Wading Birds and Their Prey: Hydrologic-Driven Responses on the Kissimmee River Floodplain

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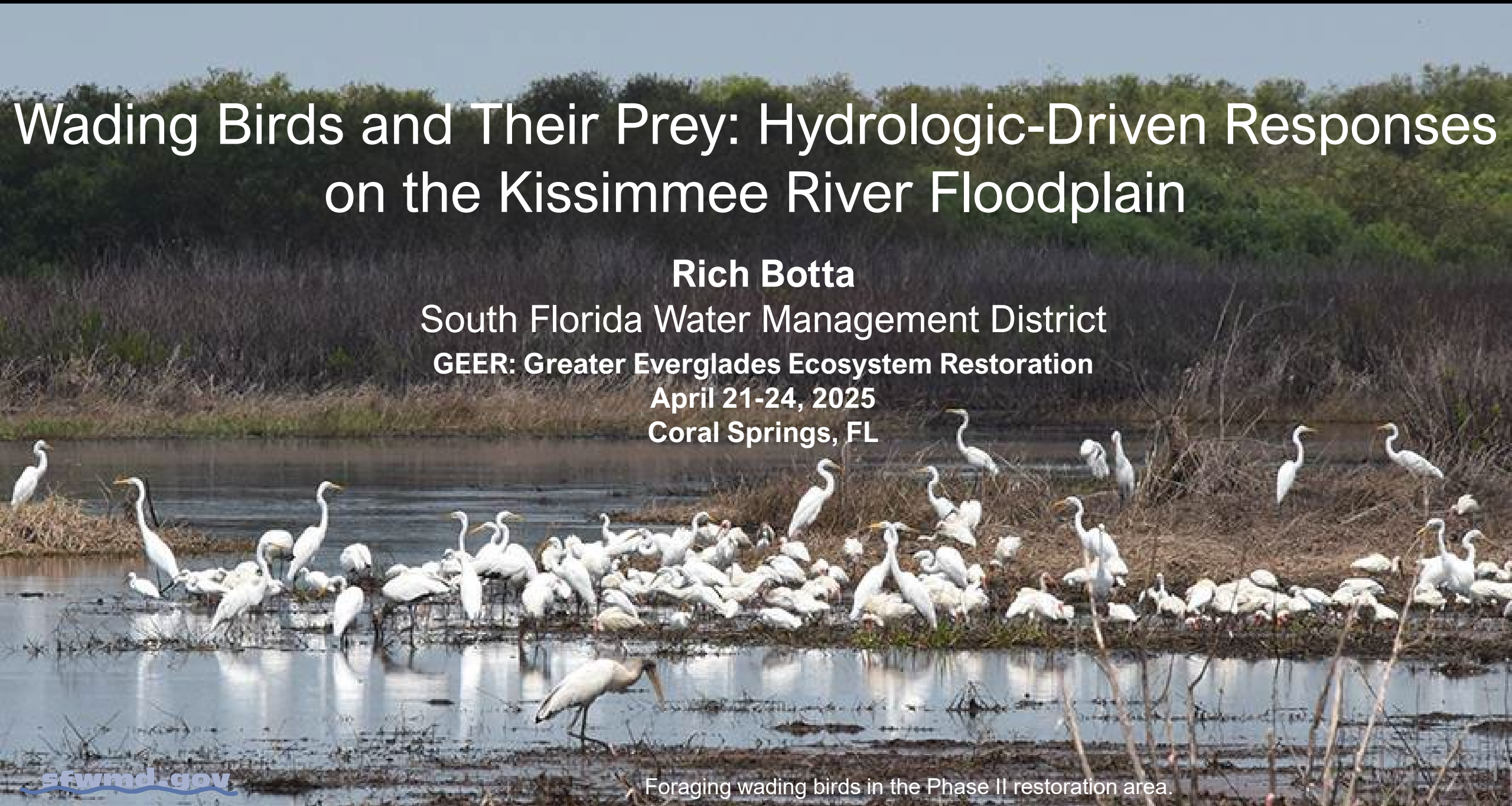
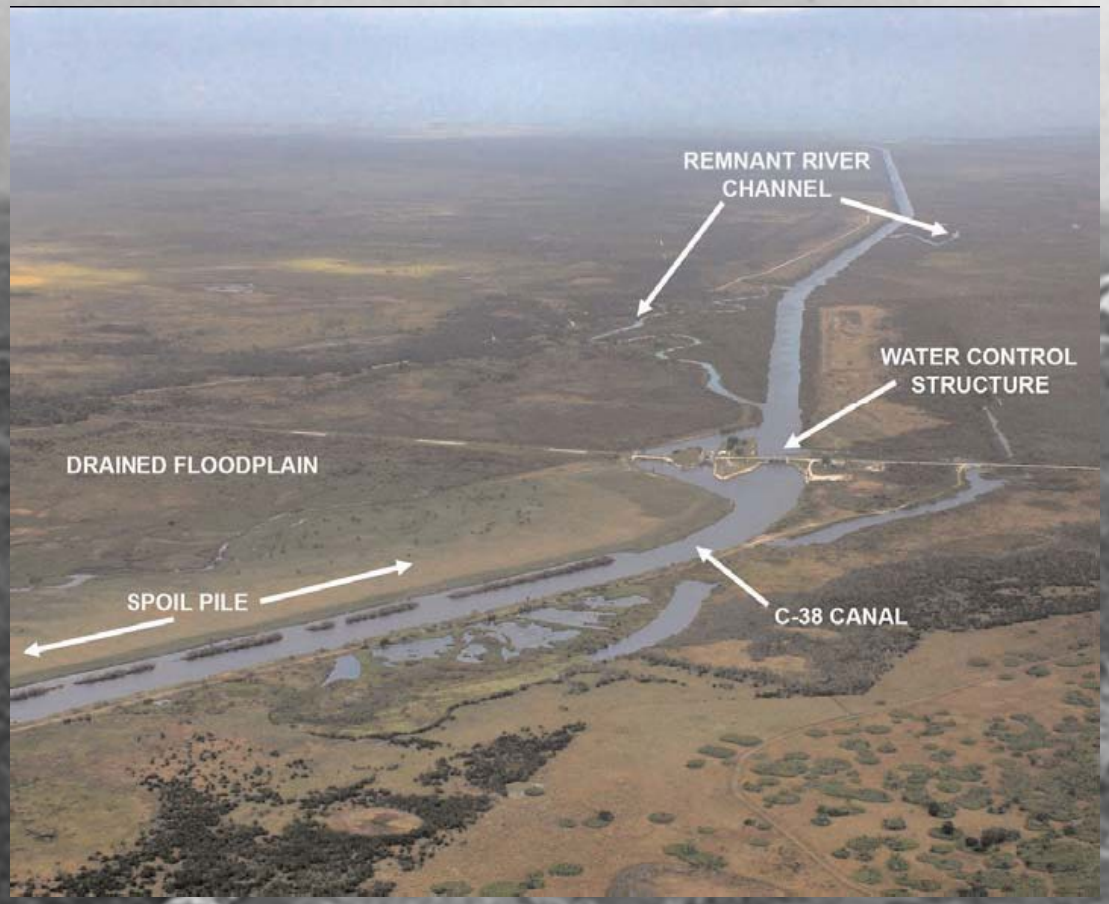
South Florida Water Management District

GEER: Greater Everglades Ecosystem Restoration
April 21-24, 2025
Coral Springs, FL



Foraging wading birds in the Phase II restoration area.

Channelization of the Kissimmee River (1962-1971)



1948 -Central and Southern Florida Project - USACOE
1954 -Congress authorized dredging of C-38 Canal - USACOE
1962-1971 -Kissimmee River Channelized (5 Pools, 6 structures)
26,000-31,000 acres of floodplain marsh lost

KISSIMMEE RIVER RESTORATION EVALUATION PROGRAM

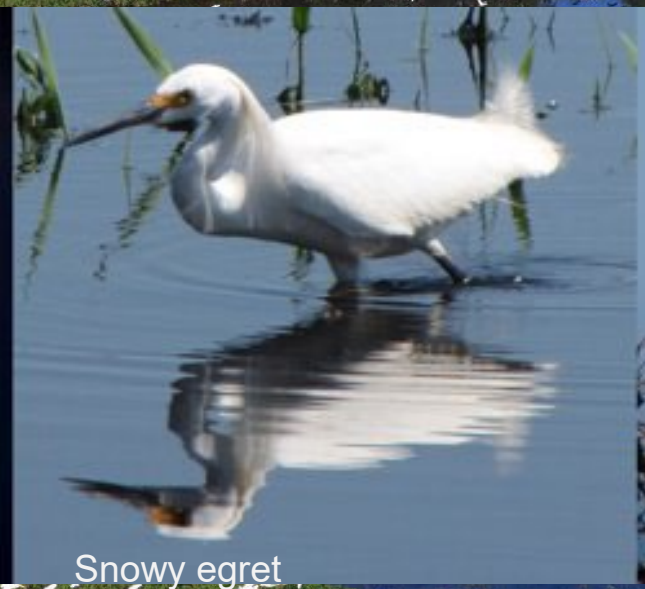
- **KRRP EXPECTATION 24**

[a] Mean annual dry season density of long-legged wading birds (excluding cattle egrets) on the restored floodplain will be ≥ 30.6 birds/square kilometer (km^2) (3-year running average)

[b] at least 85% of the monthly surveys will have ≥ 30.6 birds/km^2.

