



# Agricultural netting: an uncontrolled killing of birds in the Central Plains of Thailand

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# “Pest bird” management

- Can be very challenging and costly to farmers (Anderson et al. 2013; Lindell 2020)
- In Thailand and SEA, various methods including **“nets”** are used across a wide variety of agricultural landscapes
- Netting impacts on bird mortality remain mostly unquantified, particularly in ricefields



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A large flock of small birds, likely sparrows or similar species, is captured in flight over a field. The birds are densely packed and appear to be moving in a coordinated fashion. The background is a soft-focus landscape with green grass and a clear sky.

# Objective

- To assess the scale of net-use and identify the bird species impacted by nets and other preventive measures



## Study area

# The central plains of Thailand

Covering an area of ~51,600 km<sup>2</sup> with a mean elevation of ~5 m asl in the lower part and slightly higher up to 100 m in the upper part of the plains

**Important Bird and Biodiversity Area**

 IBA

Bangkok



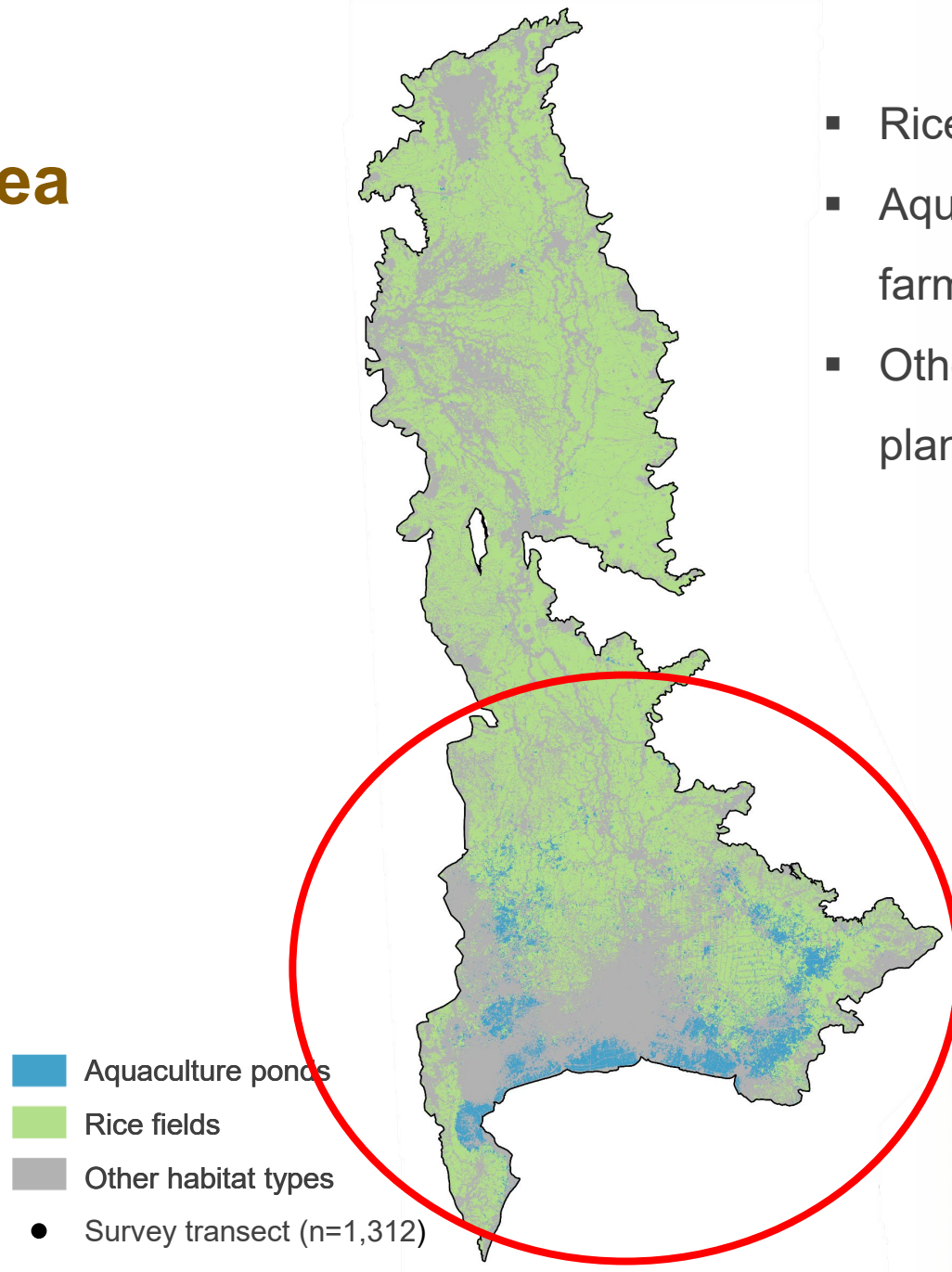




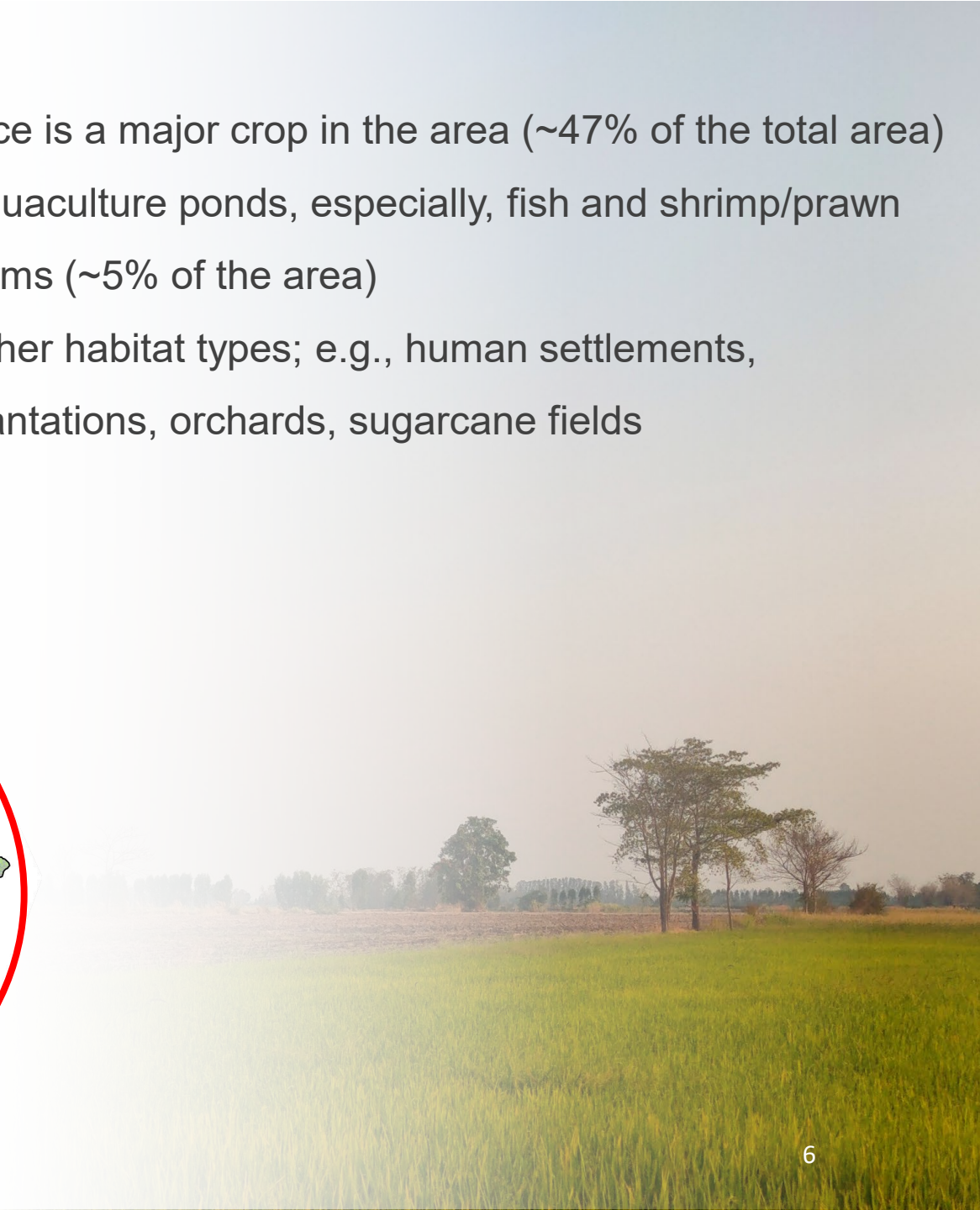
**The central plains of Thailand**



# Study area

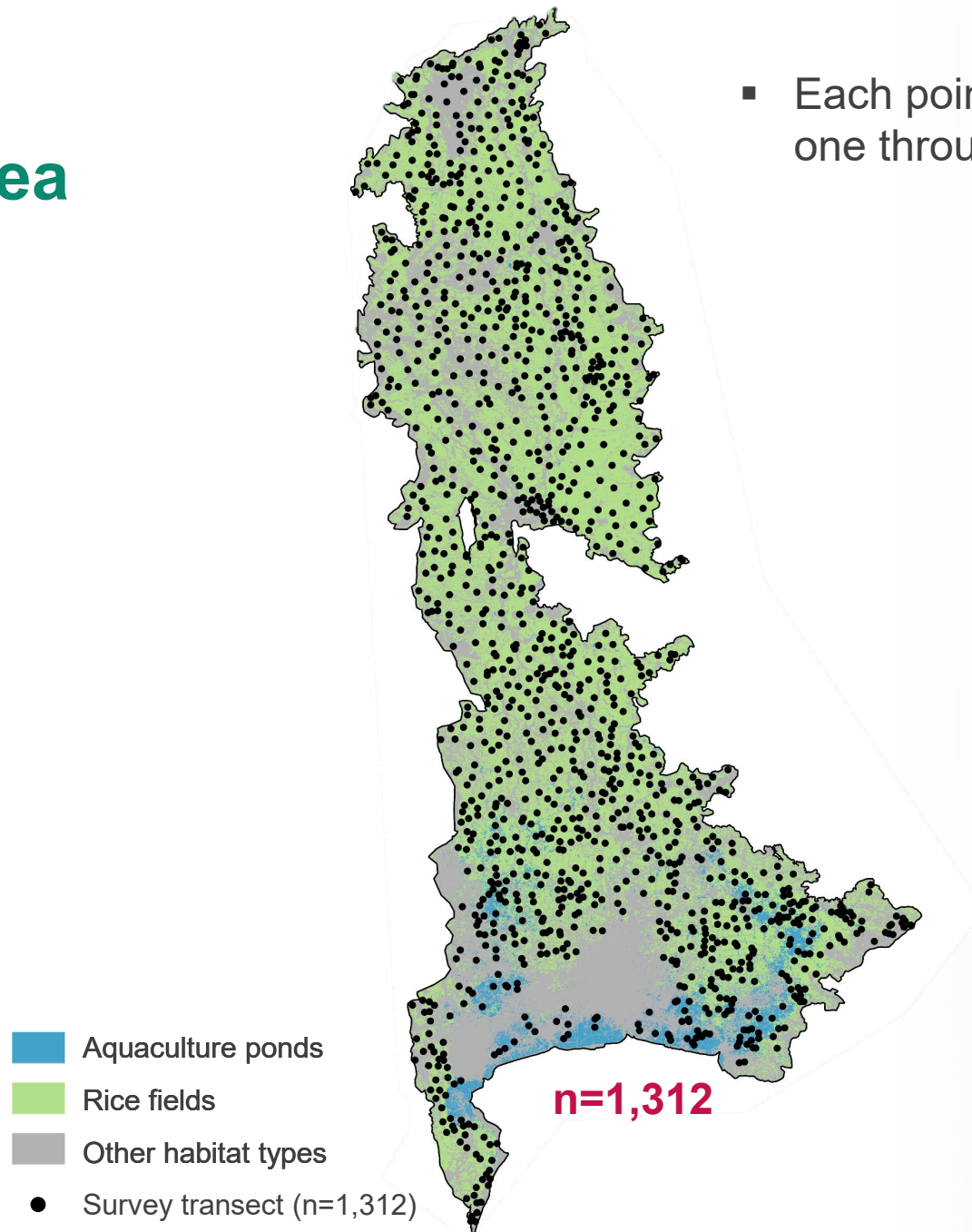


- Rice is a major crop in the area (~47% of the total area)
- Aquaculture ponds, especially, fish and shrimp/prawn farms (~5% of the area)
- Other habitat types; e.g., human settlements, plantations, orchards, sugarcane fields





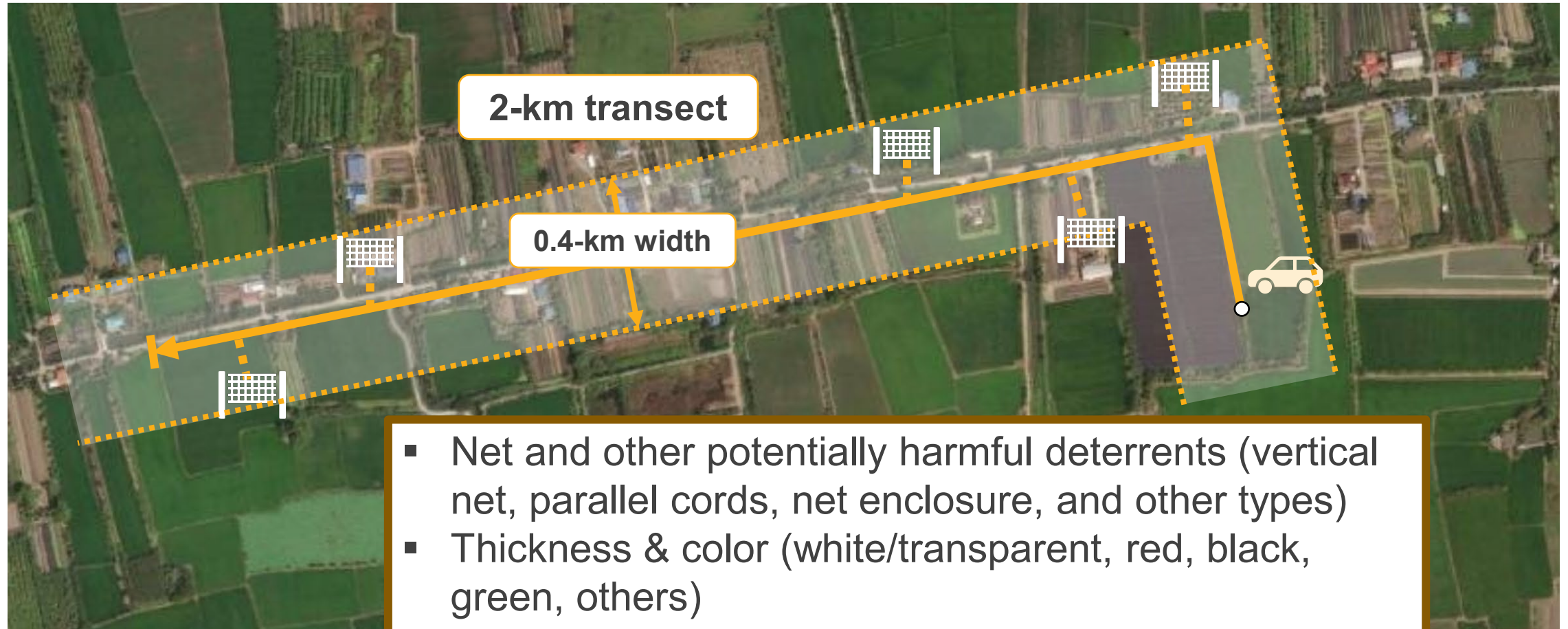
# Study area



- Each point is located at least **2-km apart** from the other one throughout the study area



