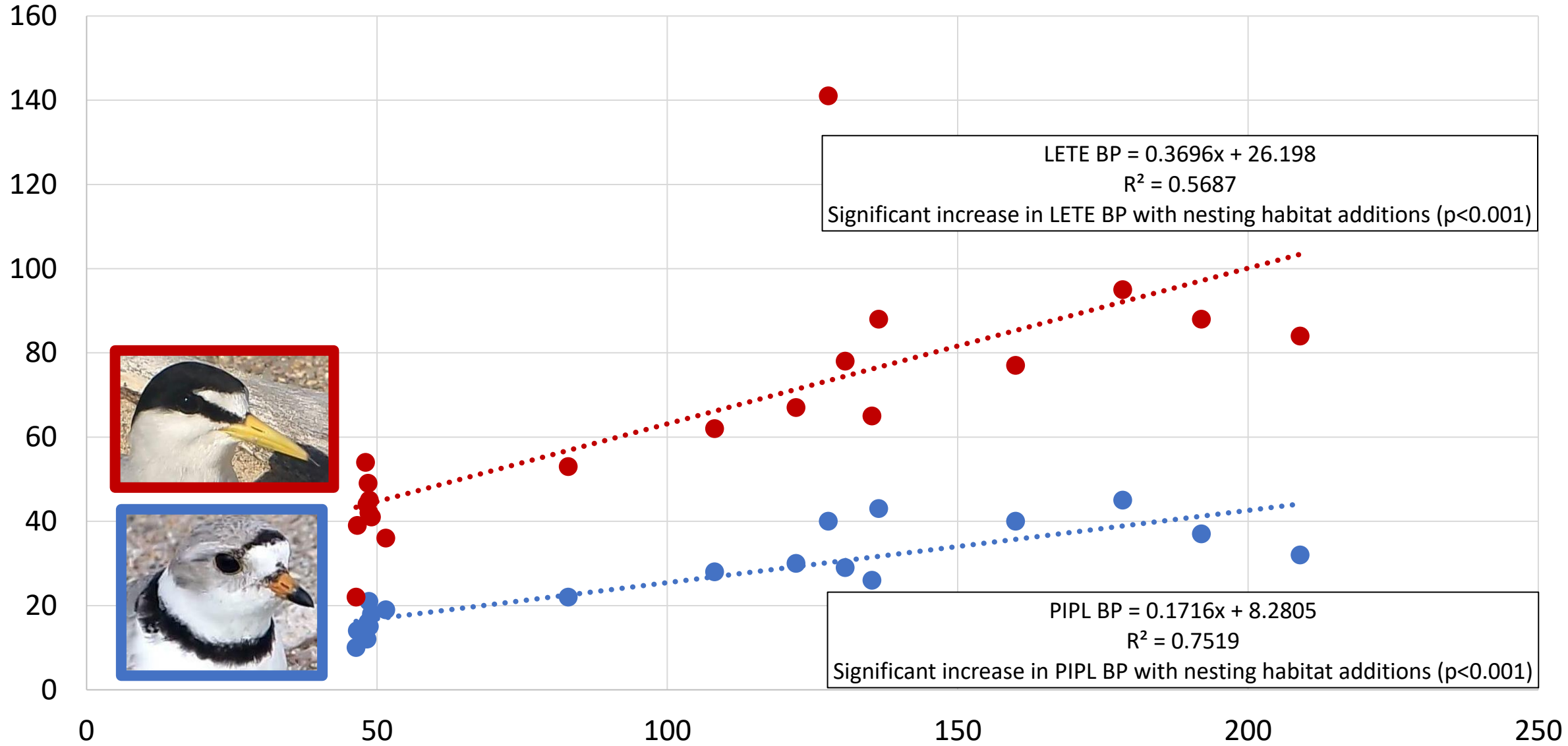
LTPP Lead

2020 AHR OCSW Available Habitat Acres



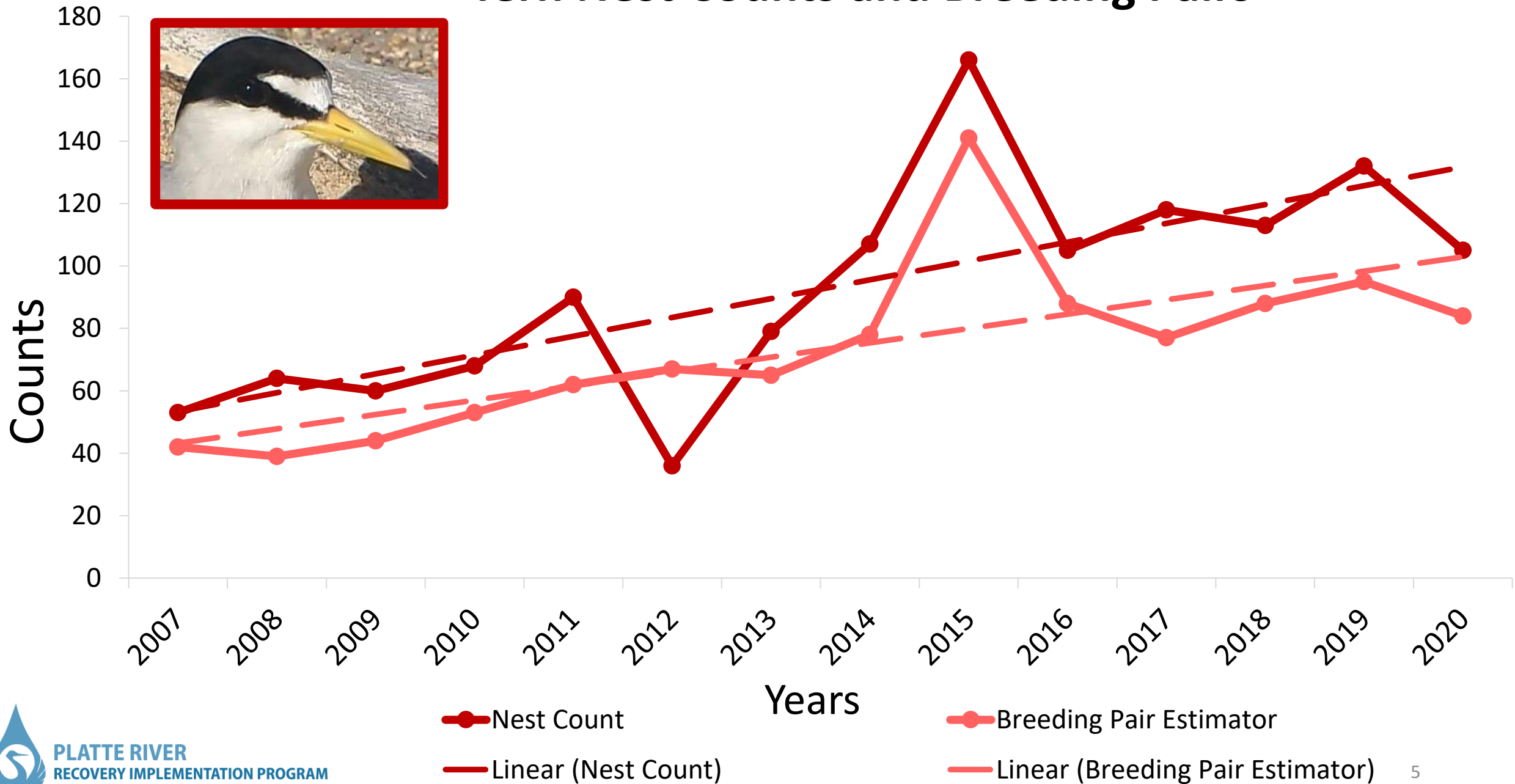
Tern and Plover Breeding Pair Reaction to Habitat Additions

Annual Breeding Pair Estimate

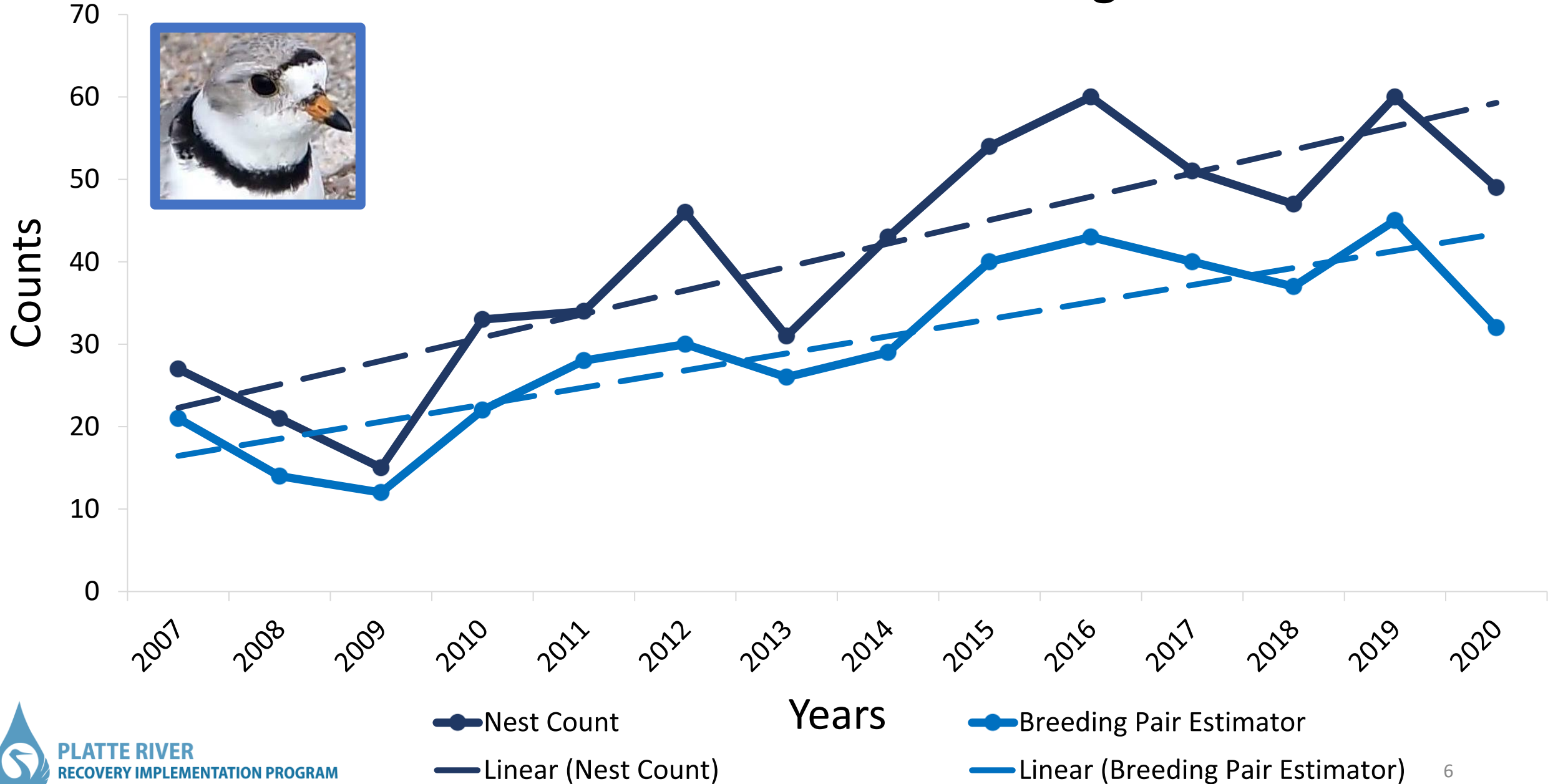
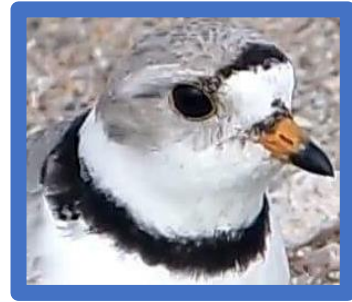