Why Wading Birds?


White ibis

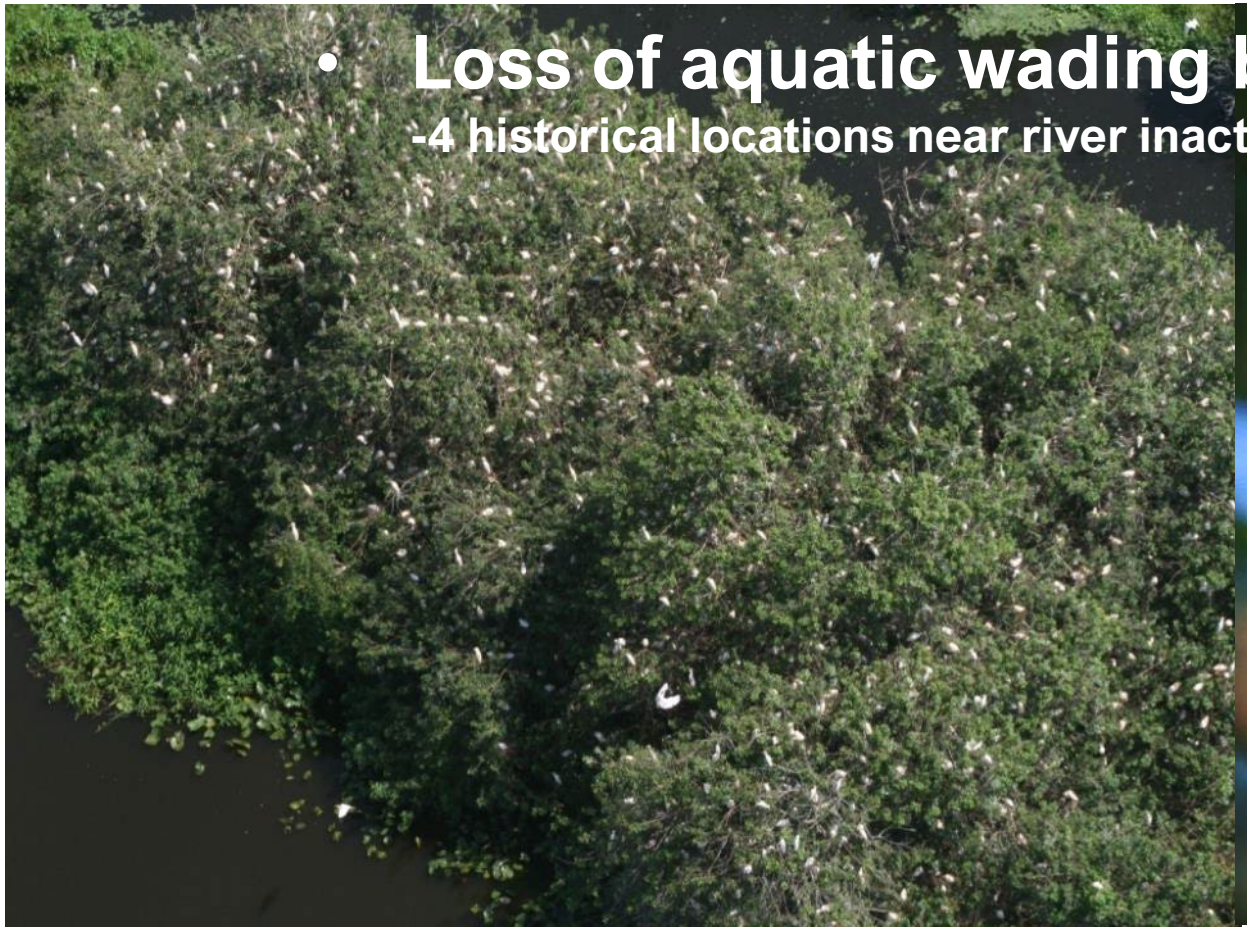

Snowy egret


Great egret

- Good indicator of quality wetland conditions are present
- Gregarious and forage in large flocks
- Highly visible and well represented during aerial surveys
- Top predators in wetland systems
- Opportunistic and highly mobile, can be fickle
- High interest to the public

Negative Effects Of Channelization On Wading Birds

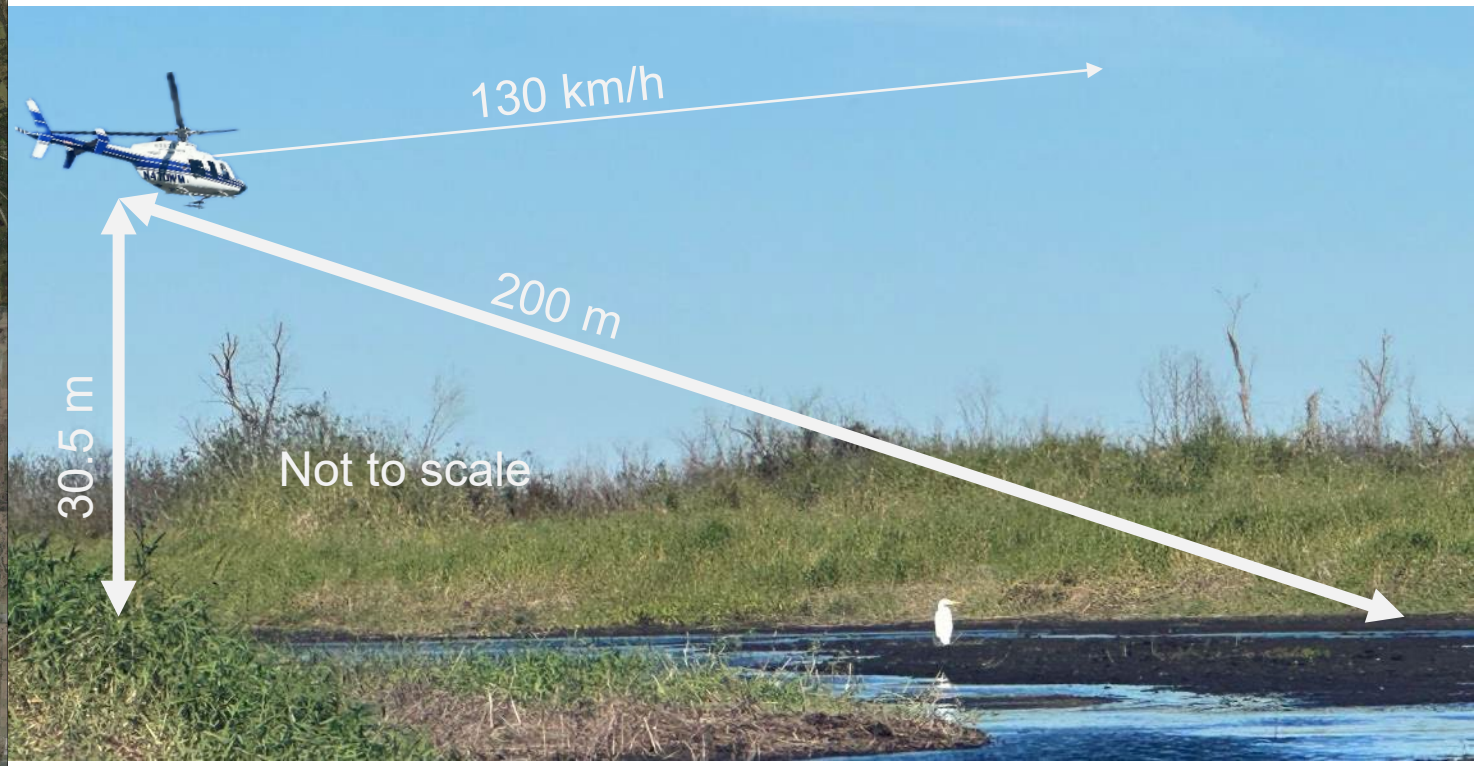
Negative Effects Of Channelization On Wading Birds



- **Loss of aquatic wading bird breeding colonies**
  - **-4 historical locations near river inactive**

Immature tricolored heron

Aerial Bird Surveys



- Monthly (November-May) east-west transects are randomly selected within the floodplain to cover 20% of the restored area
- Flown by helicopter at an elevation of 30.5 meters and approximately 130 kilometers per hour
- Wading birds within the 200 m transect strip are counted and identified.