# Net survey







**Vertical net**



**Parallel cords**



**Net enclosure**



**Others (e.g., hooks)**

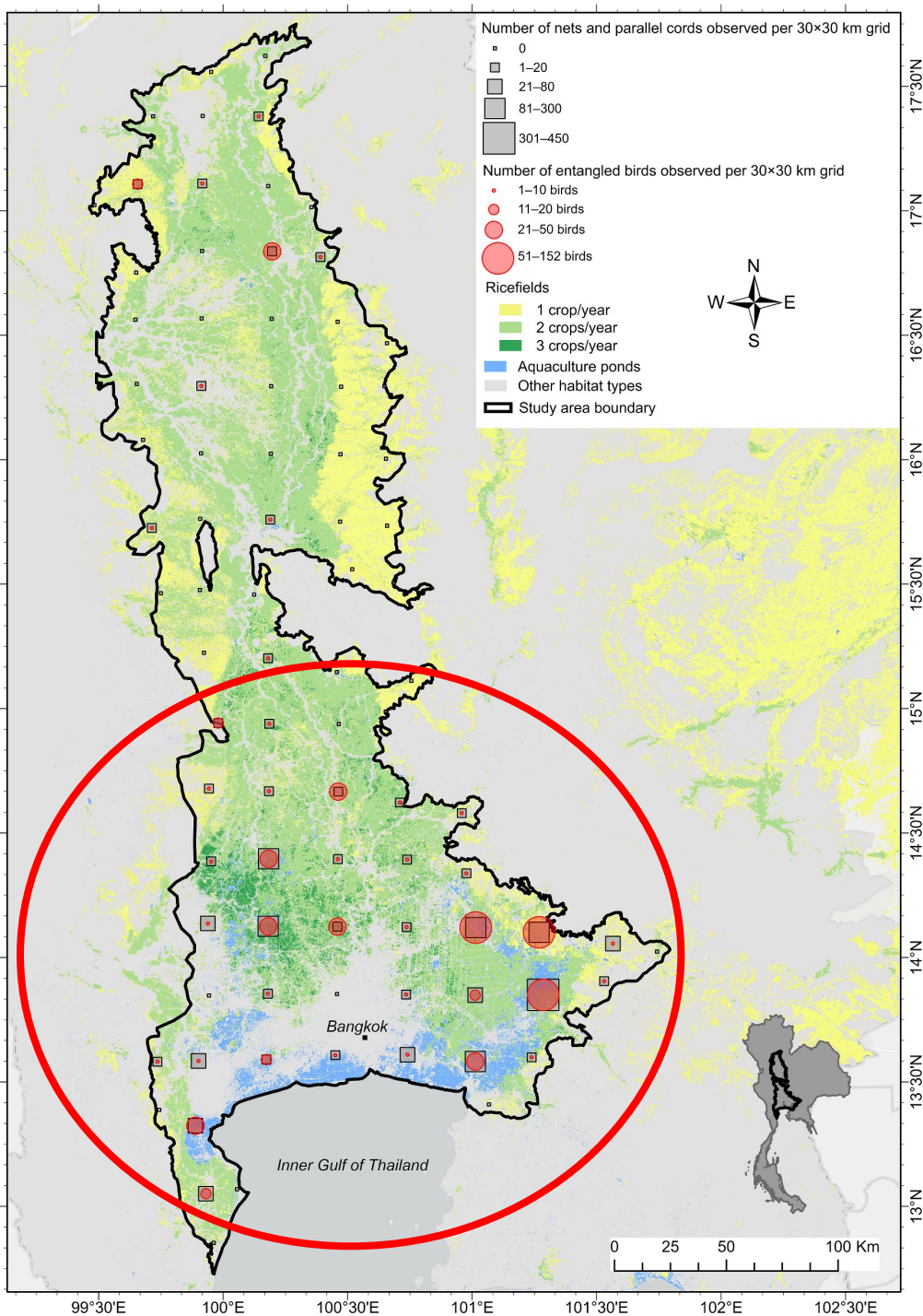




# Results



# Results

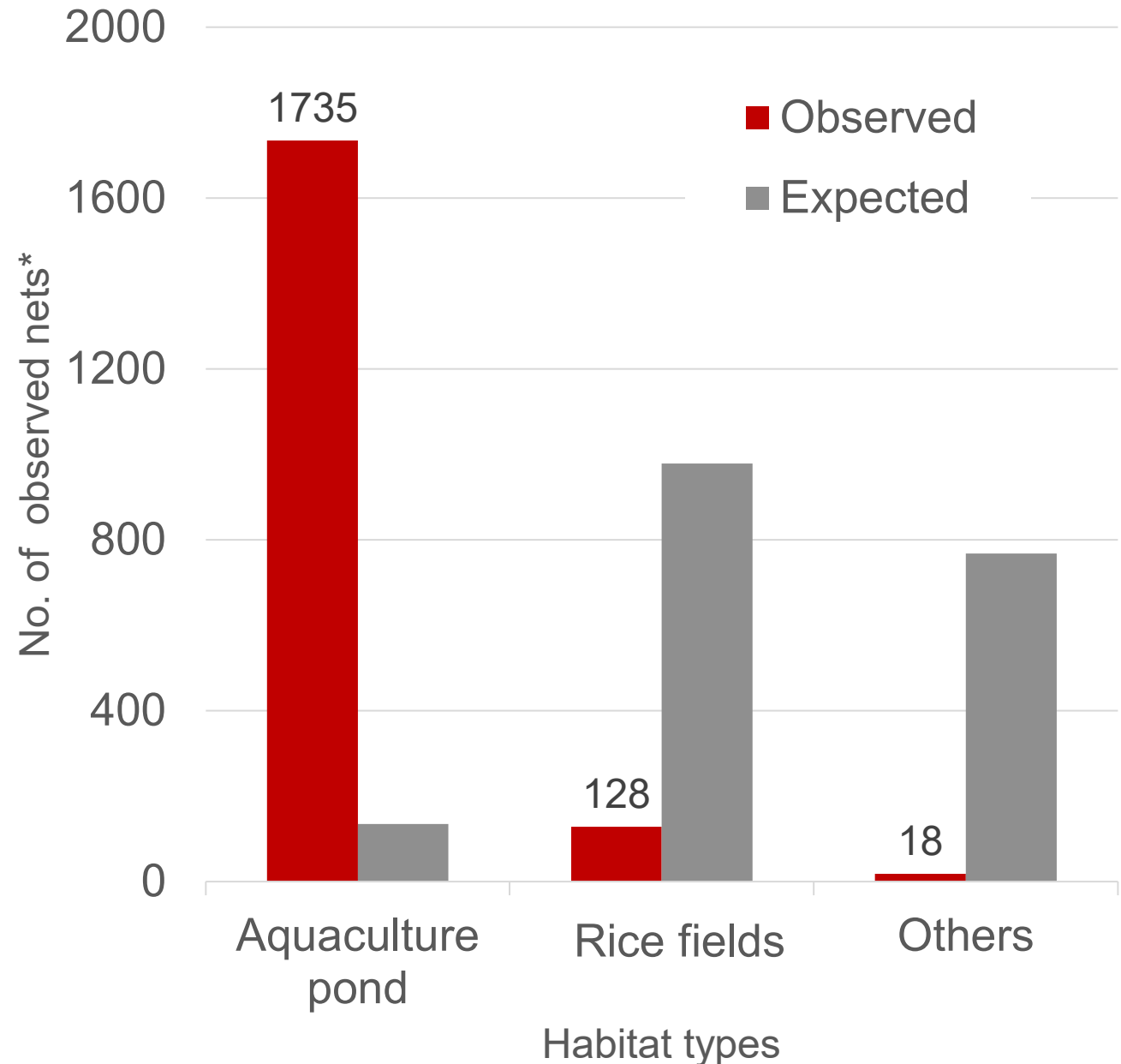


- We found 1,881 nets (including parallel cords) on 196 survey transects
- Nets were clustered in the lower part of the study area ( $z=16.456$ ,  $p<0.001$ )