Acres of Nesting Habitat

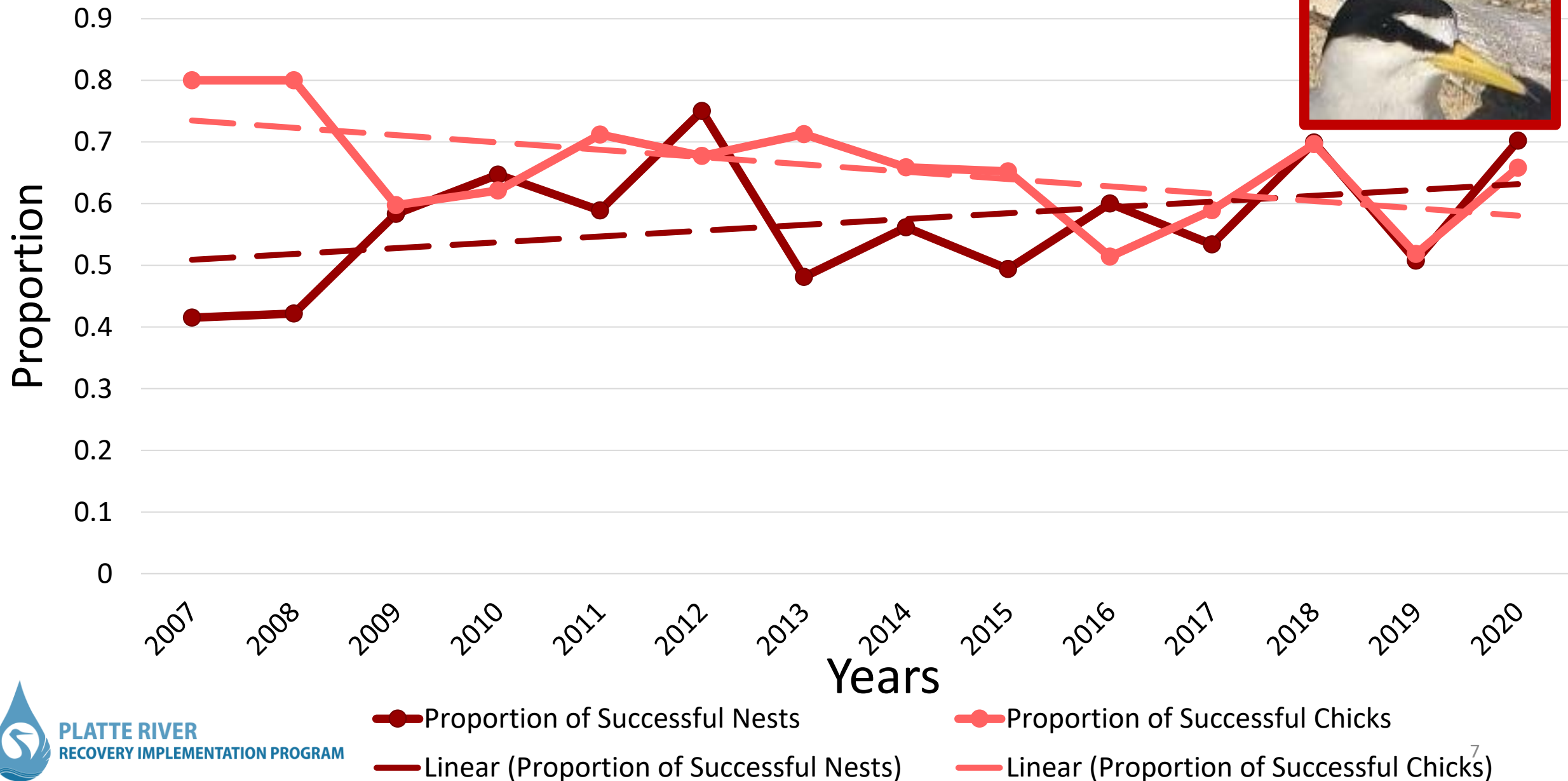
Tern Nest Counts and Breeding Pairs



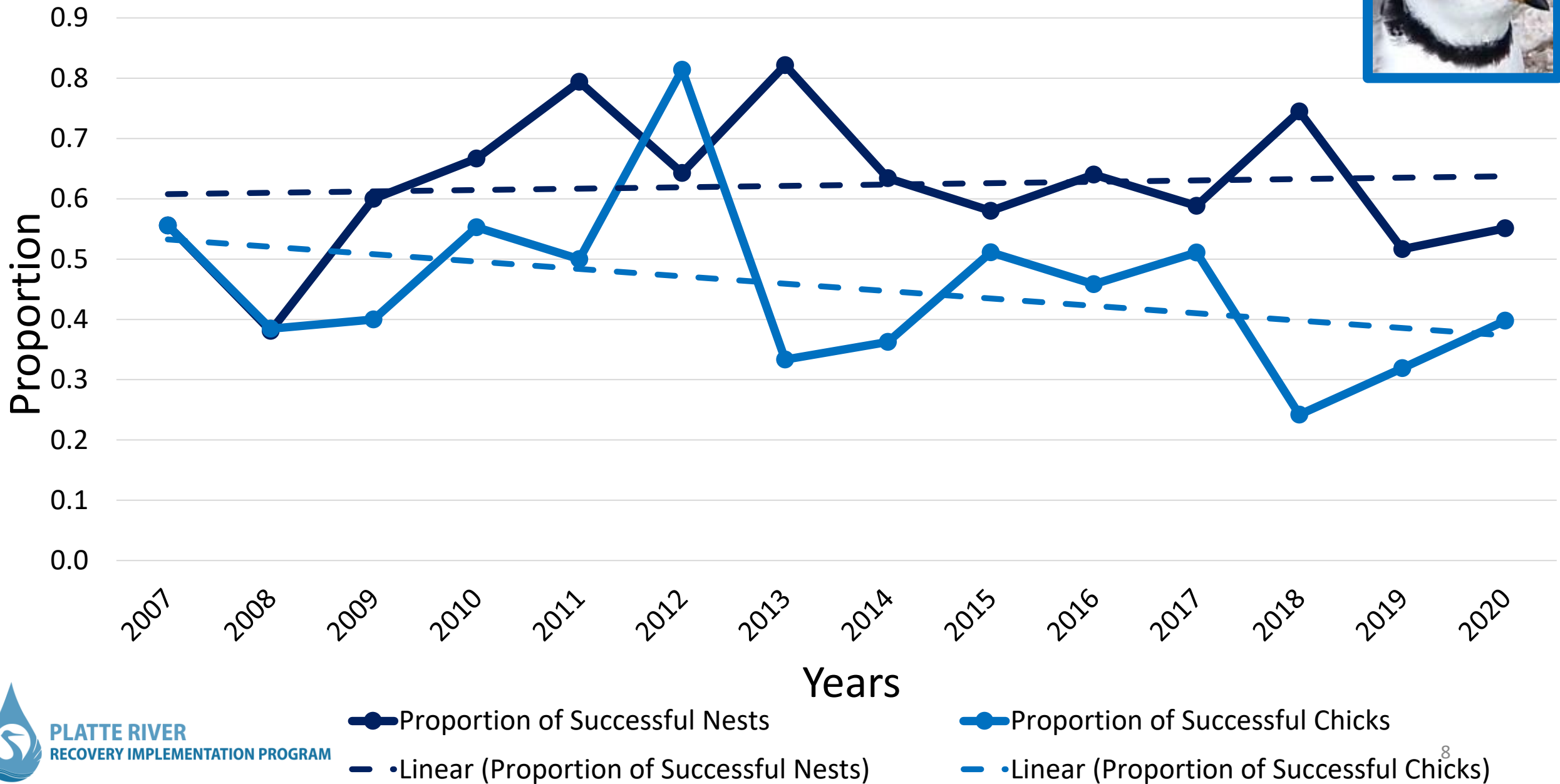
Plover Nest Counts and Breeding Pairs



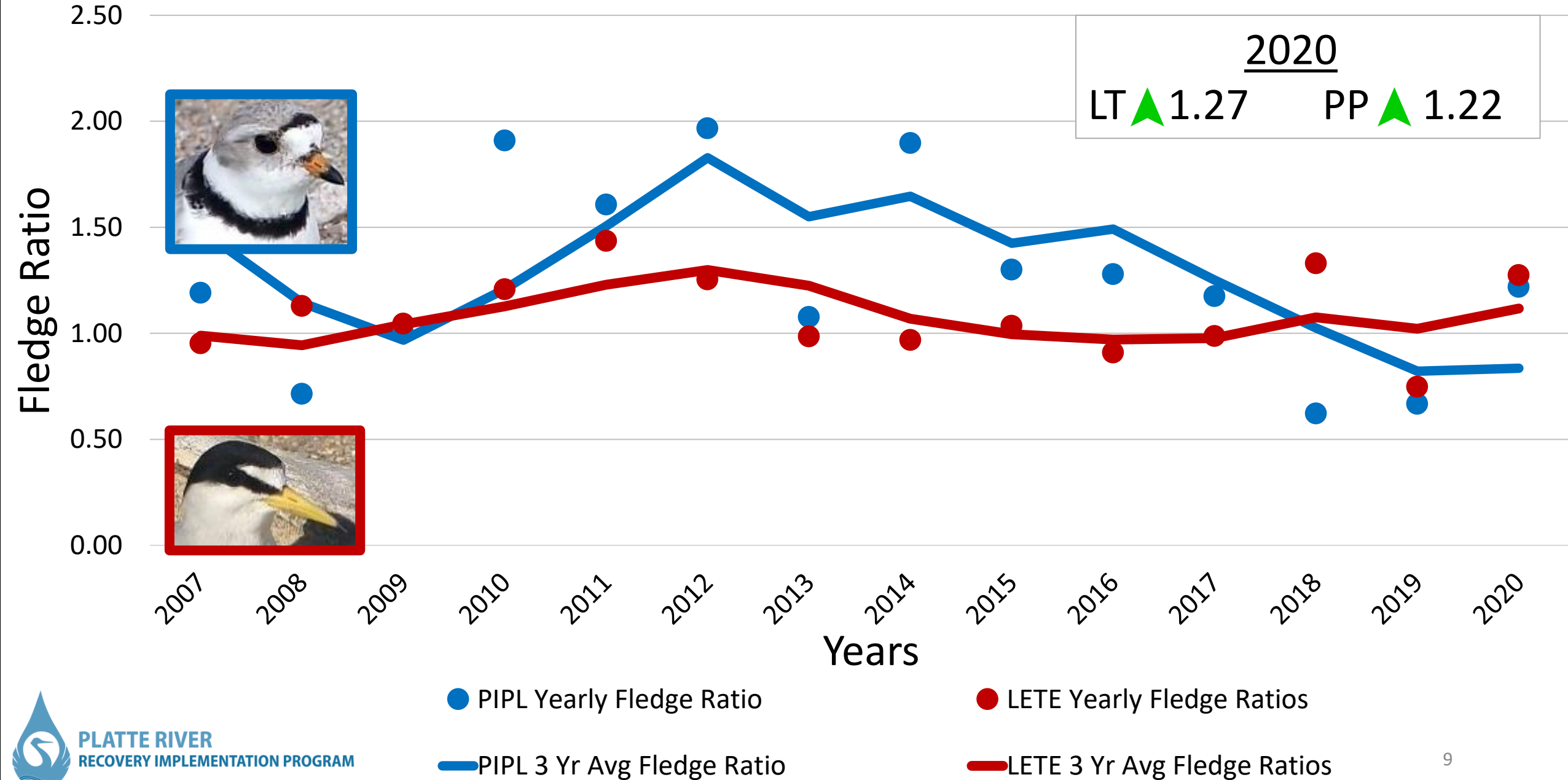
Tern Proportion of Successful Nests and Chicks



Plover Proportion of Successful Nests and Chicks



Fledge Ratios



Failed Nests and Broods Terns and Plovers

Status	2019	2020
Predated	23	17
Weather/ Flooding	18	0
Failed Unknown	87	59
Abandoned	1	3
Total	129	79



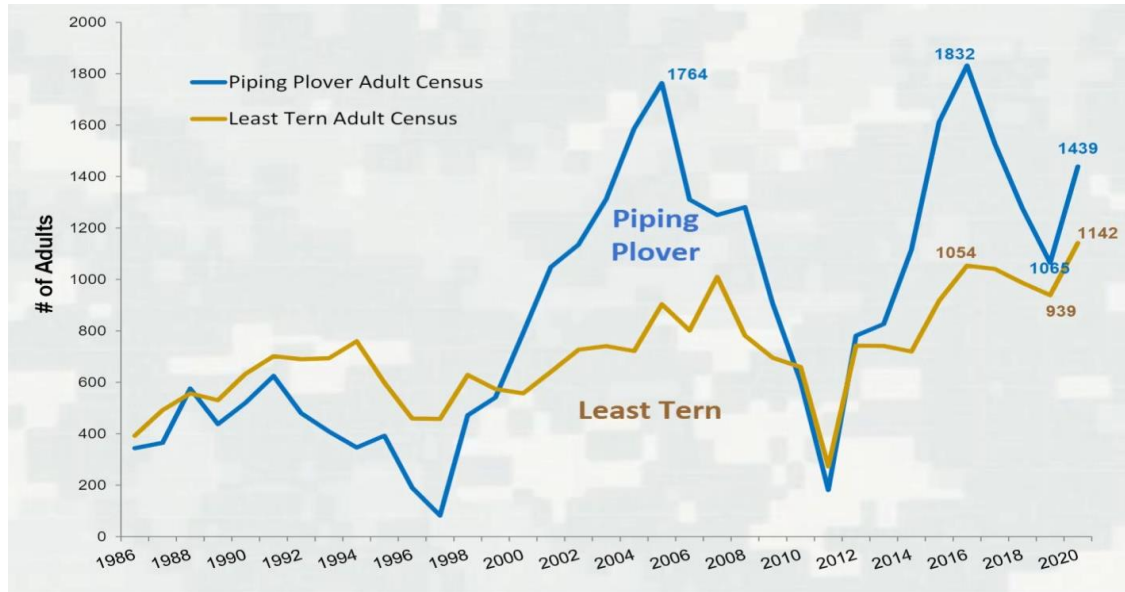
A fluffy, downy bird chick, possibly a sandpiper or similar shorebird, is resting on a bed of small, light-colored pebbles. The chick is positioned in the upper center of the frame, facing right. Its body is covered in soft, greyish-brown down. The pebbles are small and rounded, in shades of tan, brown, and grey. A white rectangular box with a black border is overlaid on the lower half of the image, containing the text "2020 Season Conclusion".

2020 Season Conclusion



Population Metric Variability

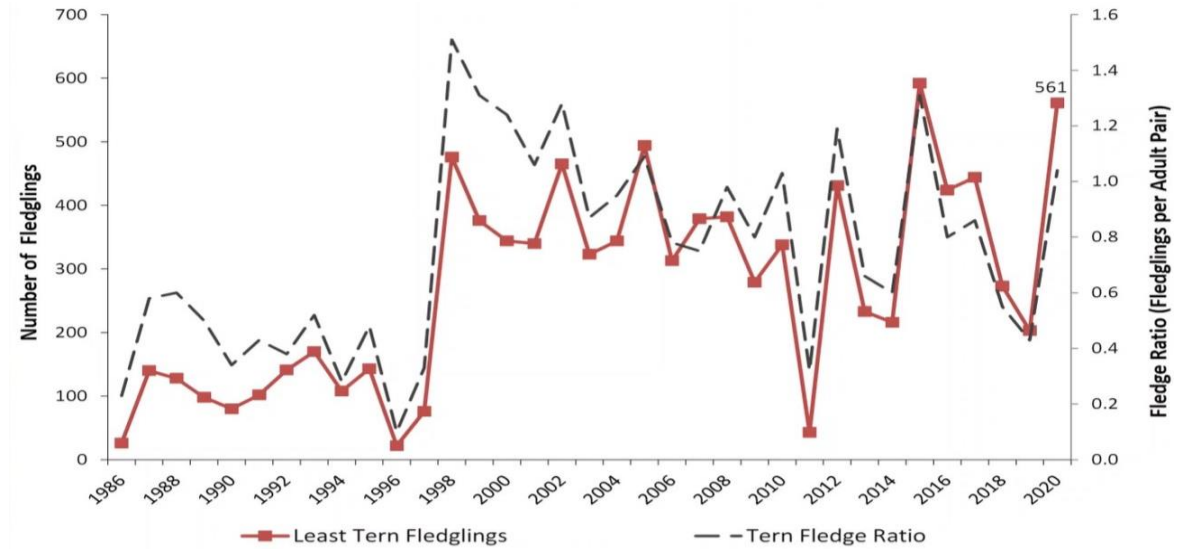
USACE Least Tern and Piping Plover Adult Census



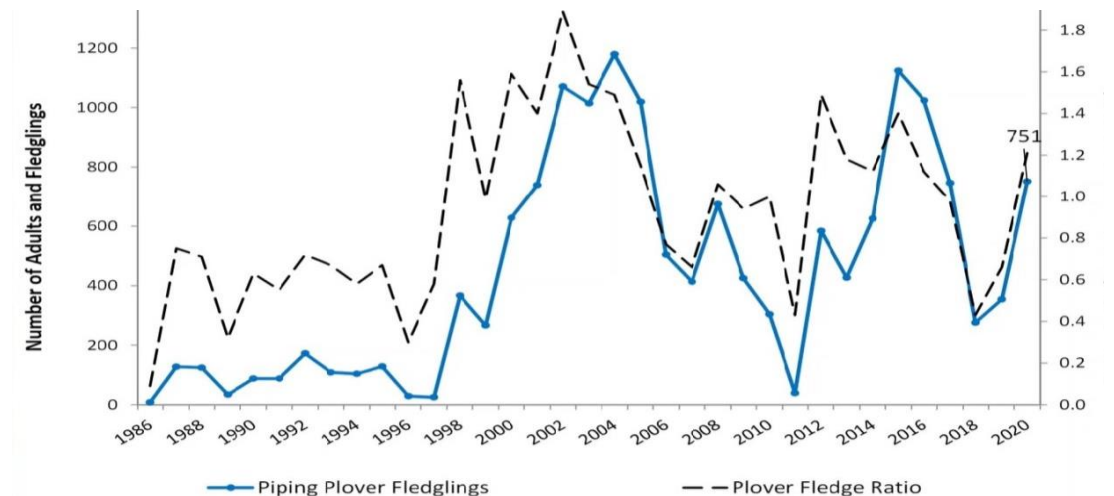
Reference:

Hofer C. 2020 Missouri River tern and plover monitoring program data summary. USACE. Unpublished data presented at MRRIC 2020 Fall Science Meeting, 3 November 2020.