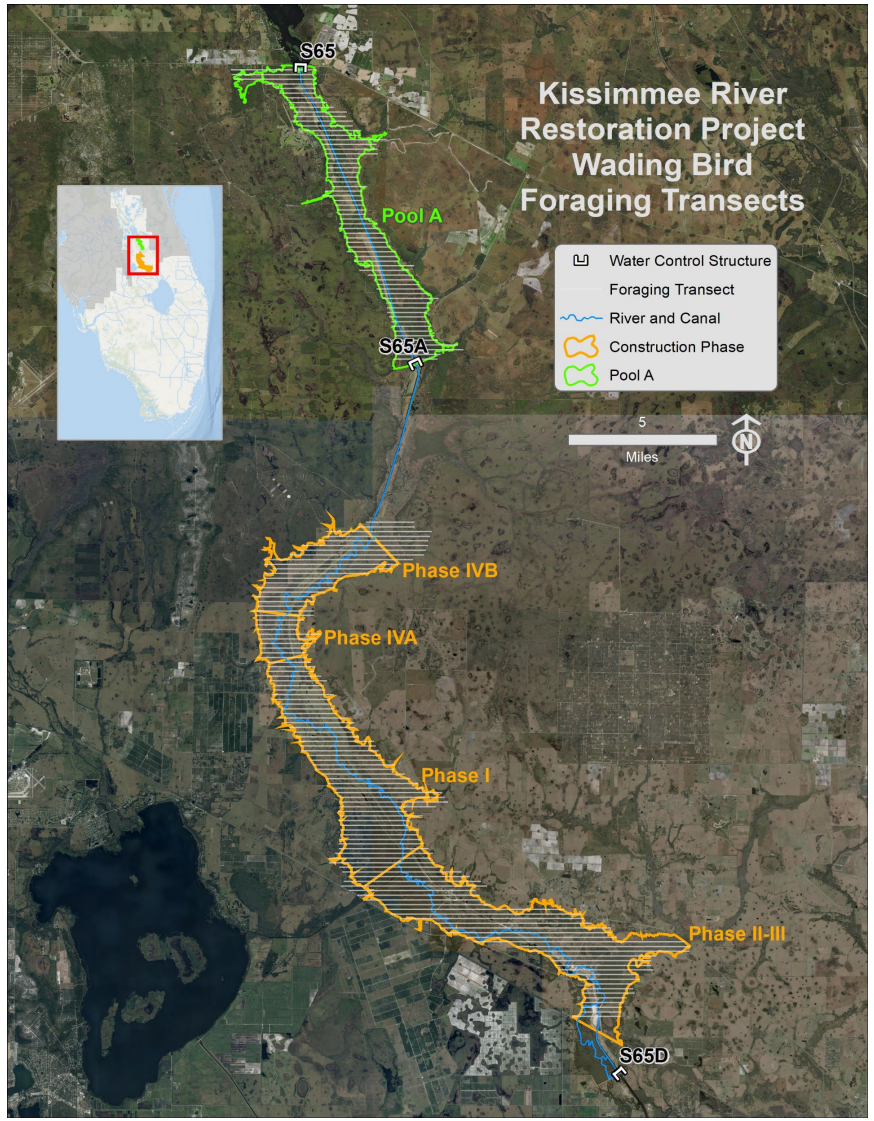
Avian prey sampling (throw trapping)

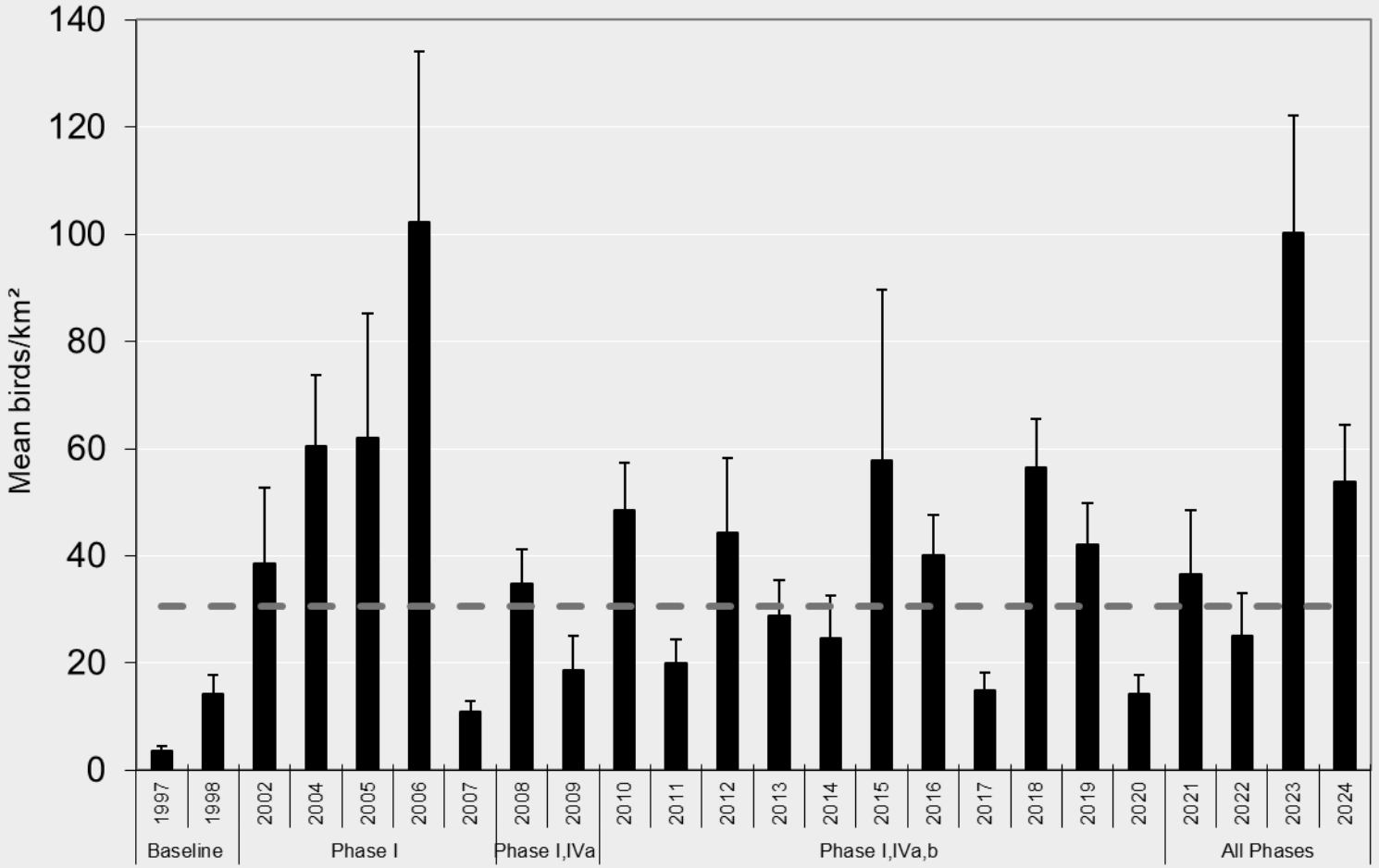
- Aquatic prey collected and identified
  - Fish
  - invertebrates

  (e.g., beetles, crayfish, and dragonflies)
  - Herpetofauna

  (e.g., tadpoles and salamanders)
- 3mm seine
- 1 sq m throw trap
- 24 throw traps per sampling event during the dry season