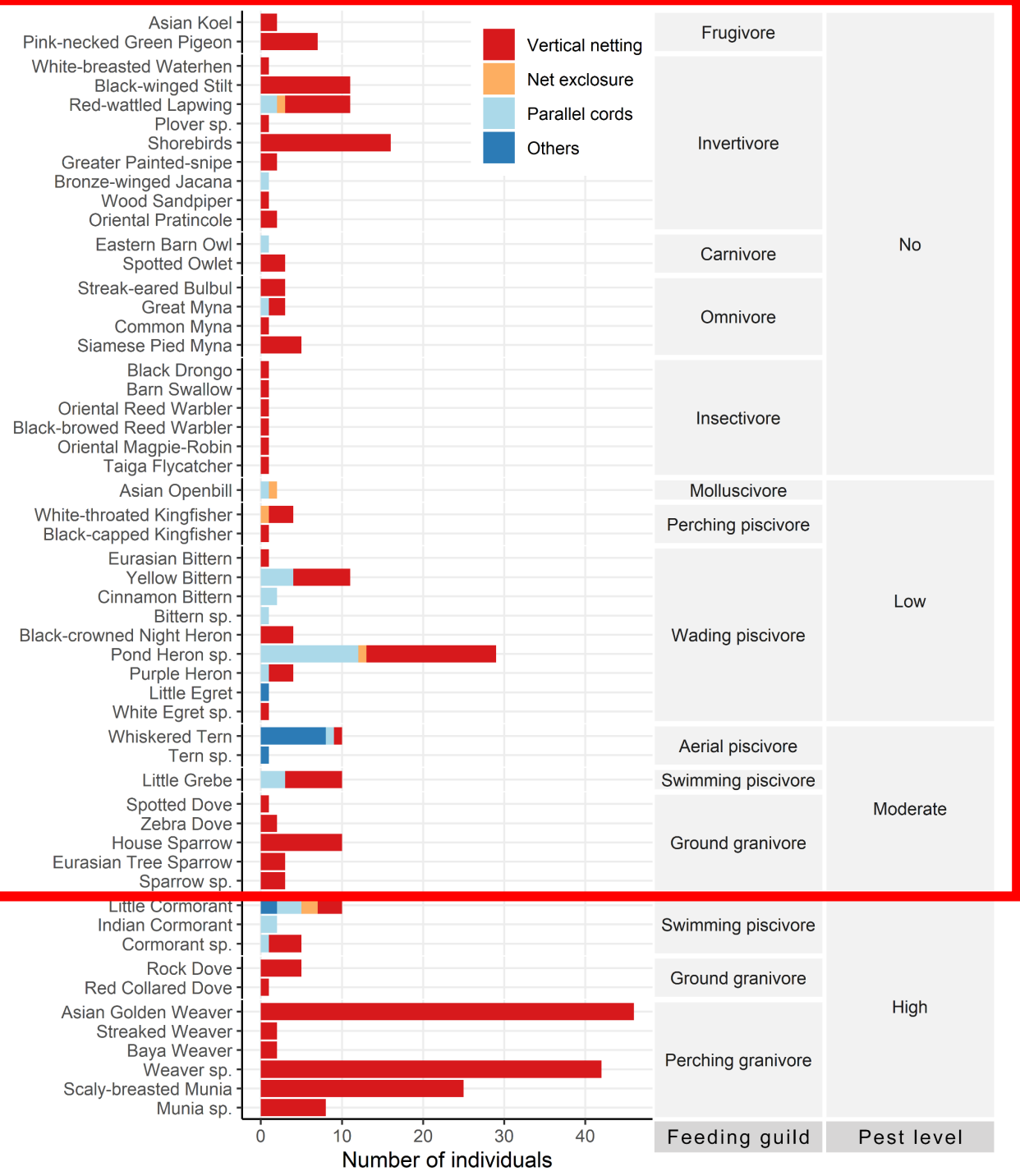


# Results

- The numbers of observed nets (including other deterrents) were **significantly different from the expected value** ( $G=8246.4$ ,  $df=2$ ,  $p<0.001$ ) based on habitat area.
- The observed number in **aquaculture ponds were ~13 times higher** than the expected value.