Missouri River Least Tern Fledglings

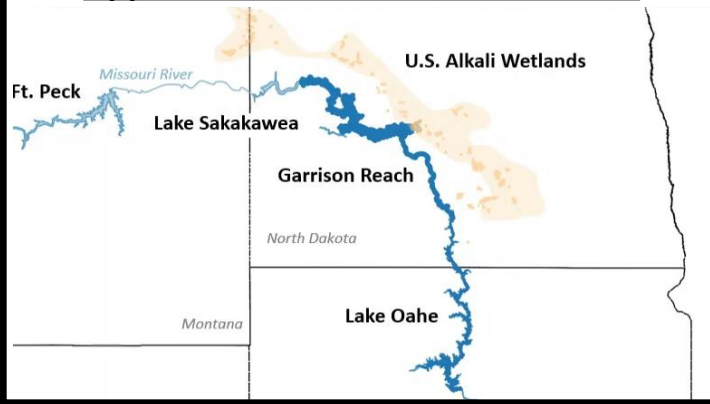


Missouri River Piping Plover Fledglings



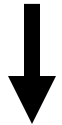
Great Plains and Great Lakes Populations

Upper Missouri and Alkali Wetlands



Hofer 2020, USACE 2020

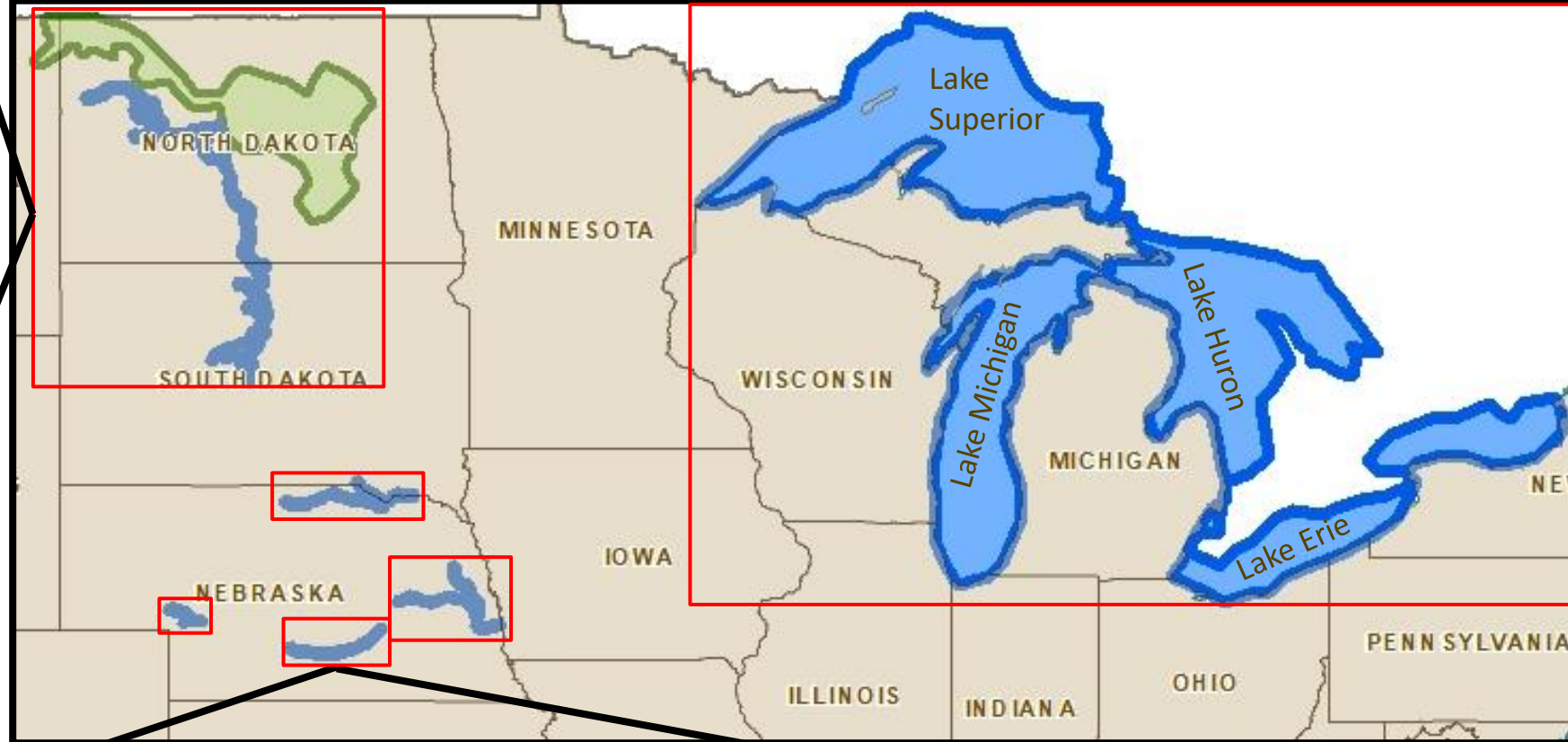
**2018-2019
High Flows** ↑



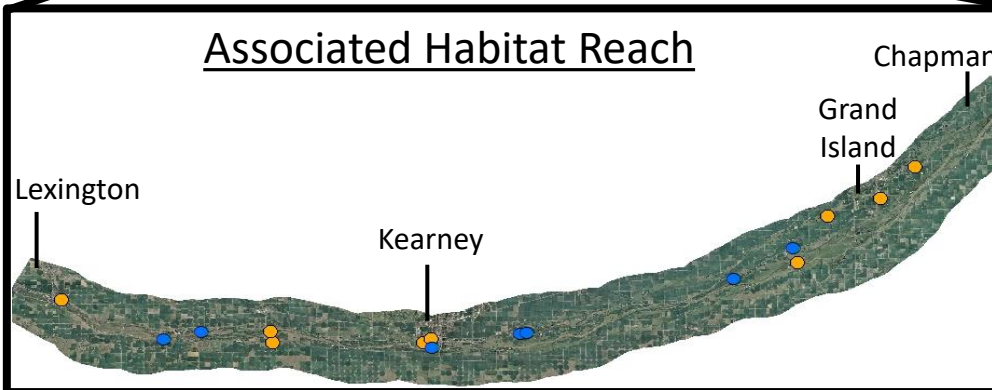
**2020
Higher
Habitat
Availability** ↑



**2020
Increased
Adult
Count and
FR** ↑



Associated Habitat Reach



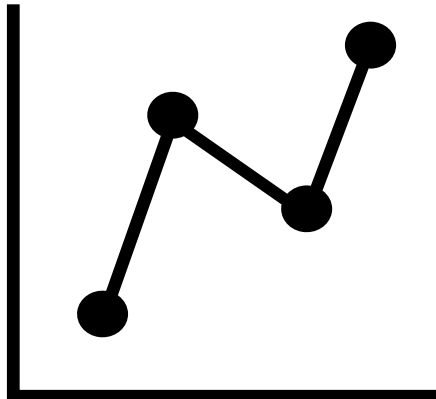
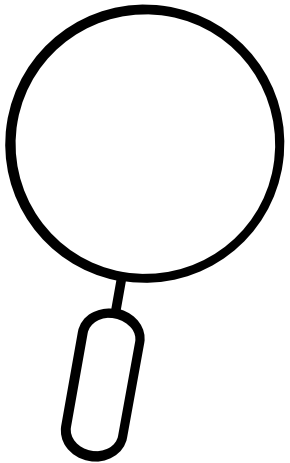
**2020
Lower
Adult
Counts** ↓



**Flooding,
Weather, &
Predation in
2019 OR Increase
in Habitat in
Other Areas
???**

Moving Forward

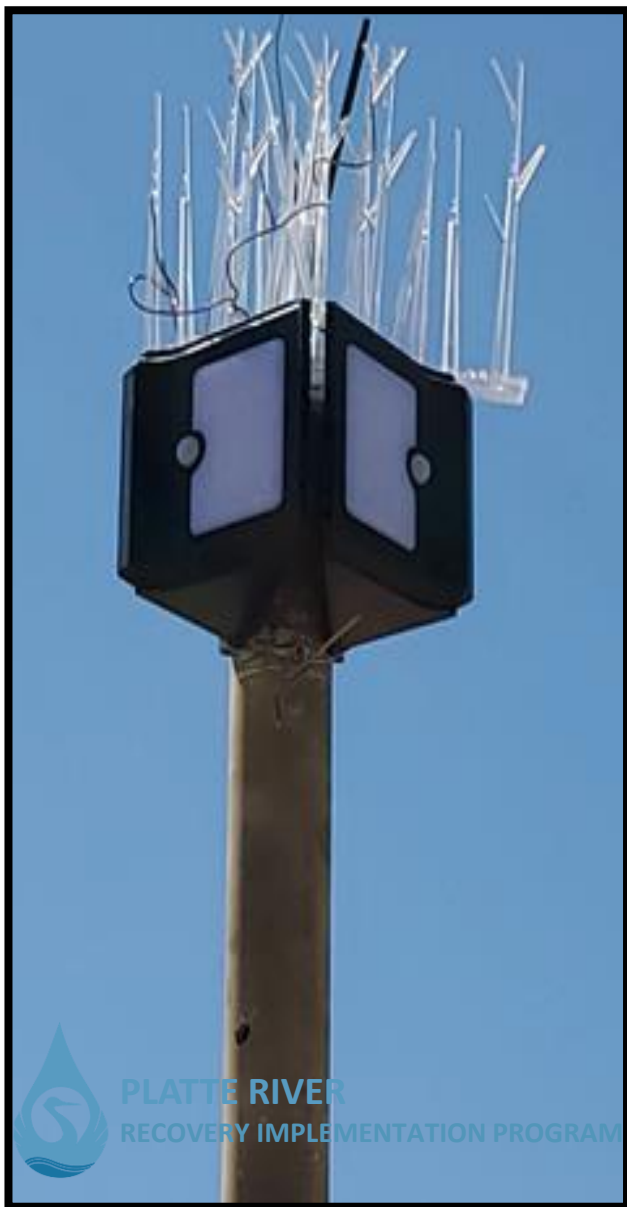
- Big picture
- Develop performance indicators and acceptable ranges
- Interior Least Tern delisting



Skunk predating a softshell turtle nest at Blue Hole.