Yearly Wading Bird Response

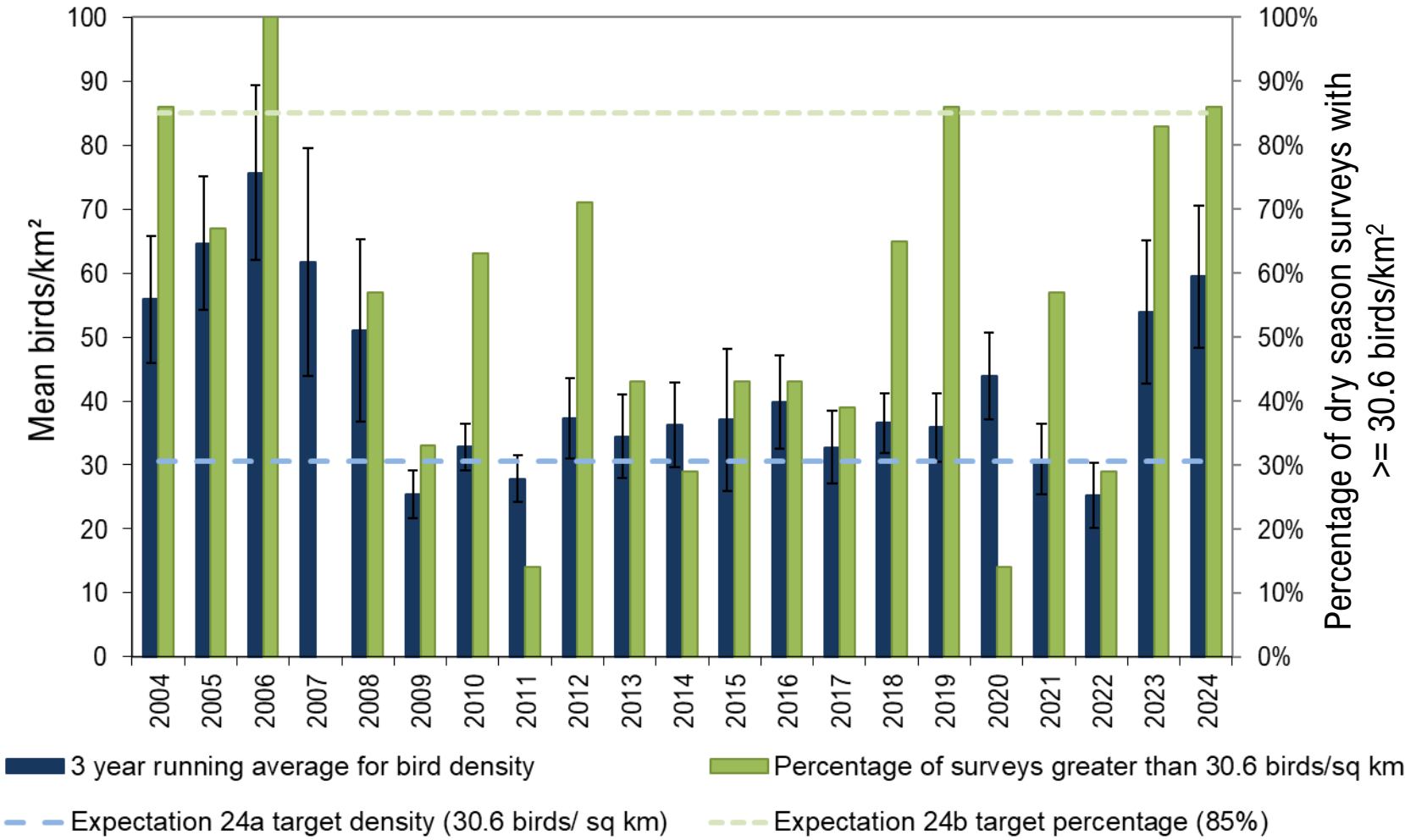




14 out of 22 years had over 30.6 birds per sq km, but…

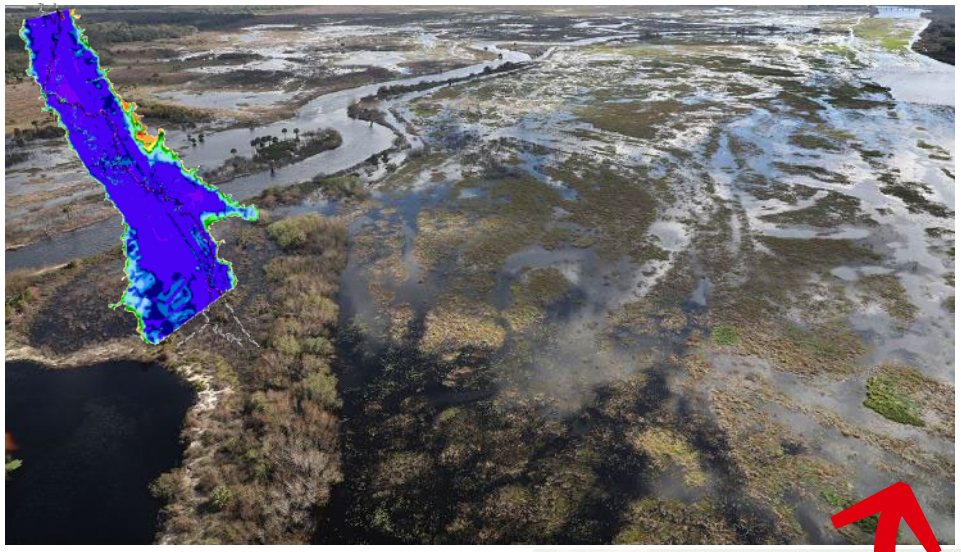
Wading Bird Response

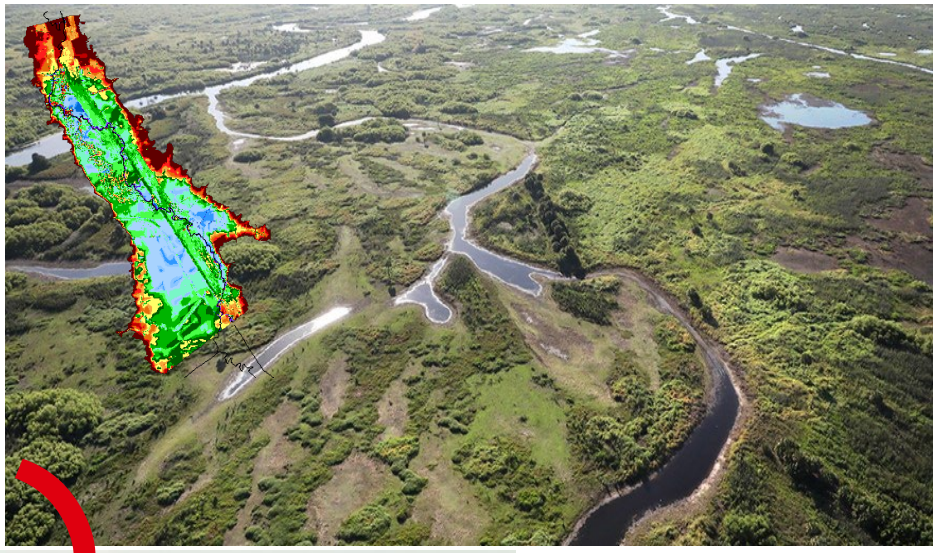
- As opportunistic, highly mobile foragers, wading birds often use the floodplain in large numbers in dry season when it is flooded, as reflected in the results for Expectation 24a (blue bars)
- However, because the floodplain often has no water for most of dry season, it is very rare to reach the Expectation 24b target in 85% of surveys (green bars)
- This reflects the inadequate current status of floodplain inundation (4 out of 22 years)



Expectation 24
[a] Mean annual dry season density of long-legged wading birds (excluding cattle egrets) on the restored floodplain will be ≥ 30.6 birds per square kilometer or birds/km2 (3-year running average) and
[b] at least 85% of the monthly surveys will have ≥ 30.6 birds/km^2