735 individuals of at least 45 species were caught, >80% were not considered highly destructive by farmers



Rice farmers

Weavers (*Ploceus* spp.)

Aquaculture farmers



Cormorants (Phalacrocoracidae)





Spotted Owlet



Black Drongo



Wrinkle-lipped Bat



Asian Openbill



Lyle's Flying-fox



Black-browed Reed Warbler



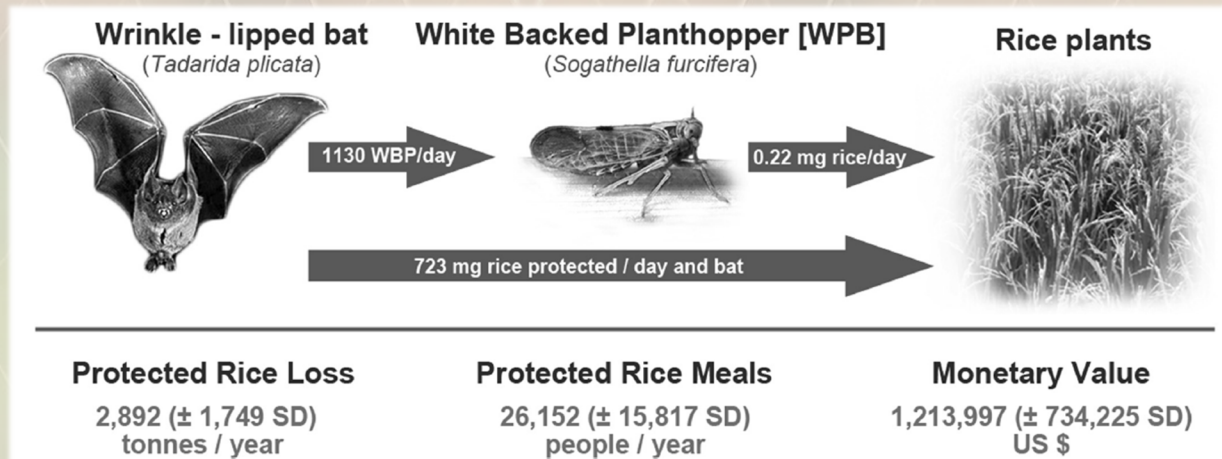
Black-capped Kingfisher

Yellow Bittern



# Ecosystem services

- **Wrinkle-lipped bat (*Mops plicatus*)**, which feeds primarily on a major rice pest White-backed planthopper (*Sogatella furcifera*) was also found dead in a vertical net
- According to Wanger et al. (2014), this particular bat species may prevent rice loss of almost 2,900 tons per year, which translates into a national economic value of more than 1.2 million USD.



(Wanger et al. 2014)



A large flock of small birds, possibly sparrows or finches, is captured in flight over a field of tall grass. The birds are scattered throughout the frame, with some in sharp focus and others blurred, suggesting movement. The background is a soft, out-of-focus landscape of green grass and a pale blue sky. The word "Conclusion" is overlaid in a large, white, sans-serif font across the center of the image.

# Conclusion



# Conclusion




- Netting is still being used indiscriminately in Thailand, despite the fact that it is not an effective method of pest control.
- This has resulted in the death of many birds, including those that are not considered pests and thought to play important roles in pest control.
- We suggest that a ban on netting should be imposed, and other mitigation strategies should be explored to reduce conflicts between humans and birds.
- Community participation should be prioritized in conservation actions, and future studies should investigate the efficacy of less deleterious deterrents.



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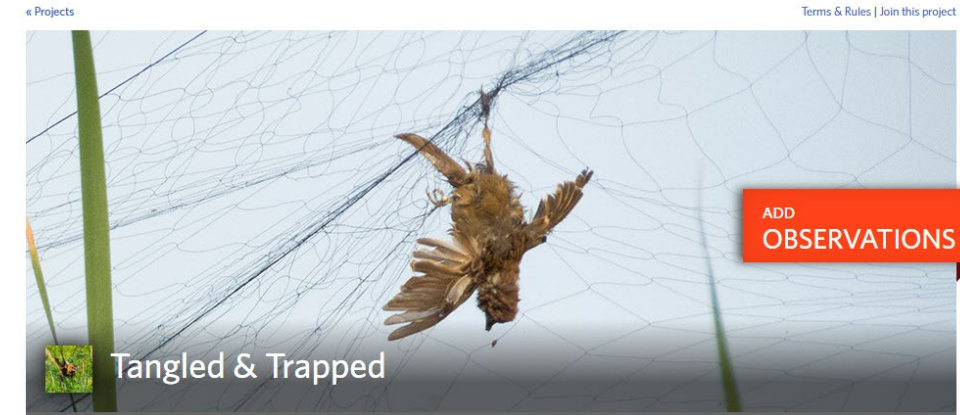
## Collateral damage from agricultural netting to open-country bird populations in Thailand

Rongrong Angkaew, Philip D. Round, Dusit Ngoprasert, Larkin A. Powell,  
Wich'yanan Limparungpatthanakij, George A. Gale 