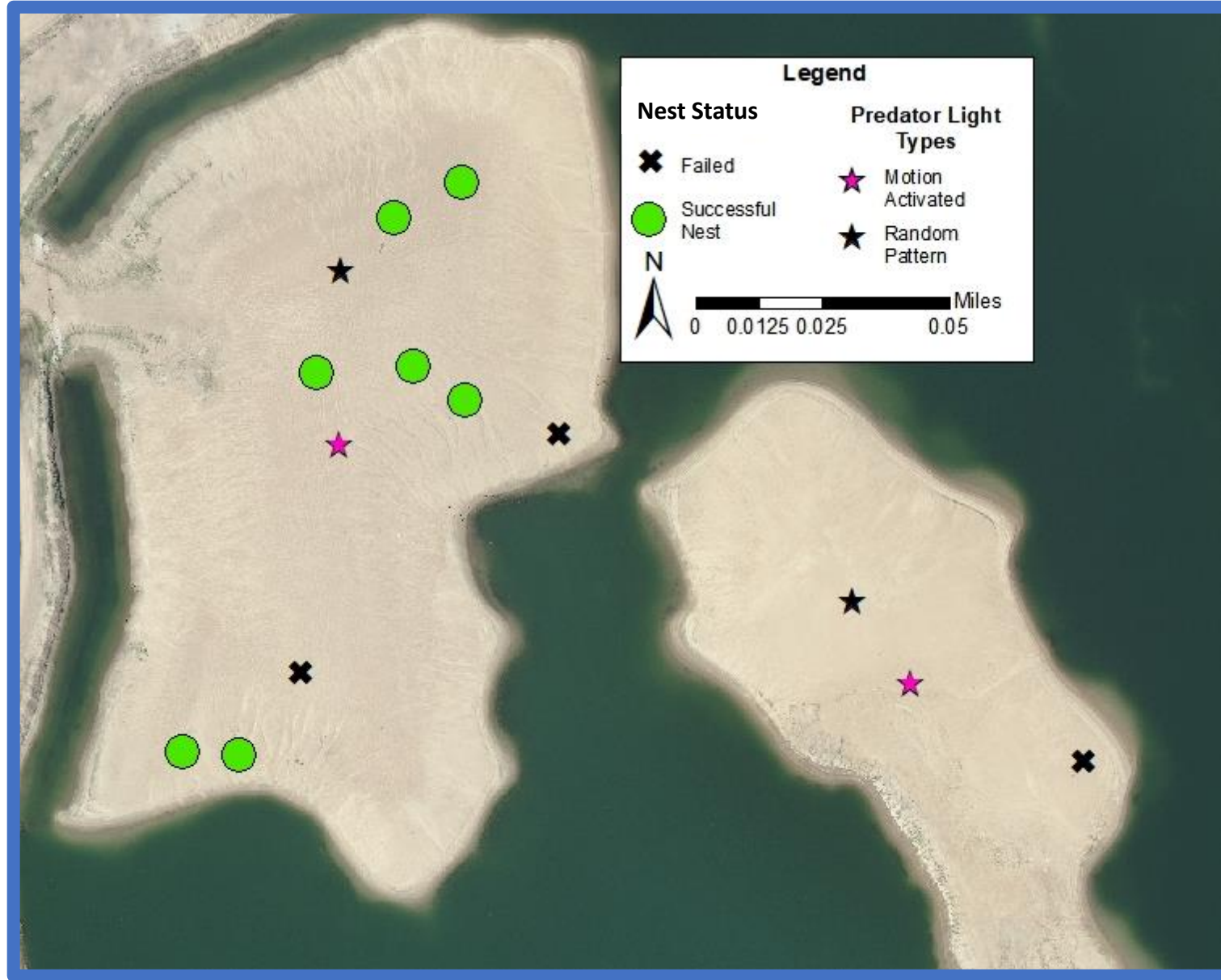
Additional Predator Management



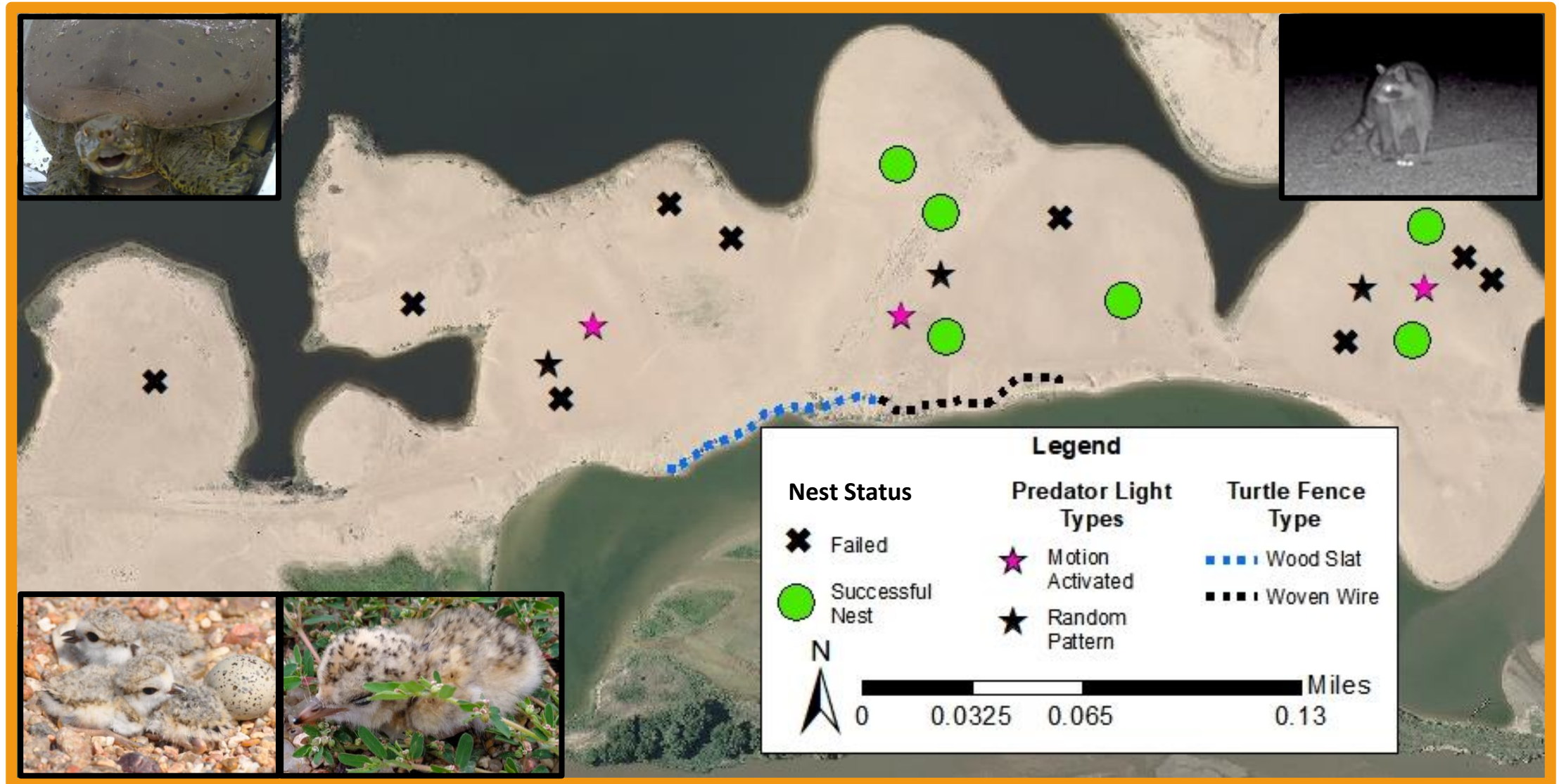
Broadfoot Kearney-South



Newark West



Blue Hole



Conclusion





Predator Camera Research and Monitoring at Least Tern and Piping Plover Off-channel Nesting Sites

Kaley Keldsen
Wildlife Biologist



PRRIP

Predator Management

- Nesting peninsula moats
- Predator fence
- Panel wings
- Tree removal
- Avian spikes
- Terrestrial predator trapping and removal



➡ Predator Panel Wing Monitoring



➡ Site Level Predator Monitoring



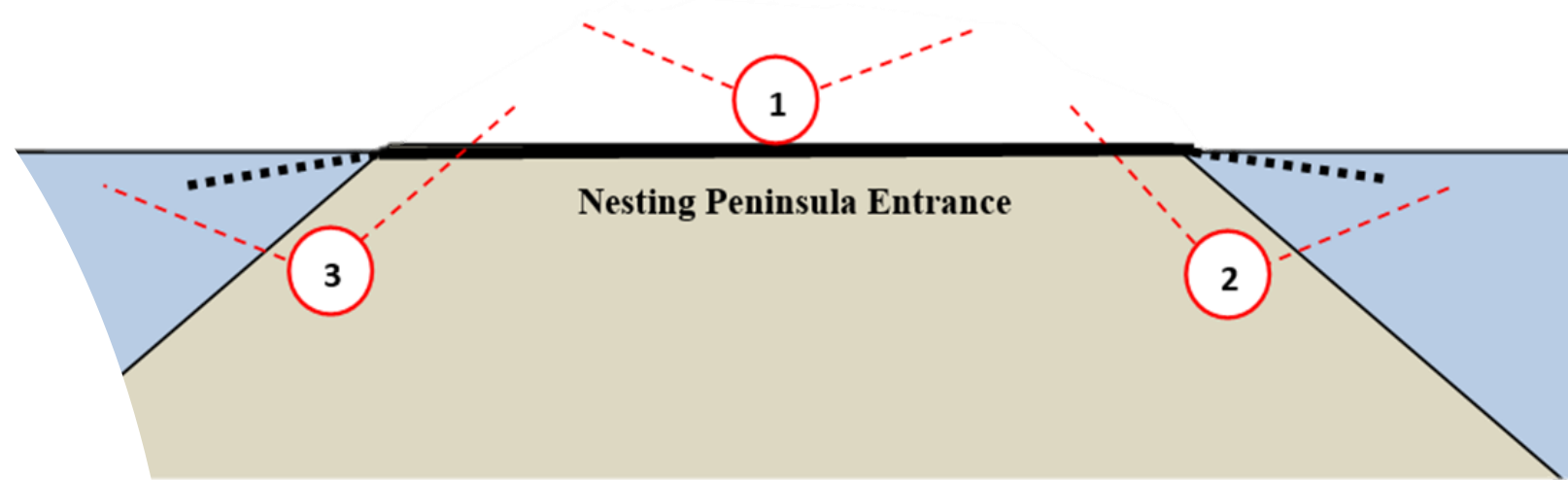
➡ Nest Predator Monitoring



Predator Panel Wing Monitoring

2017 - 2018

- Document approaches and breaches
- Predator communities
- Dyer, Broadfoot – Kearney South, and Leaman



Approaches (90%)



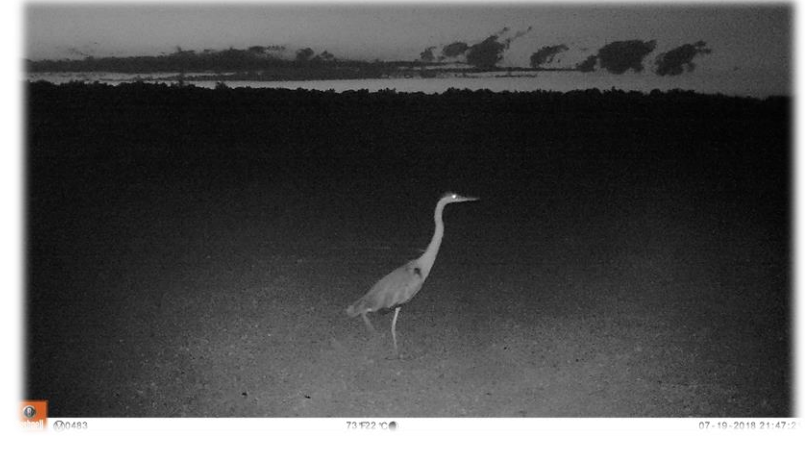
Breaches (10%)



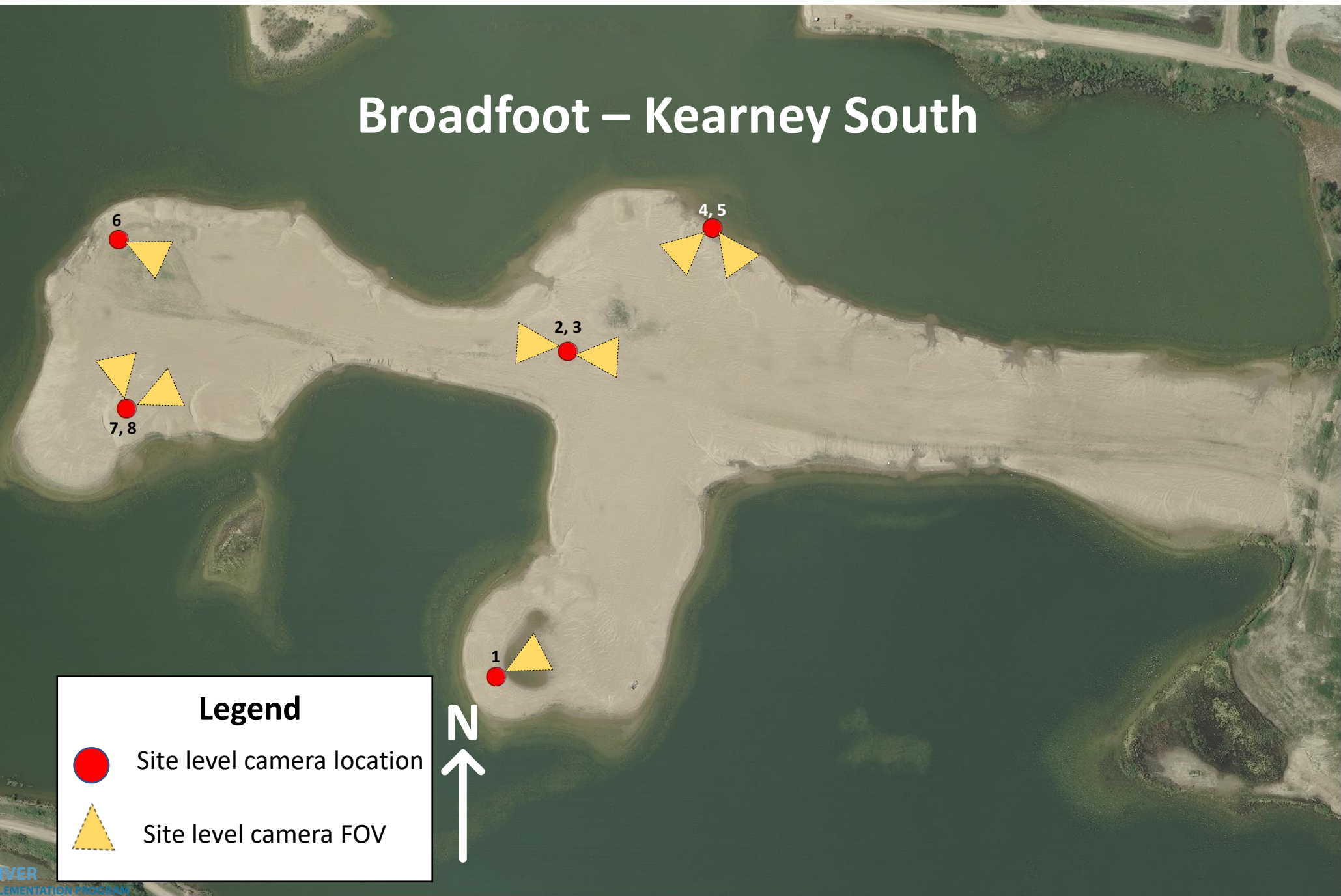
Site Level Predator Monitoring

2017 - 2018

- Terrestrial and avian predator presence
- Terrestrial predator registers > avian predator registers?