A river needs flow, but that's not the whole story

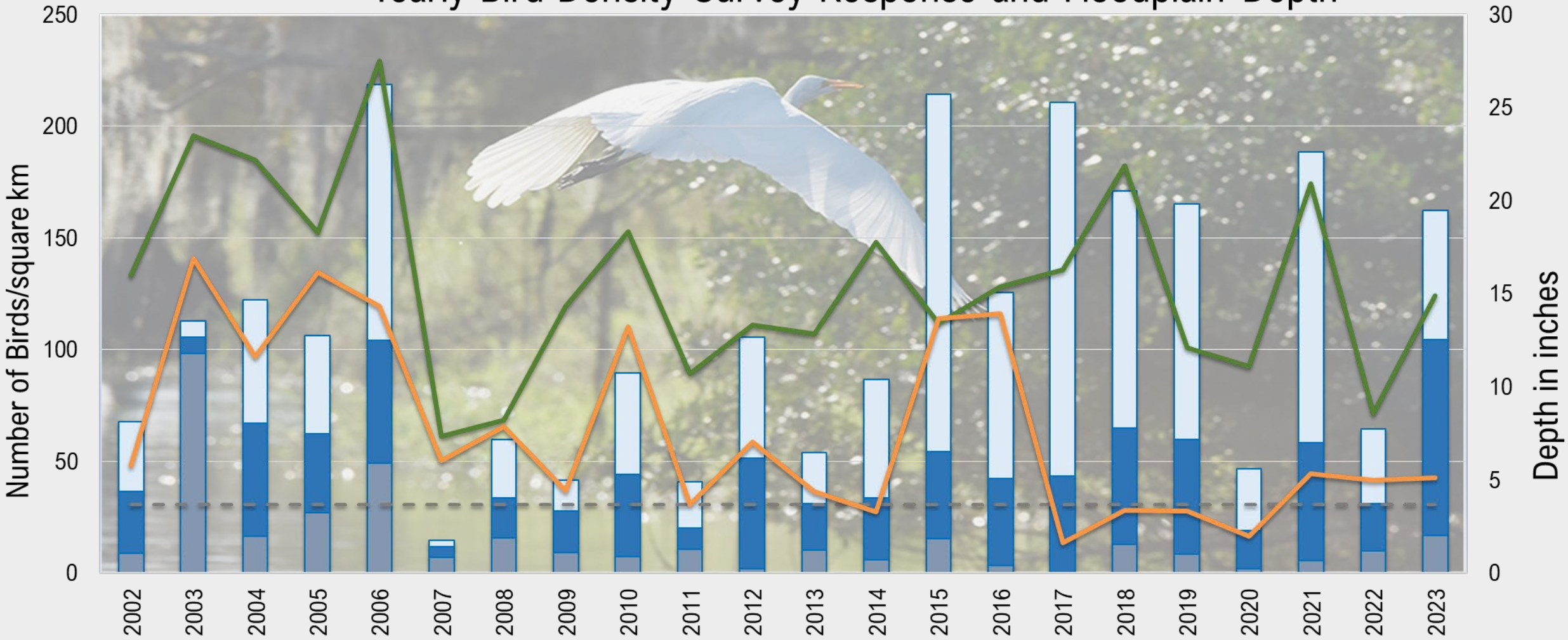


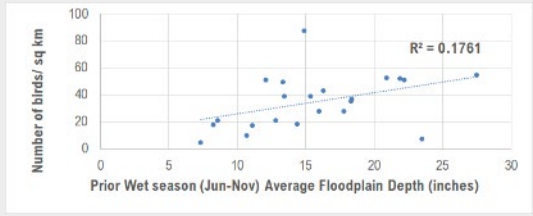


- **Sustained periods of higher flows are needed to restore a flood pulse to the floodplain**
- **what is needed is more and longer floodplain inundation, with slower transitions to a dry floodplain**

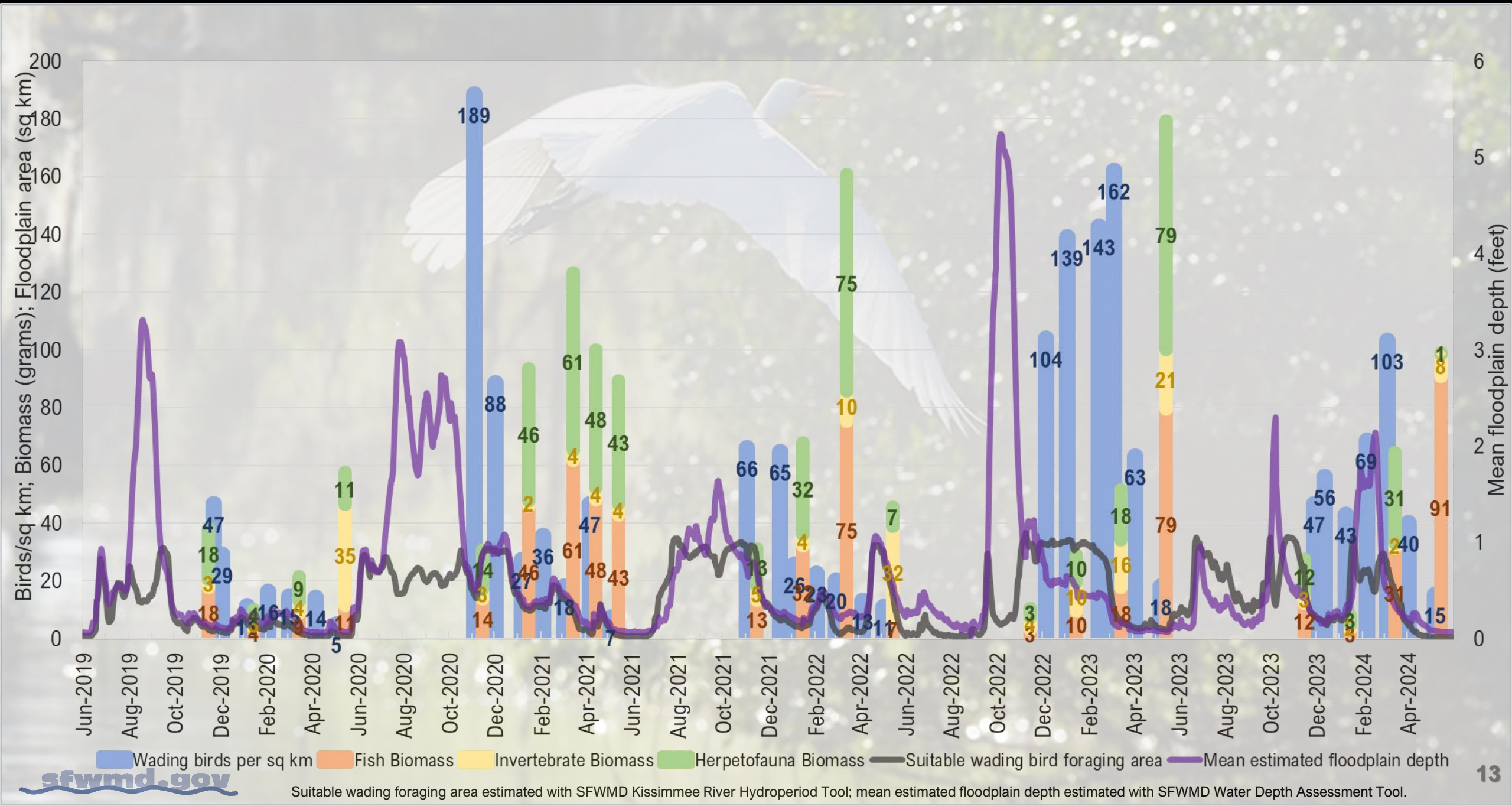
- **Wetland habitat should improve, aquatic prey should increase, then concentrate during the dry season**
- **wading bird response should be positive and more consistent**