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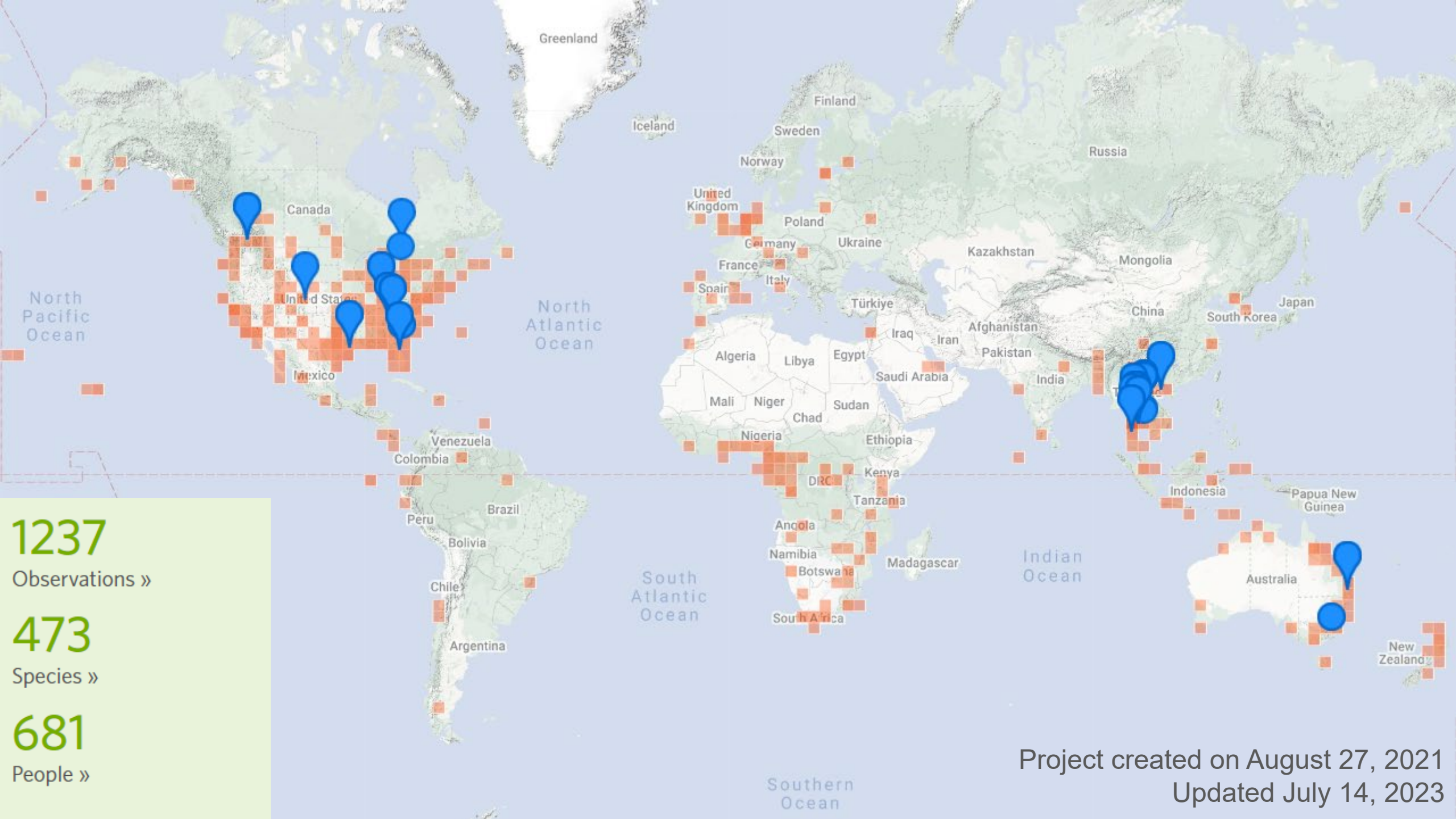


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**1237**  
Observations »

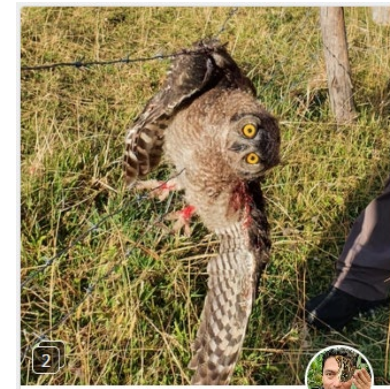
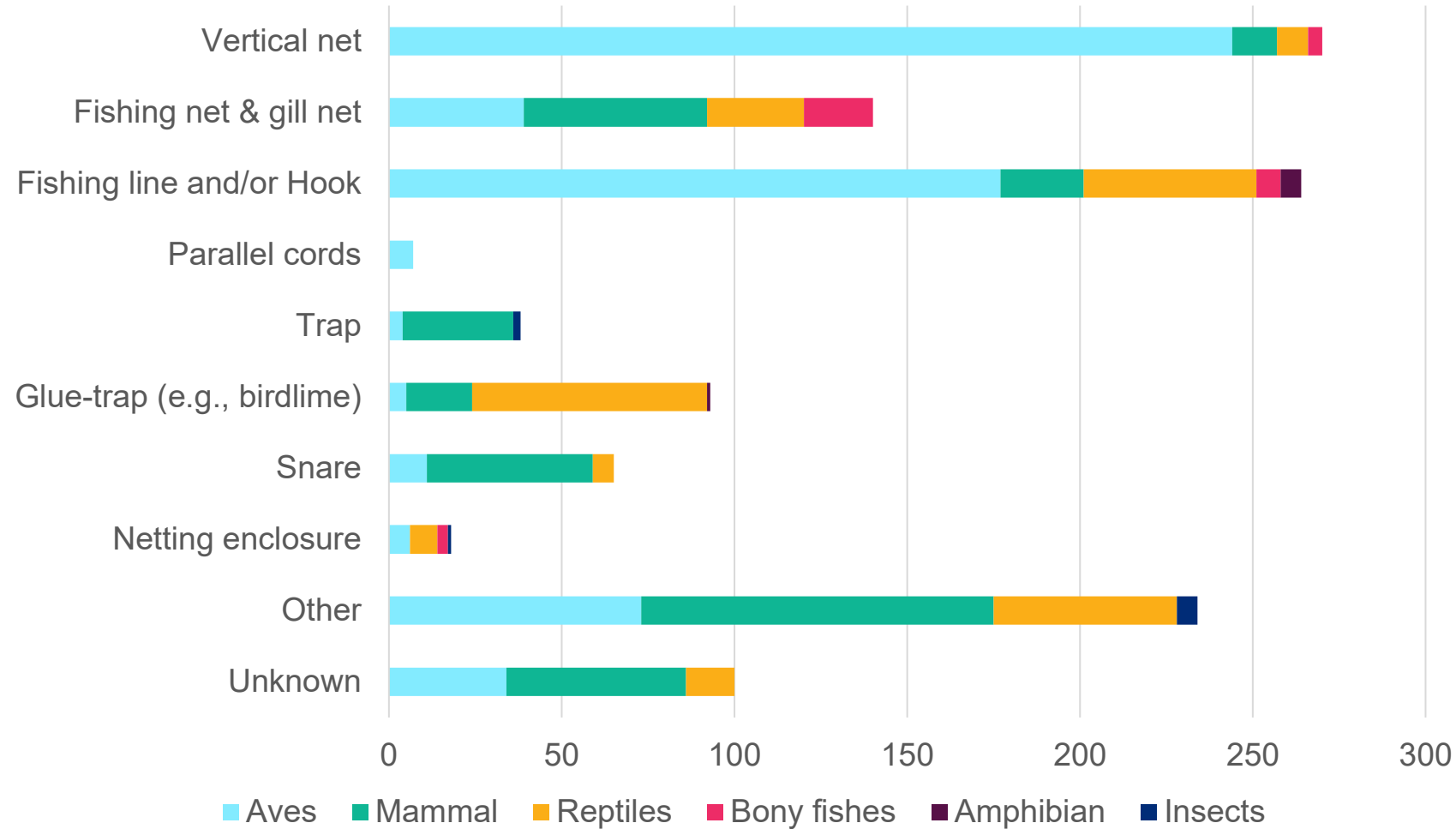
**473**  
Species »