Broadfoot – Kearney South



Terrestrial

Unknown Terrestrial Predator
Coyote
Skunk
Raccoon
Badger
Bobcat
Red Fox
Opossum
Snake
Otter

BFS
Blue Hole
Dyer
Leaman
Lexington

Avian

Great Horned Owl
Seagull
Sub Adult Bald Eagle
Heron
Unknown Avian Predator
Adult Bald Eagle
Crow
Red Tailed Hawk
Barn Owl
Turkey Vulture
Osprey

0 10 20 30 40 50 60

Nest Predator Camera Monitoring

2019-2020

- Investigate and capture nest predation events
- Determine predator communities

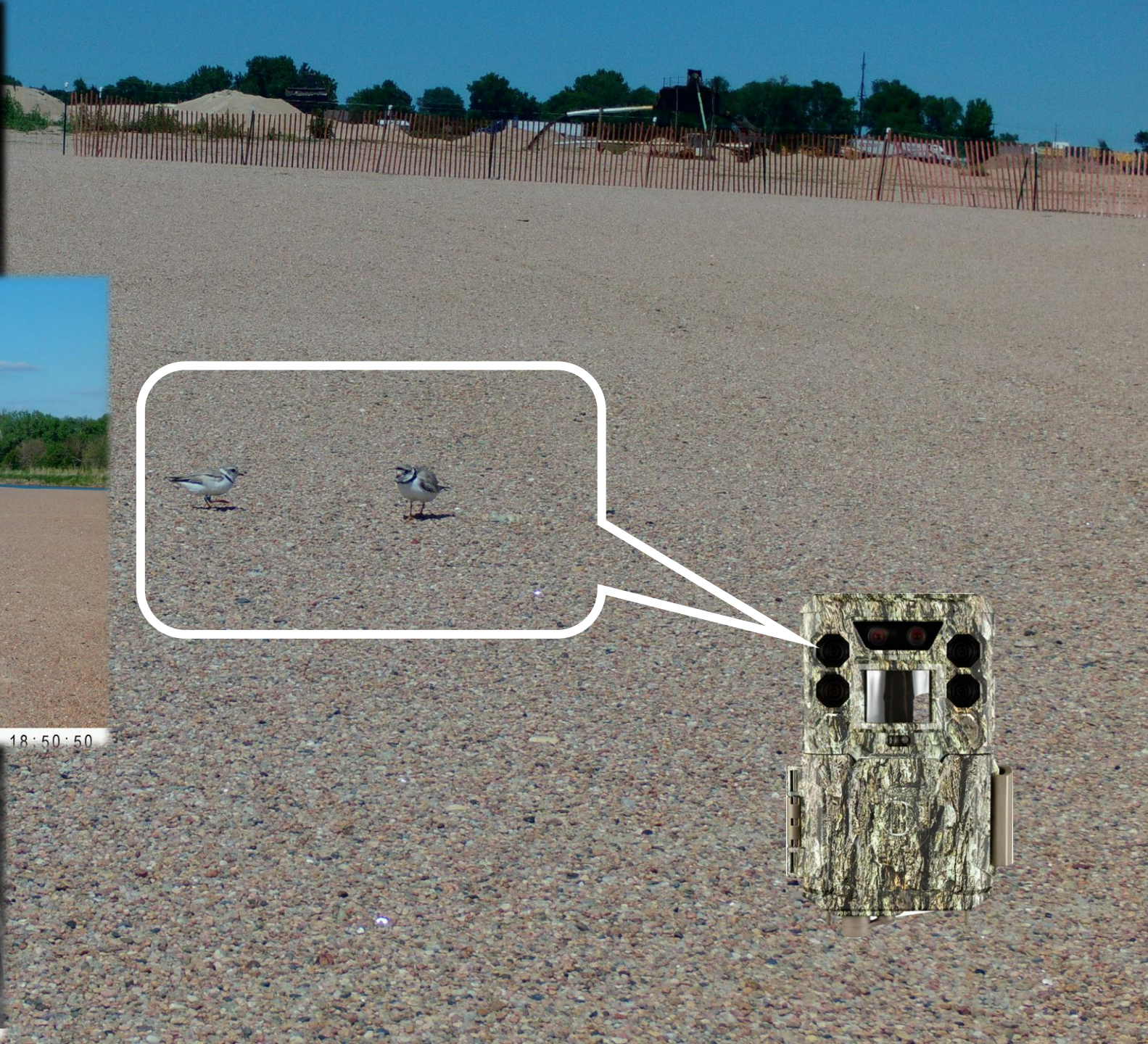




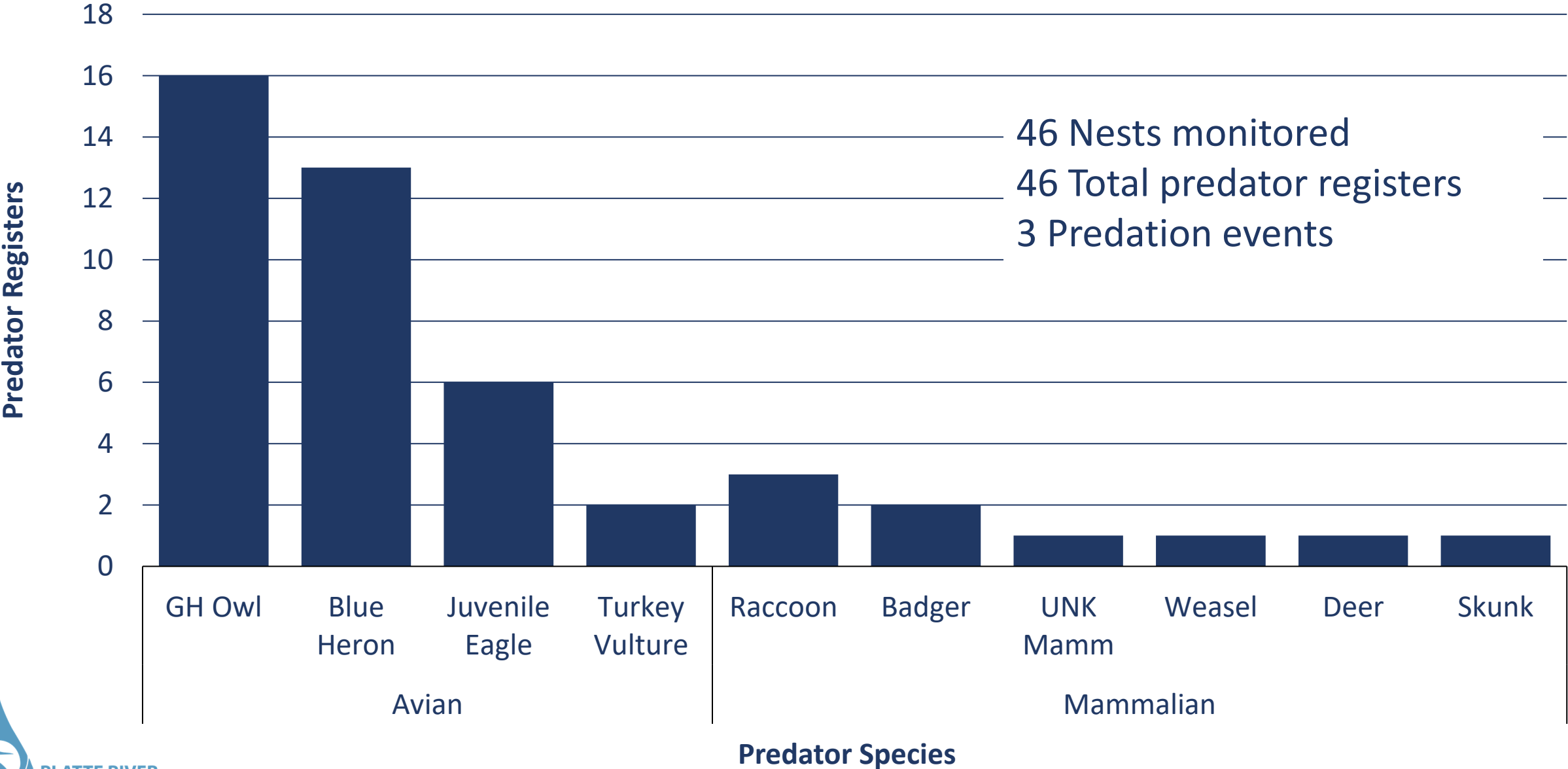
CORE CAM 86F 30C 05-19-2020 18:50:50



CORE CAM 79F 26C 06-28-2020 00:59:05



2020 Potential Nest Predator Registers



At These 5 Nesting Sites...

		Successful	Failed
Total Nests Monitored	78*	55 (71%)	23 (29%)
Total Nests with Cameras	46	36 (78%)	10 (22%)

*59% of the total nests monitored had nest cameras



Ⓜ CORE_CAM

70F 21C

06-20-2020 23:06:37



06-20-2020 23:06:40

Continuous Video Monitoring at Piping Plover Nests

Reviewing study design, setup, and data review

Pros of 24 – Hour Video Monitoring:

- Bullet cameras are more discrete
- Predation events
- Accurate nest fating
- Capture nest/brooding behavior
- Geese disturbance
- Weather events
- Possibly band combinations

Cons

- Data storage and review is extensive
- Supplies/setup are more intense than remote camera setups



Moving Forward

- 24-hour video monitoring of piping plover nests
- Measure responses of predators
- Measure responses of target species
- Video monitoring of mobile chicks??