Yearly Bird Density Survey Response and Floodplain Depth

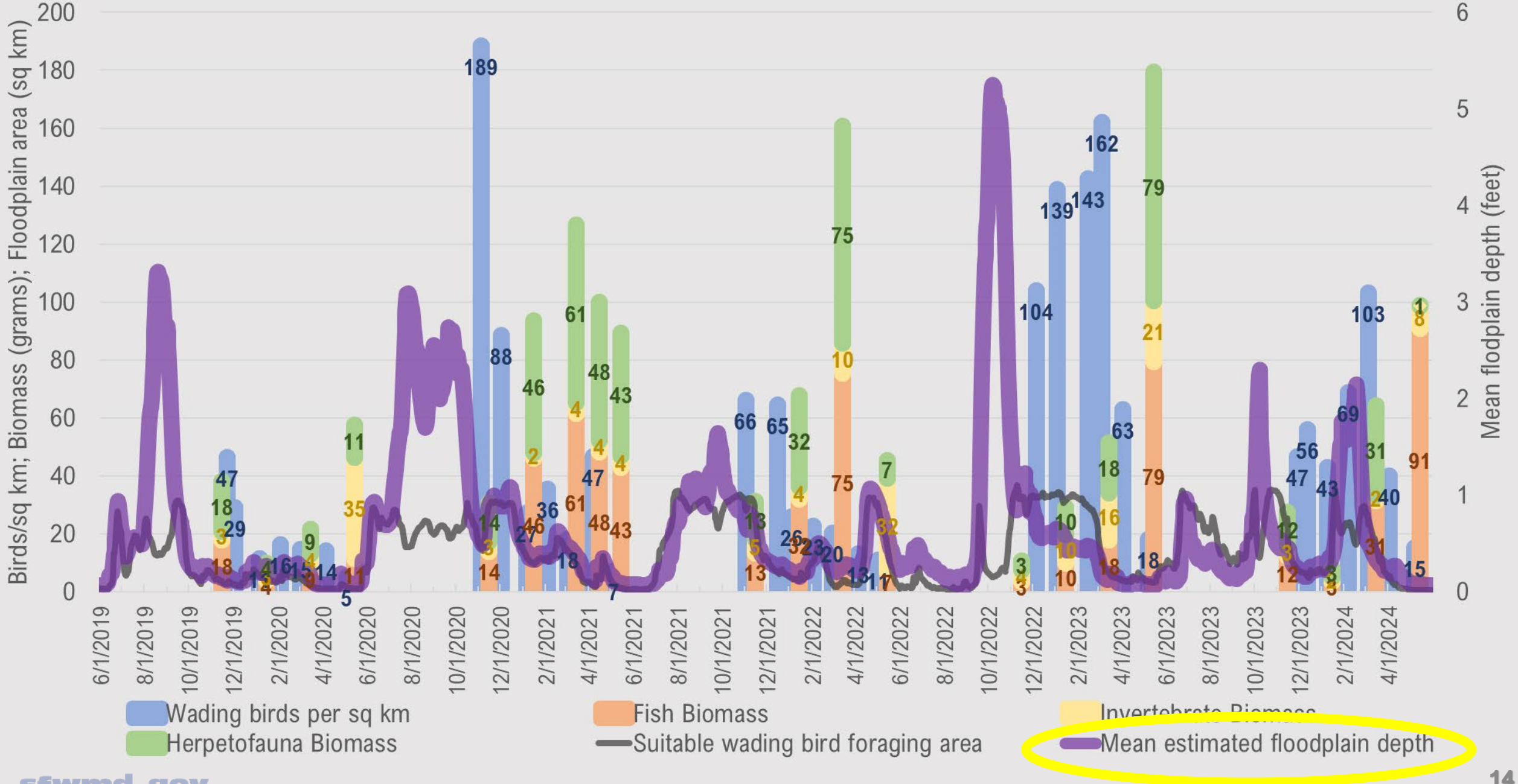




Mean estimated floodplain depth estimated with SFWMD Water Depth Assessment Tool.



Suitable wading foraging area estimated with SFWMD Kissimmee River Hydroperiod Tool; mean estimated floodplain depth estimated with SFWMD Water Depth Assessment Tool.



sfwmd.gov

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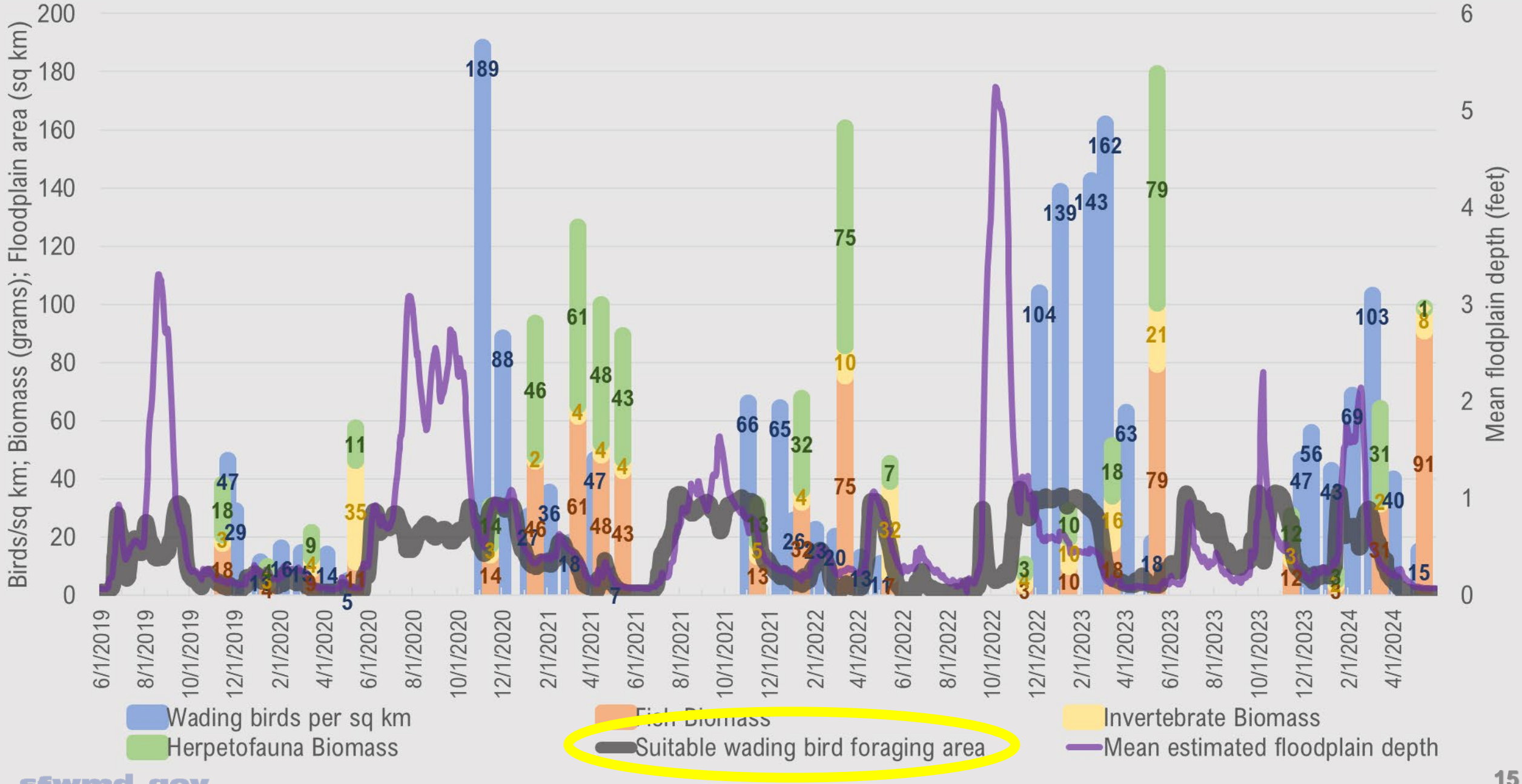

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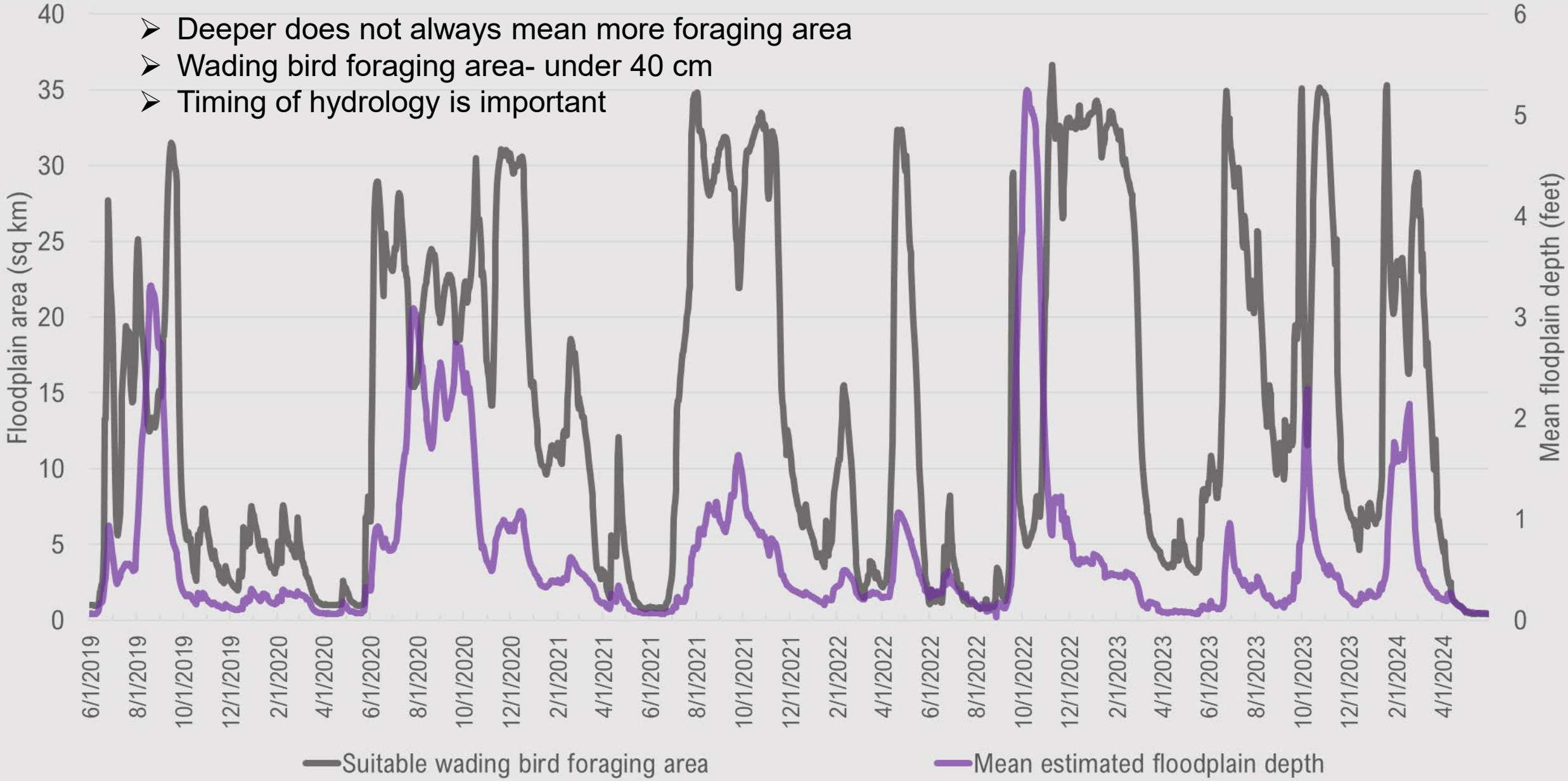
- Deeper does not always mean more foraging area
- Wading bird foraging area- under 40 cm
- Timing of hydrology is important