**681**  
People »

Project created on August 27, 2021  
Updated July 14, 2023



# Equipment type



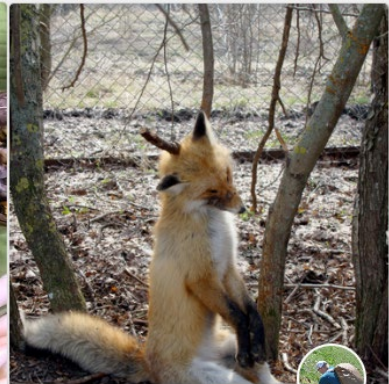
**Great Horned Owl**  
(*Bubo virginianus*)



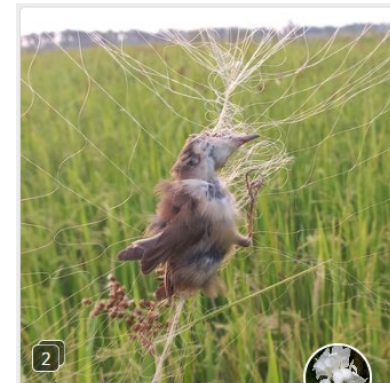
**Pond-Herons**  
(Genus *Ardeola*)



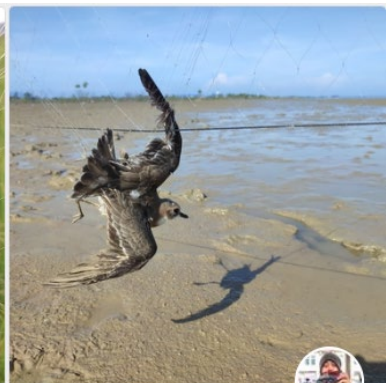
**Scarlet Minivet**  
(*Pericrocotus speciosus*)



**Red Fox**  
(*Vulpes vulpes*)



**Black-browed Reed War...**  
(*Acrocephalus bistrigiceps*)



**Lesser Sand-Plover**  
(*Charadrius mongolus*)





# Acknowledgement



**Larkin A. Powell**



**Philip D. Round**



**George A. Gale**

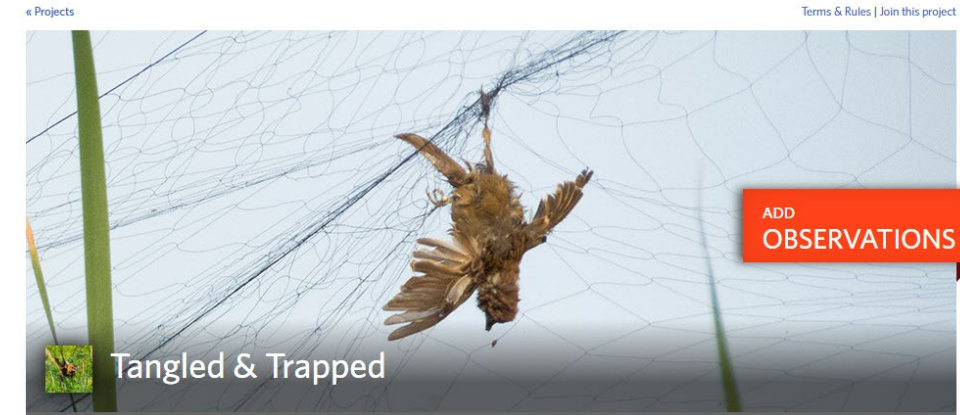


**Dusit Ngoprasert**



**Wichyanan  
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