Adaptive Management Working Group

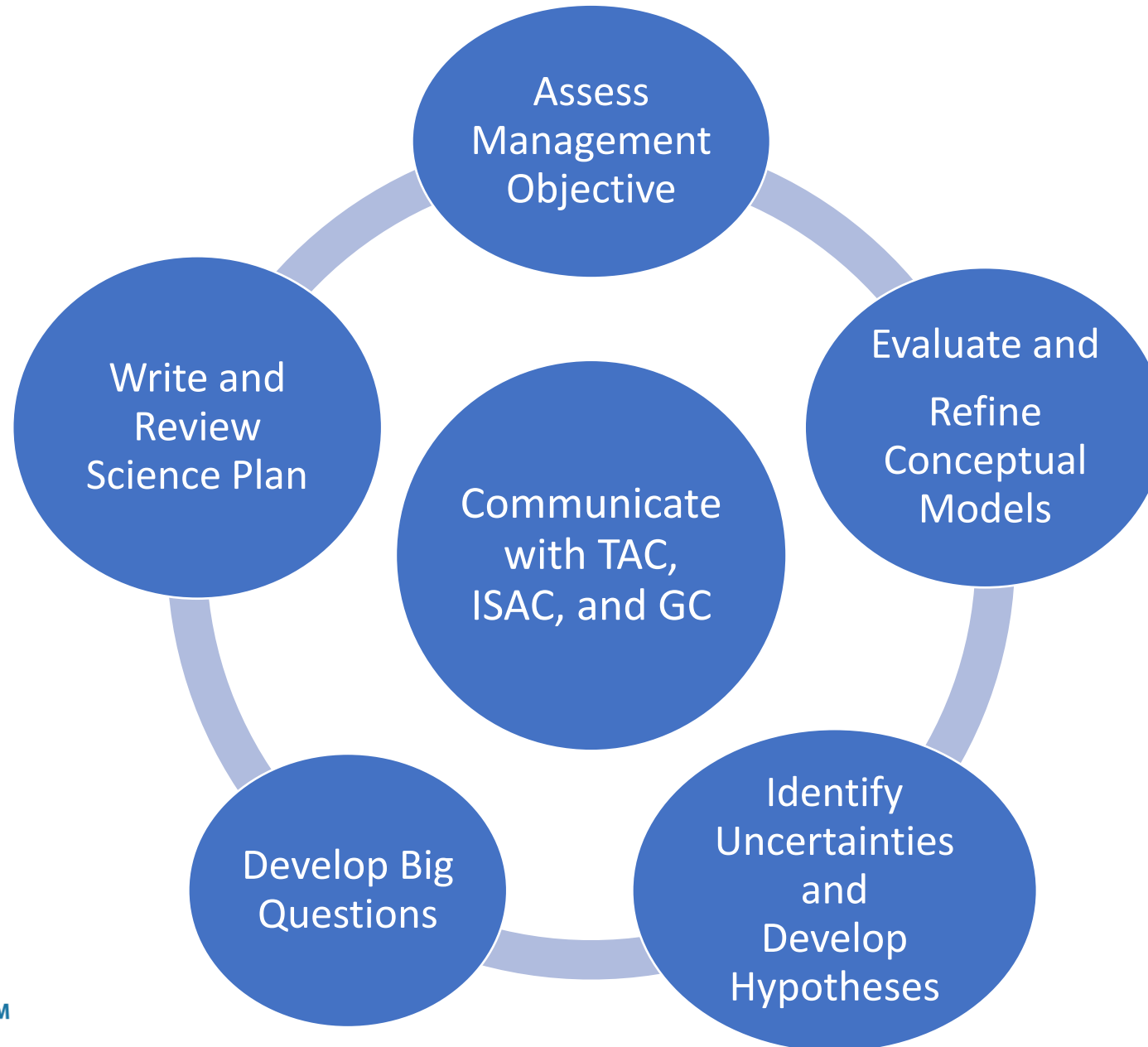
AMP Development

Least Terns and Piping Plovers

Malinda Henry – Science Lead
PRRIP EDO Staff

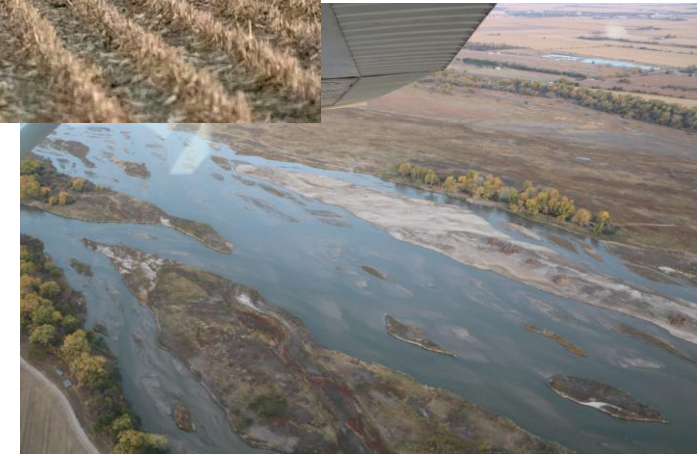


Adaptive Management Working Group

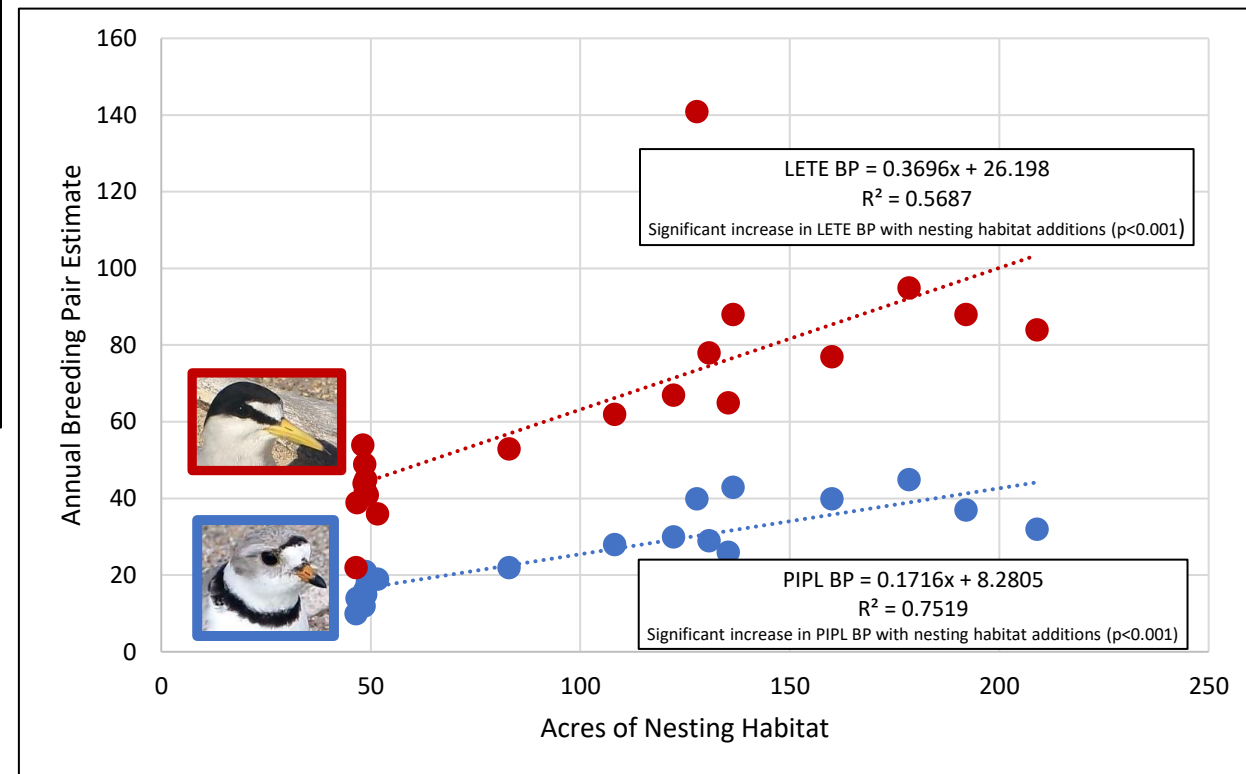
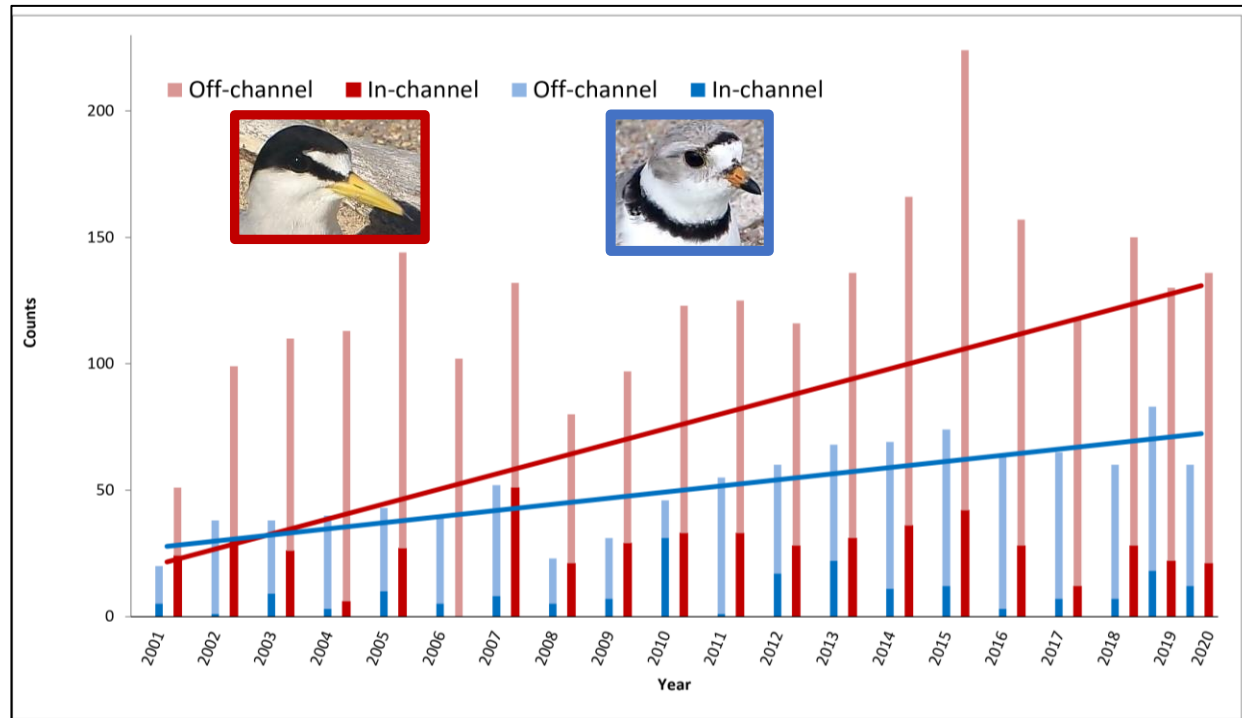


AMWG Members

- Interior least tern and piping plover expertise
 - Jeff Runge – USFWS
 - Jim Jenniges – NPPD
 - Dave Zorn – CNPPID
- Whooping crane expertise
 - Andy Caven – Crane Trust
 - Matt Rabbe – USFWS
- Hydrology/Hydraulics expertise
 - Tom Econopouly – USFWS
 - Mike Drain – CNPPID
 - Brandi Flyr – CPNRD
- Technically oriented policymakers
 - Brock Merrill – USBR
 - Jojo La – Colorado

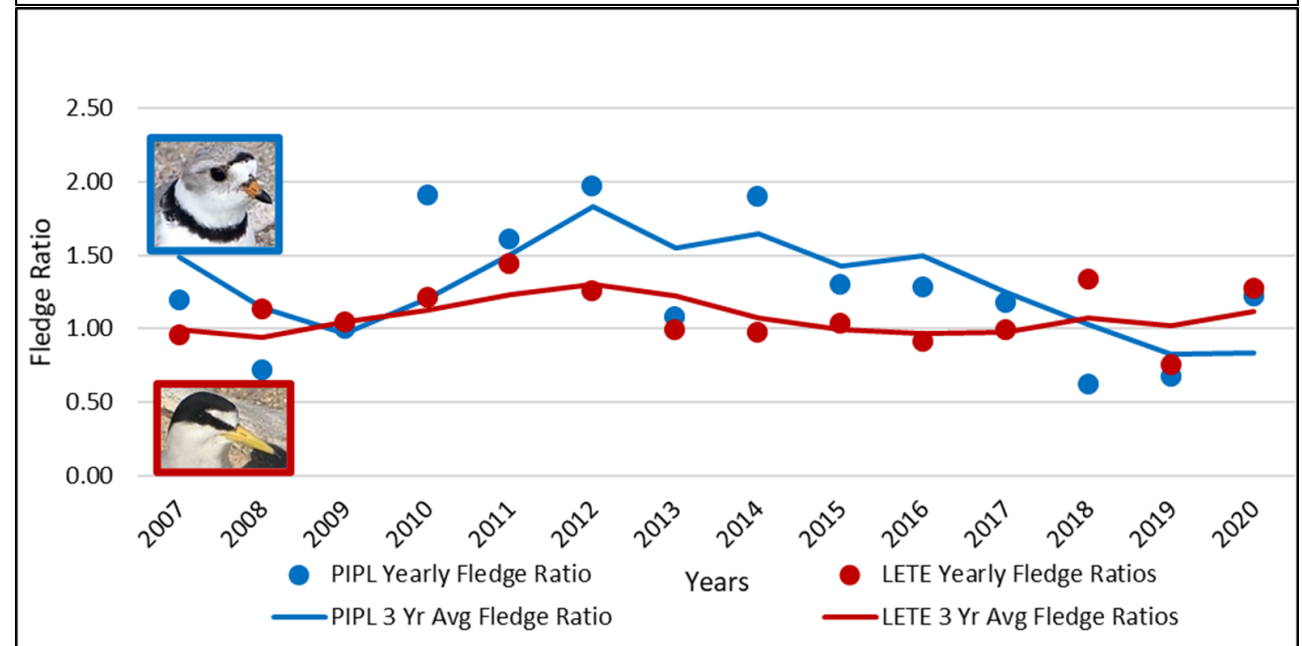
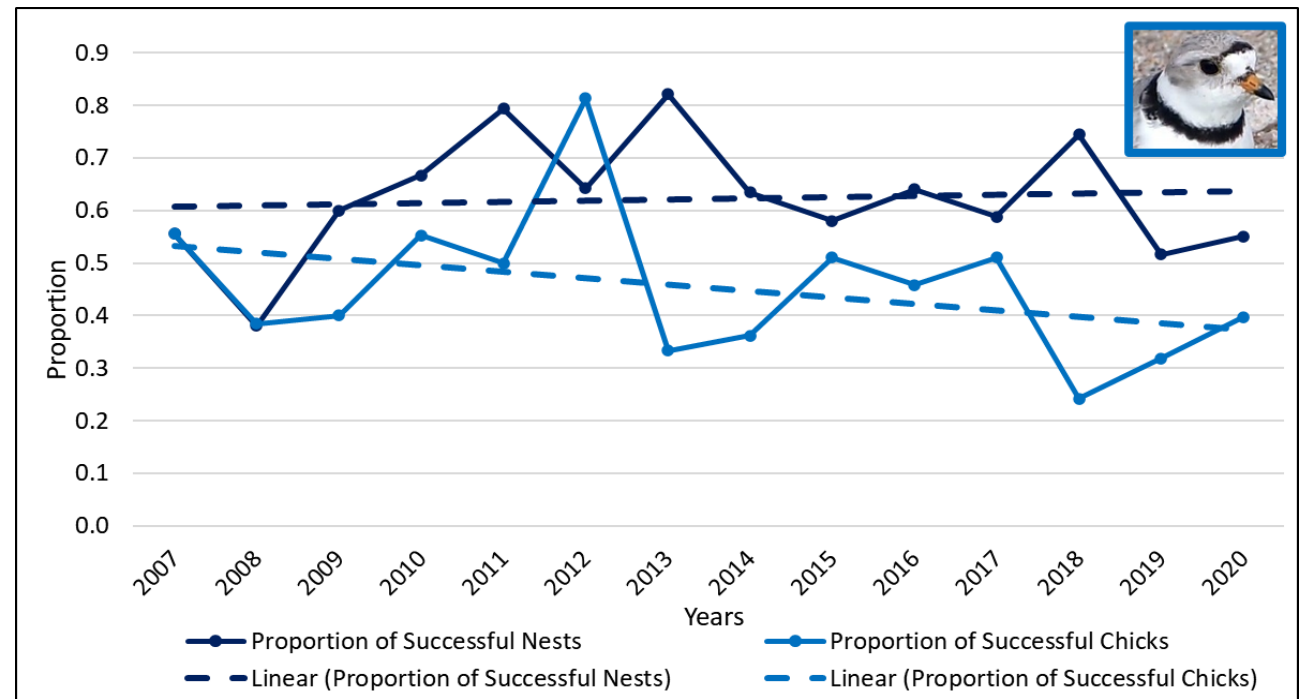


Improve production of Interior Least Tern★ and Piping Plover from the central Platte River

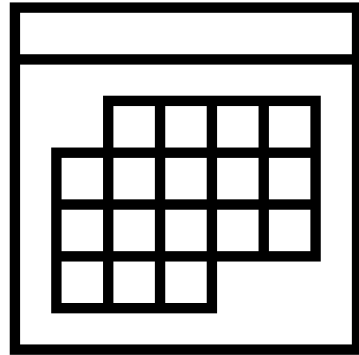
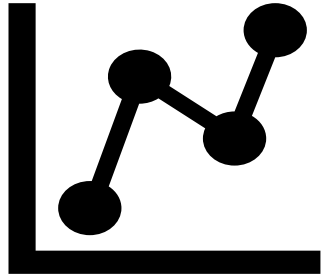


Performance Indicators

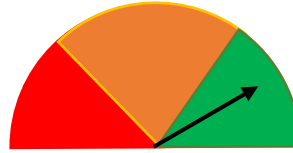
- Breeding pairs
- Eggs produced
- Egg survival
- Fledges
- Fledge ratio
- Adult survival