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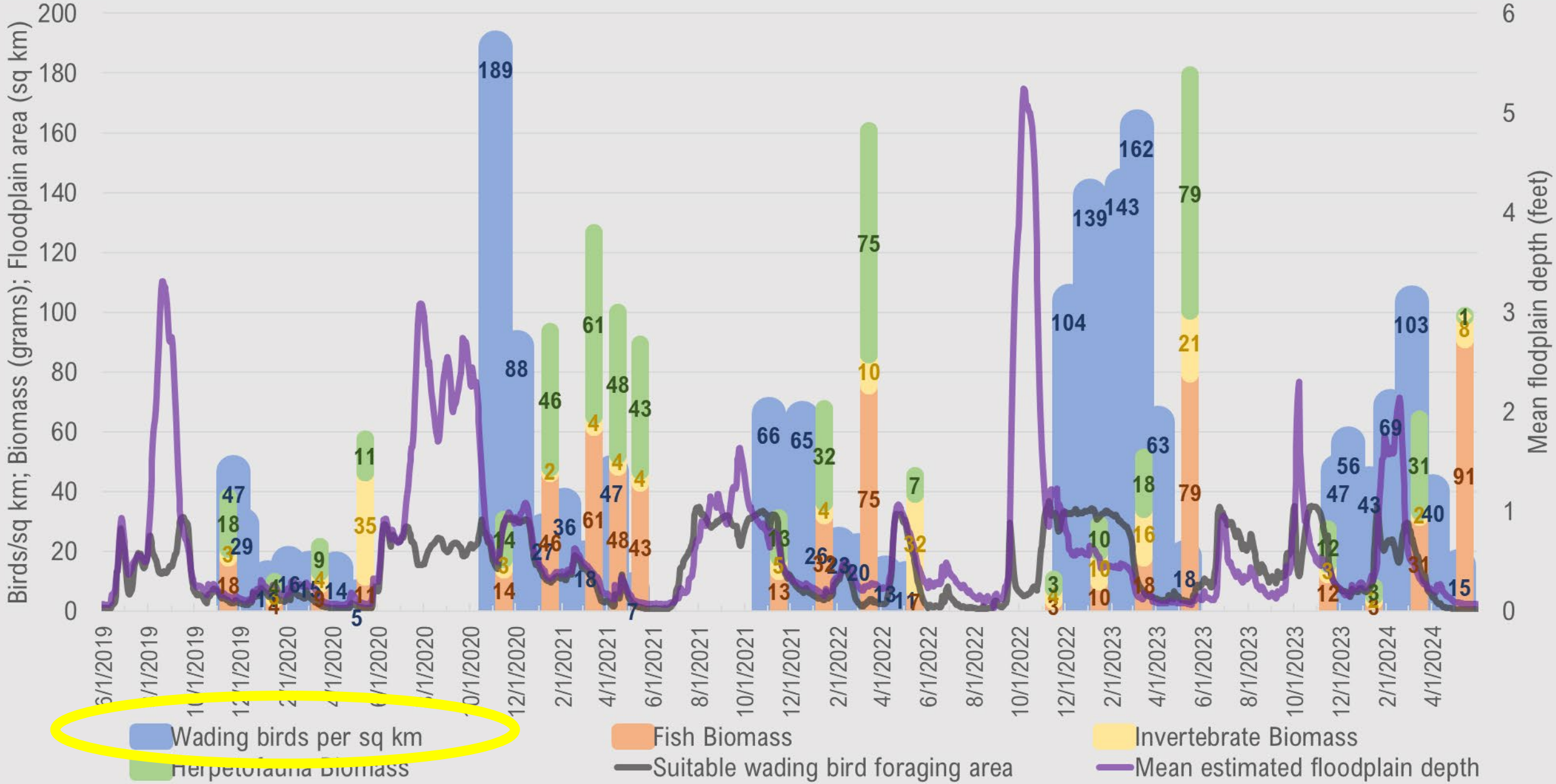

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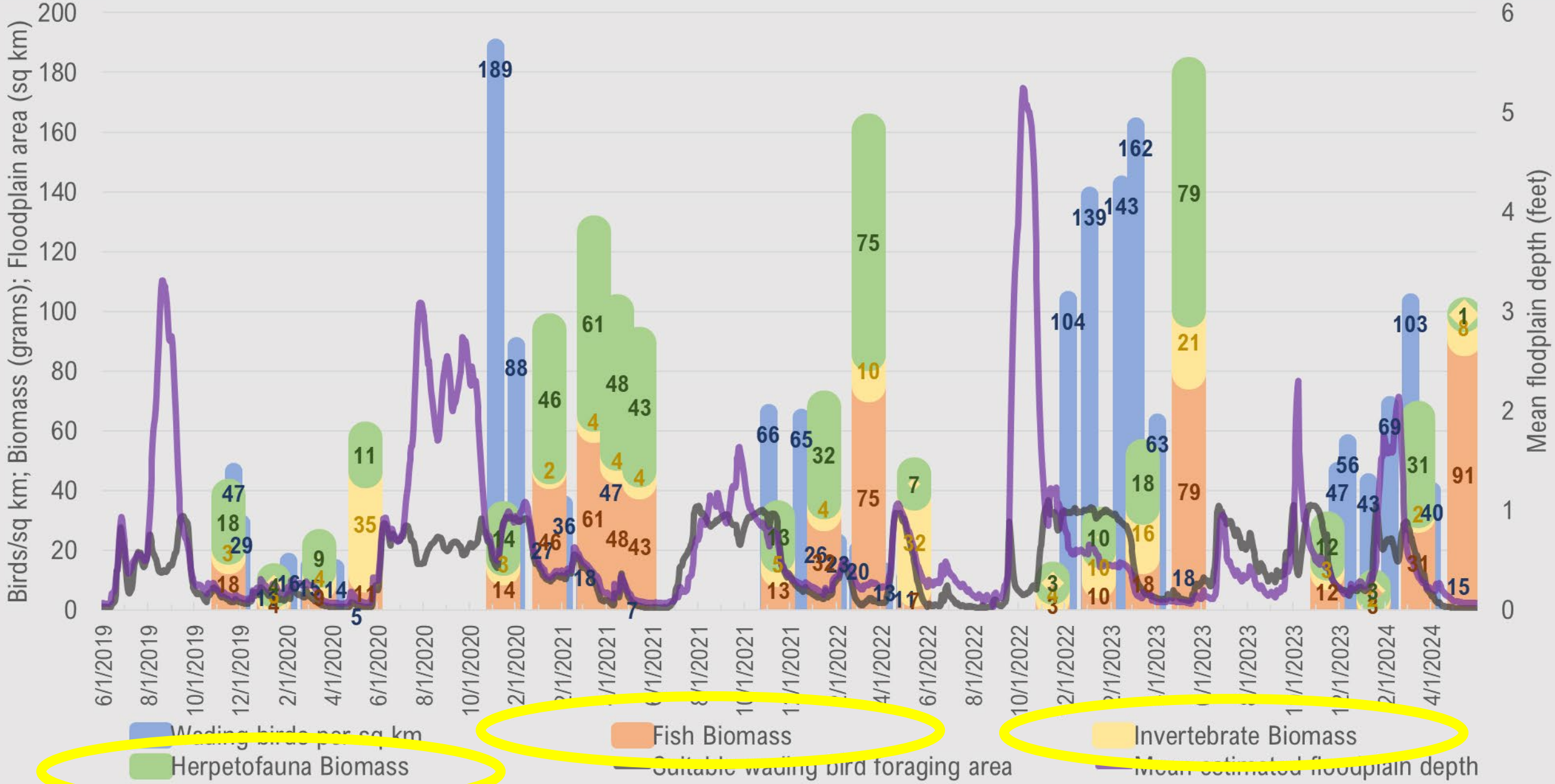

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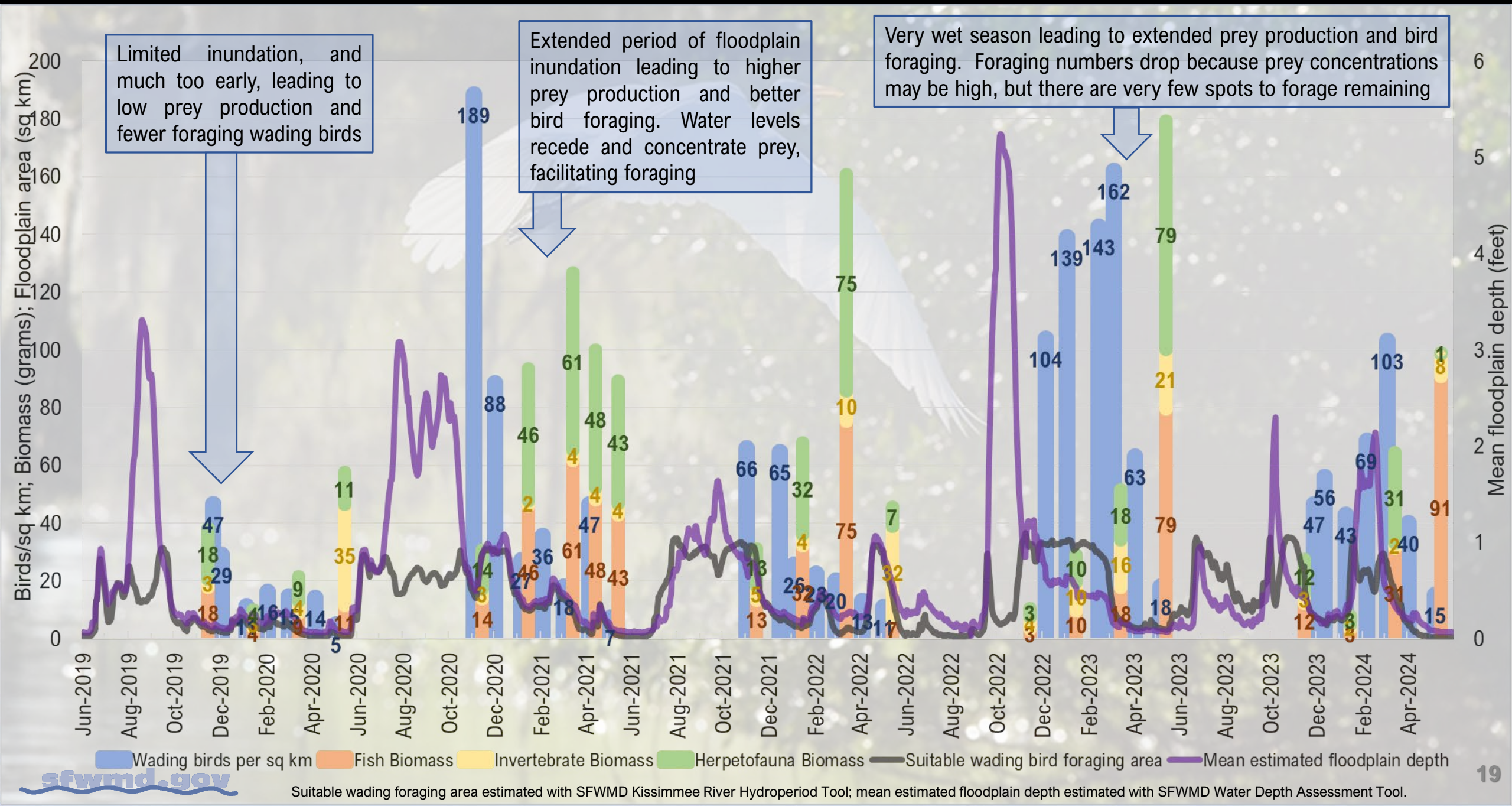

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Inundation on the floodplain near the end of the wet season

Foraging wading birds utilizing the drying marsh for access and concentration of prey

Receding water levels as the dry season progresses, but hopefully not too quick

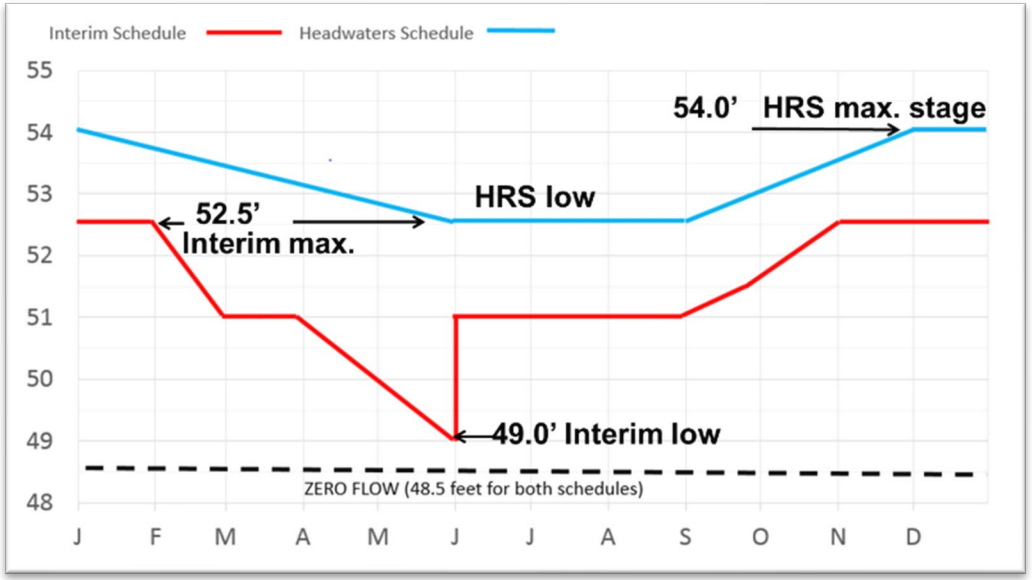
The other component of the restoration

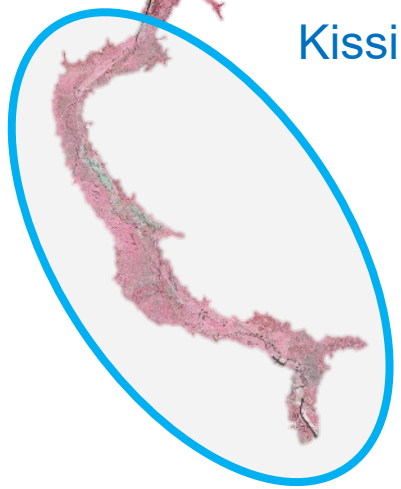
Headwaters Regulation Schedule

52.5’ vs. 54.0’ NGVD27*
(100,000 acre-feet of additional storage)

*NAVD88 is approximately 1.2’ less

Headwaters-KCH





Kissimmee River Restoration Area

- Increased storage
- Improved timing

OTHER ISSUES DURING INTERIM PERIOD?

INITIAL HEMI-MARSH AFTER INITIAL PHASE I

BUT SOON, EXOTIC GRASSES

AND MORE EXOTIC GRASSES

Where is the water?

Hemarthria altissima **(limpograss),** ***Urochloa mutica*** **(para grass),** ***Hymenachne amplexicaulis*** **(West Indian marsh grass)**

Experimental and operational treatments of exotics grasses on the floodplain, and reintroduction of fire

Conclusions and Discussion

- Wading birds are dependent on hydrologic driven wetland conditions
- Physical construction has been completed in the KRRP (2021)
- Restoring flow and timing of water is the next step of restoration
- Headwaters Regulation Schedule should help address the hydrology (~2027)
- Land and Vegetation mgmt. activities should help with the recovery of quality habitat once HRS is fully implemented
- With functioning wetlands, aquatic animals should thrive
- With an increased prey base, diverse populations of wading birds should continue to expand
- Wading bird numbers should be more consistent during the dry season with less seasonal flashiness and longer hydroperiods
- Evaluation of project success, including wading bird response, will continue for at least five years past project completion

Thank you!