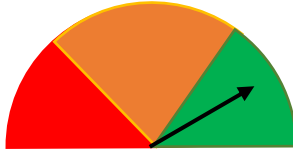
Performance Indicators



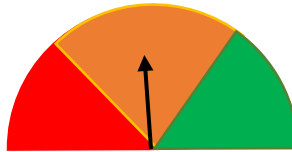
Variability over time



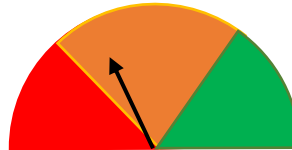
- Breeding pairs



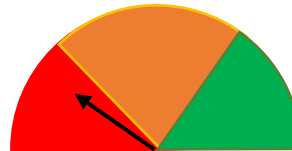
- Eggs produced



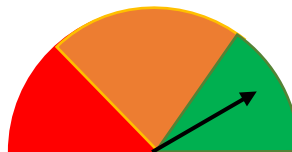
- Egg survival



- Fledges



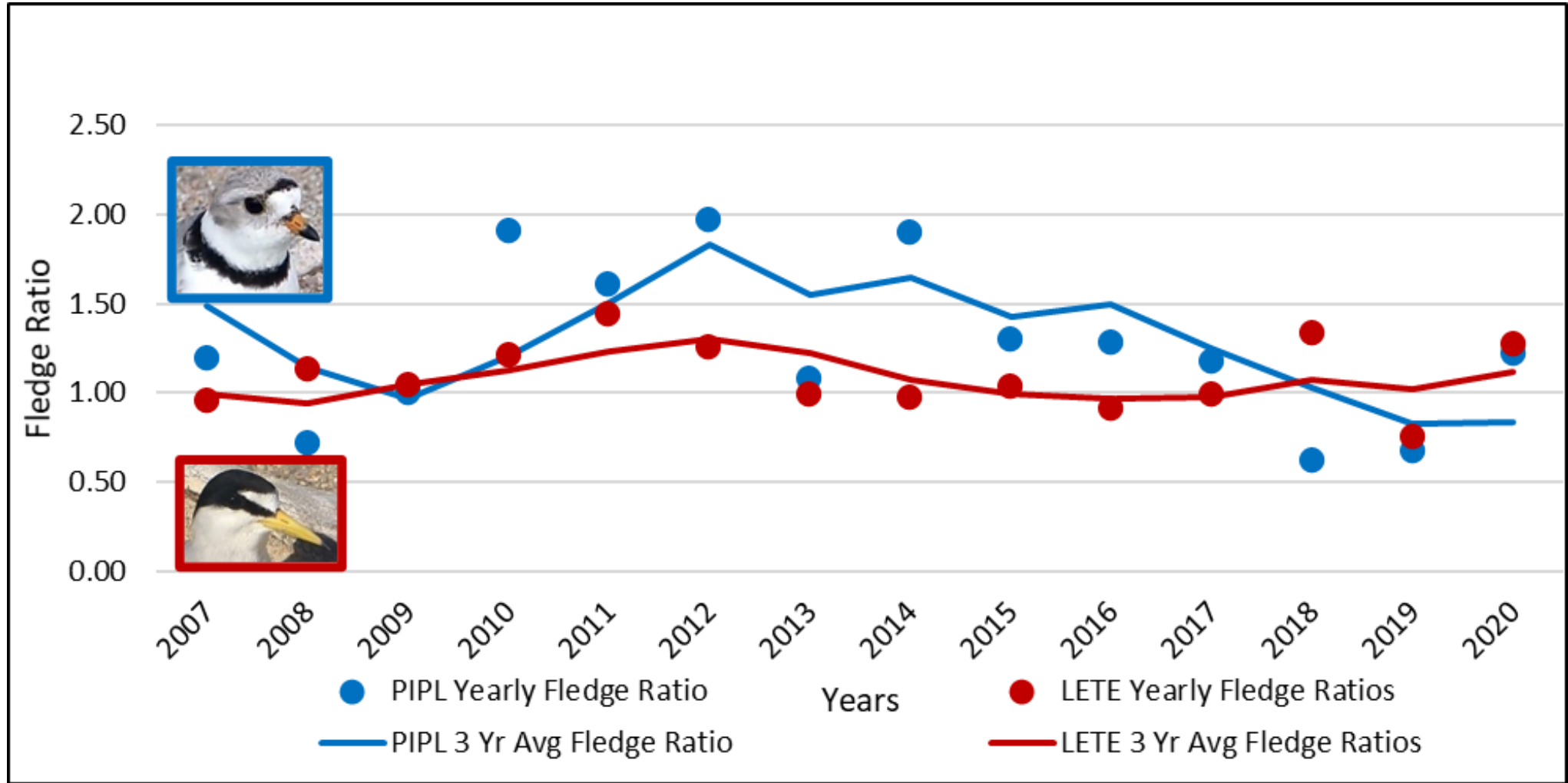
- Fledge ratio



- Adult survival

Management Action
recommended

Why did productivity decline from 2017 – 2019?



Failed Nests and Broods Terns and Plovers

Status	2017	2018	2019	2020
Predated	2	20	23	18
Weather/Flooding	11	4	18	0
Failed Unknown	93	58	87	58
Abandoned	1	1	1	3
TOTAL	107	83	129	79



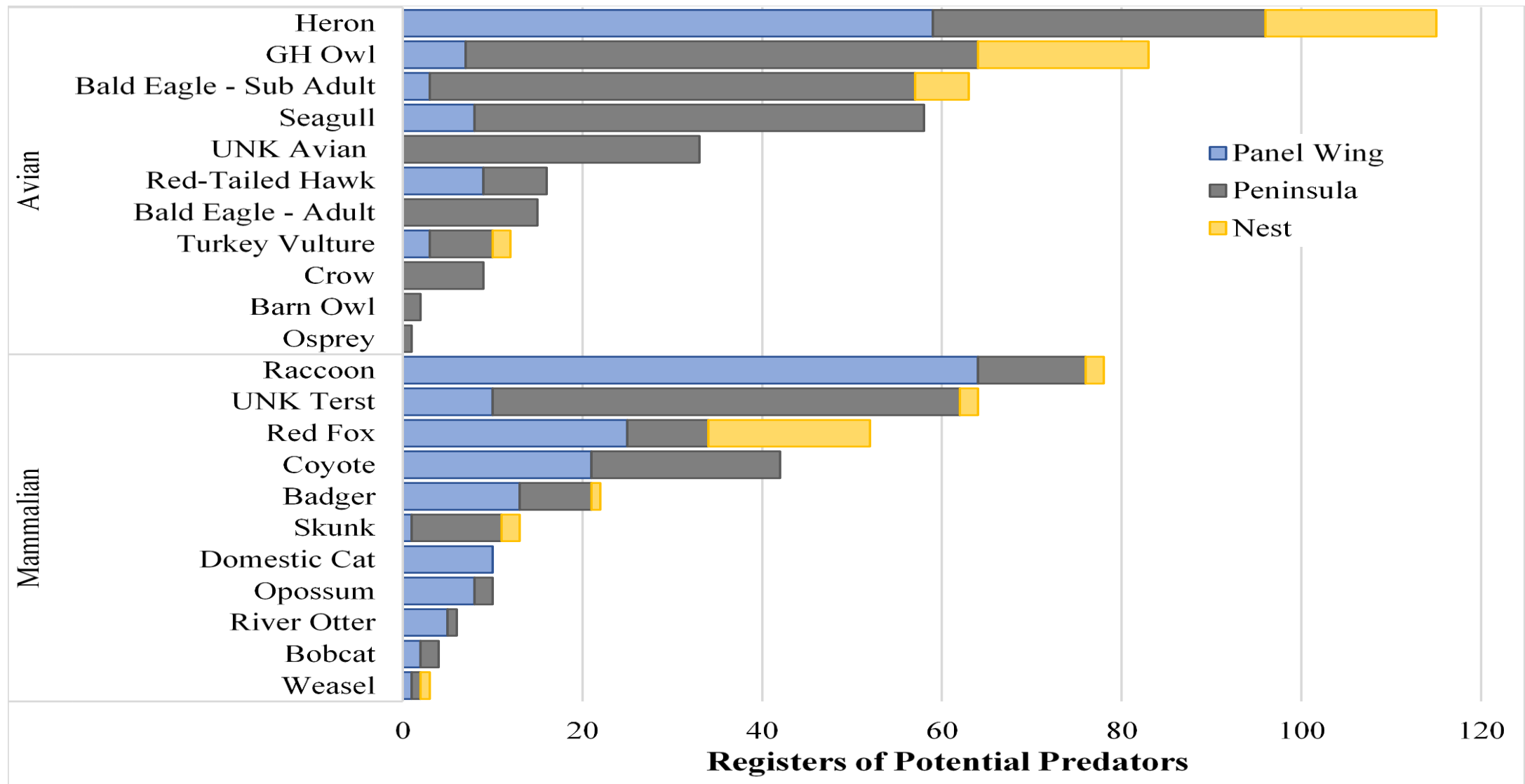


Figure 22. Total camera registers of potential predators at the panel wings (blue), on the nesting peninsulas (grey), and at tern and plover nests (yellow) at off-channel nesting sites; Blue Hole, Broadfoot South-Kearney, Dyer, Leaman East, Lexington, Newark East and Newark West, during 2017-2020.

Piping Plover CEM

High Control - High Uncertainty →

Low Control - High Uncertainty →

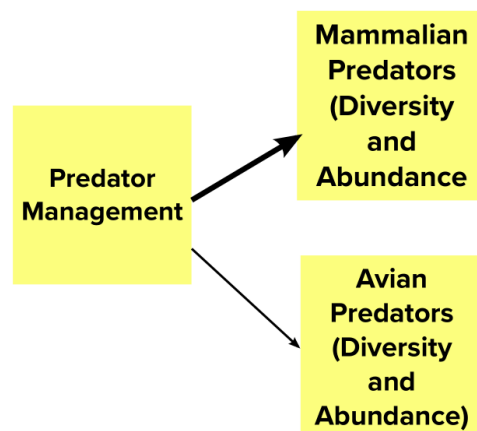
High Control - Low Uncertainty →

Low Control - Low Uncertainty →

Indirect Productivity Factors

PRRIP
Actions

Habitat



Direct Productivity Factors

Predation

Performance Indicators

Breeding
Pairs

Eggs
produced

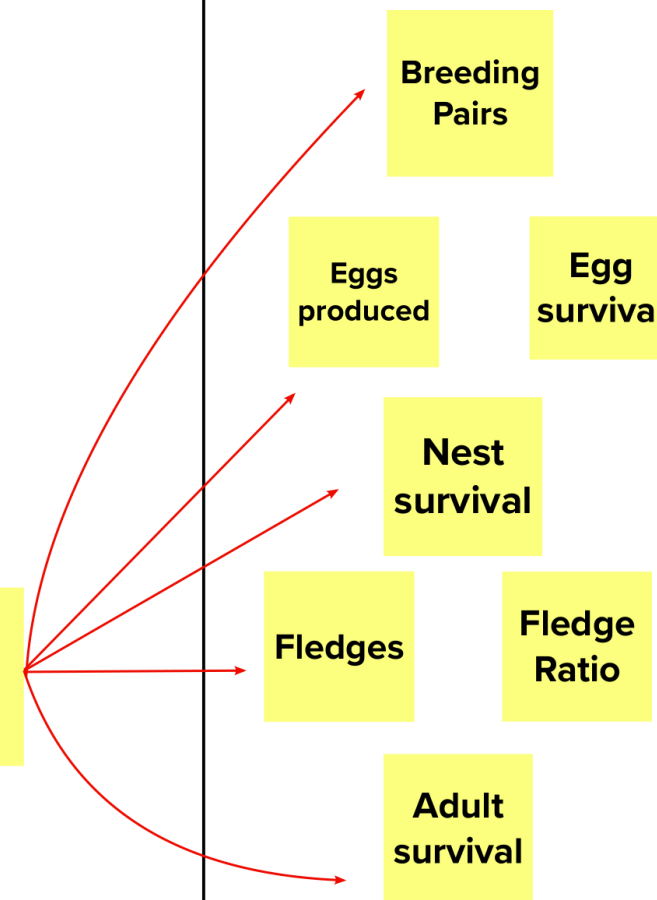
Egg
survival

Nest
survival

Fledges

Fledge
Ratio

Adult
survival



Piping Plover CEM

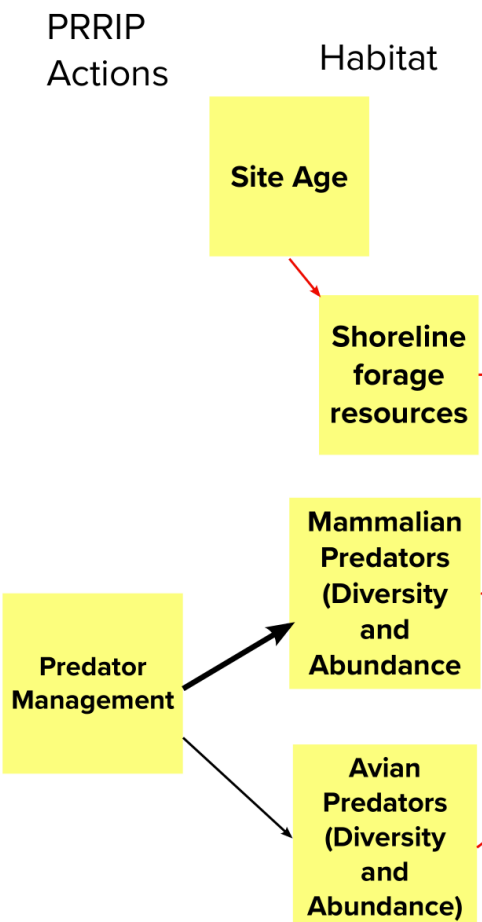
High Control - High Uncertainty →

Low Control - High Uncertainty →

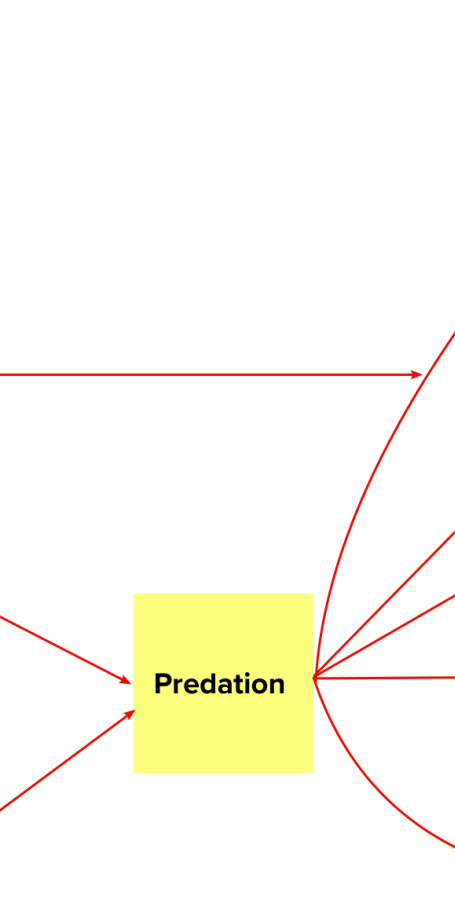
High Control - Low Uncertainty →

Low Control - Low Uncertainty →

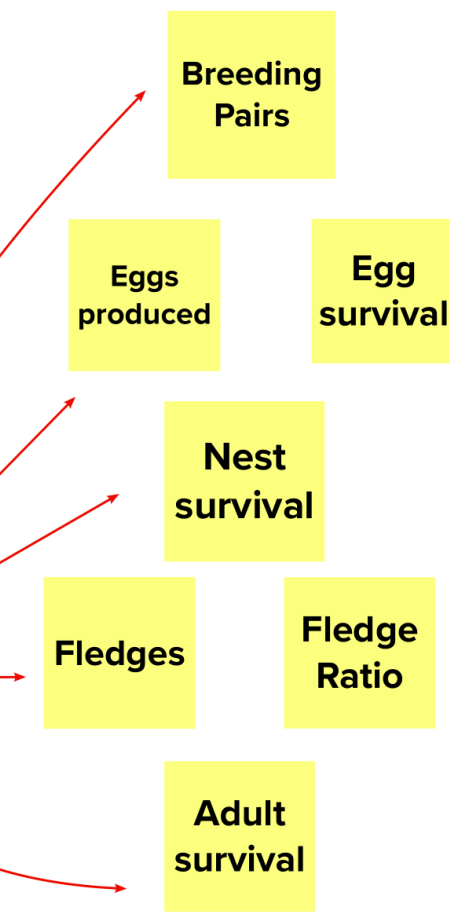
Indirect Productivity Factors



Direct Productivity Factors

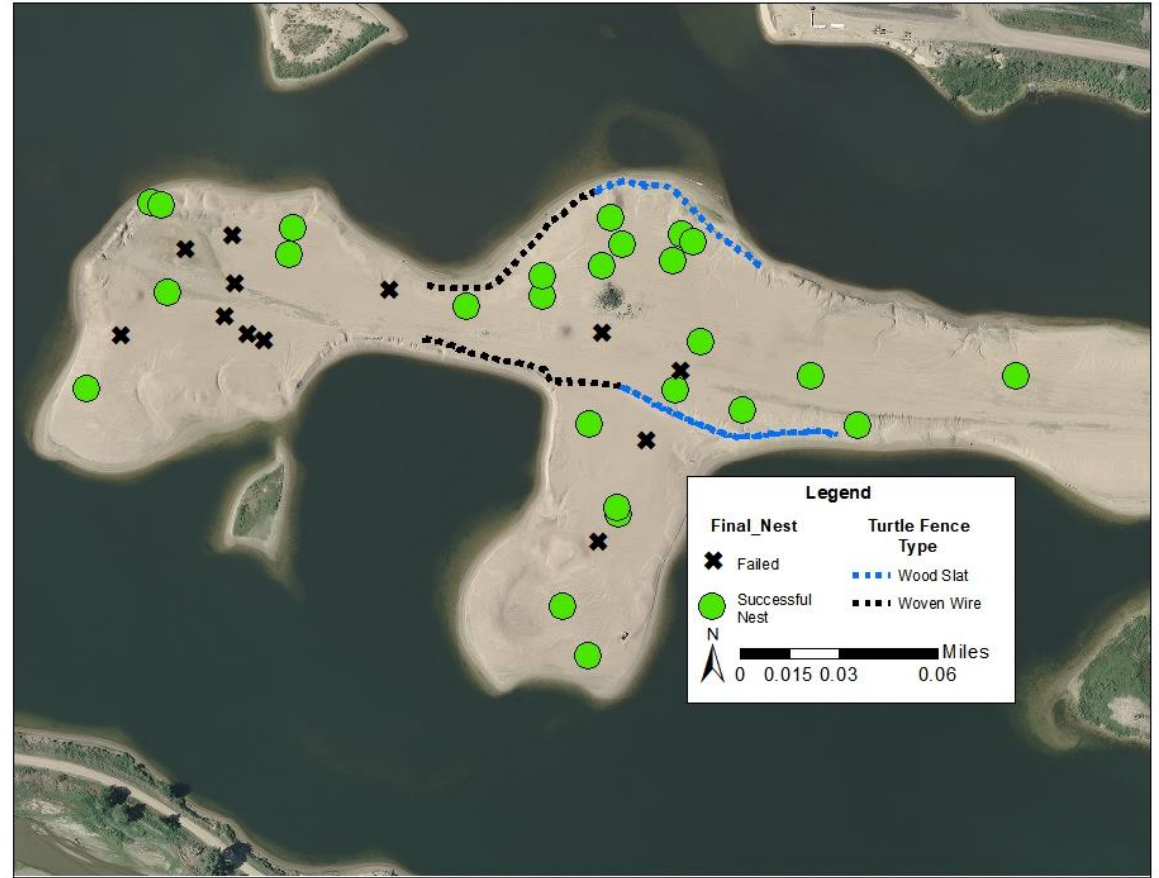
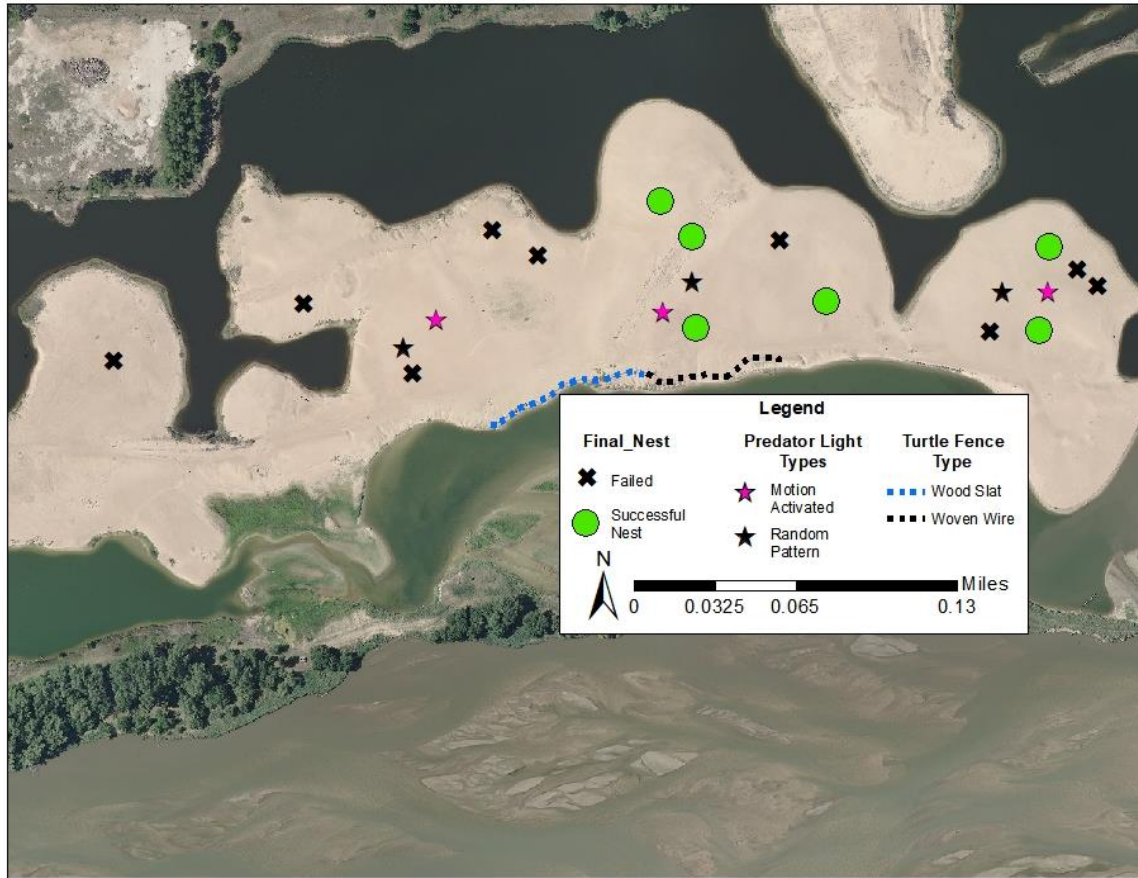


Performance Indicators



Additional Predator Control Pilot Study - 2020

Predator Deterrent Fencing and Lighting



Science Plan to Address Predation - 2021

Predator control/turtle fencing

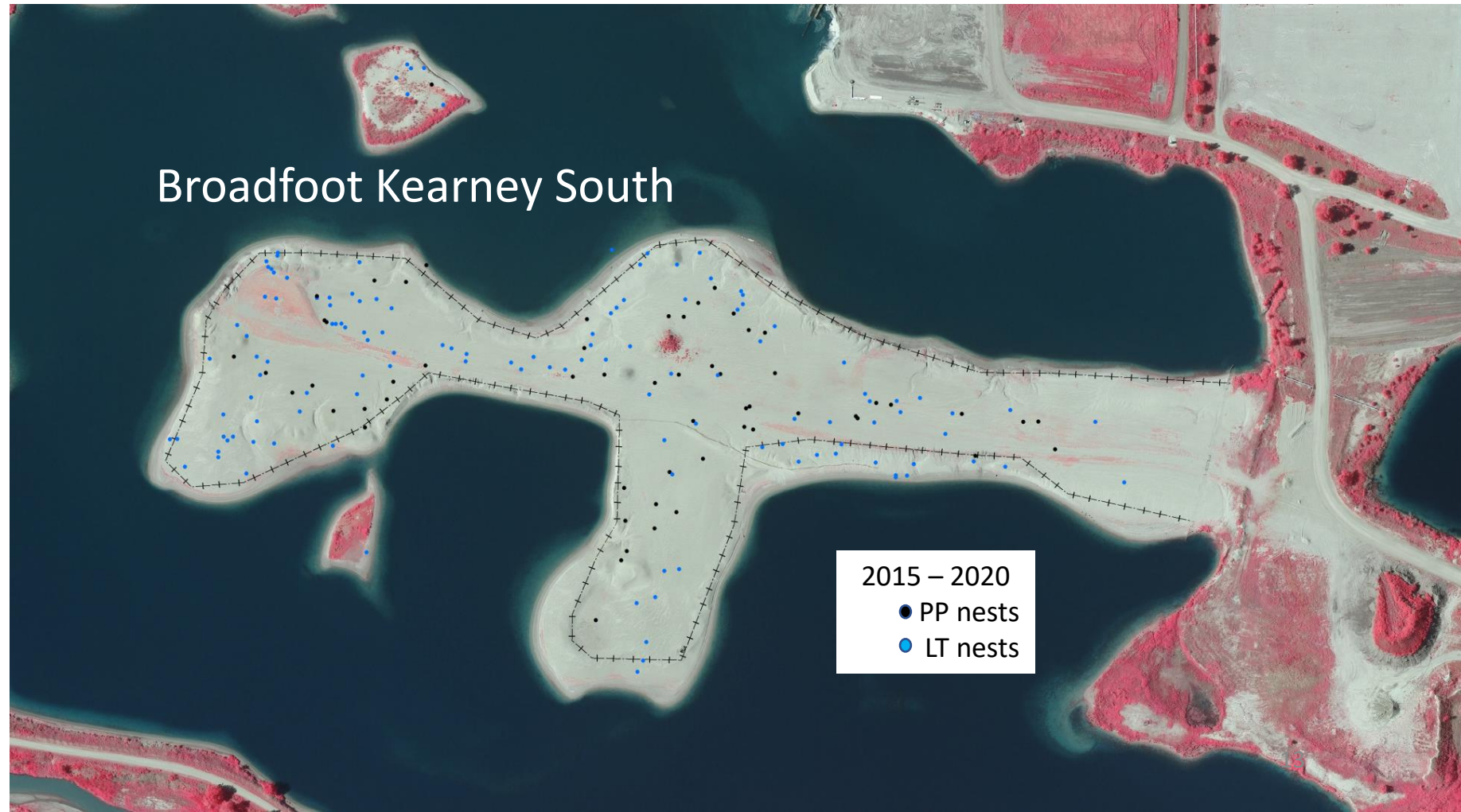
Predator deterrent lighting

Outside trapping

2002 – 2020

Plover Productivity

- 5.95 nests/year
- 4.11 breeding pairs/year
- 2.67 predated nests-broods/year
- 0.25 fledges/pair/year
- Mammal and avian predator presence

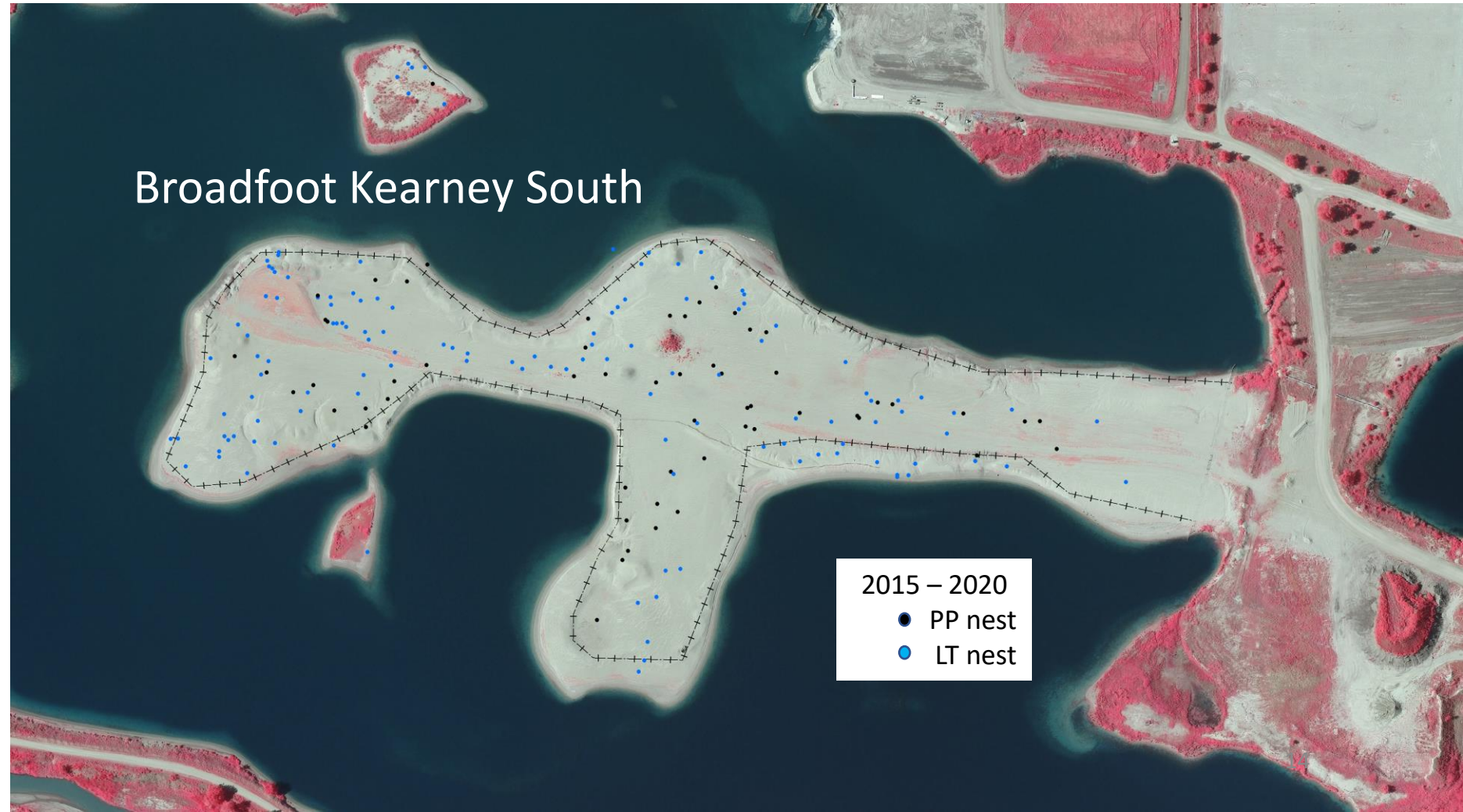


Science Plan to Address Predation - 2021

Monitoring effectiveness

Outside monitoring
Camera/video
monitoring

- Panel wing
- Shoreline
- Site-level
- Nest-level



Science Plan to Address Predation

MOVING FORWARD

- Additional sites
- Fixed 5-yr vs. annually rotating management plan
- High variability, few sites
- Camera vs. video
- Camera/video placement
- Avian predator control

