Strategic Habitat Conservation

Aquatic Habitat Assessment and Data Acquisition- Large River Floodplain Ecosystems

Baton Rouge Fish and Wildlife Conservation Office
Private John Allen National Fish Hatchery
St. Catherine's Creek National Wildlife Refuge
Gulf Coastal Plains / Ozarks LCC
Inventory and Monitoring Initiative
Southeastern Aquatic Resource Partnership

How it Started

Finding a Place for Fisheries in SHC/LCC directives:

Why the Lower Mississippi River Floodplain?

Largest and Most Productive Aquatic Ecosystem in the GCPO LCC Geography and One of the Most Impacted Systems in the Nation

GCPO LCC - Support for Alligator Gar as a Pilot Species

Strong Support From States Partners as a Species of Concern in an "At Risk Habitat"

NFHAP/SARP Have Existing Efforts on Smaller Rivers and Streams at the Regional and National Scale

- *Riparian Habitat Assessment, In-Stream Flow Network
- *Incorporating State Comprehensive Wildlife Conservation Strategies into a SAHP

LMRCC

- * Main-Stem and Side Channel

Pvt. John Allen National Fish Hatchery – Hatchery Matrix Model – Alligator Gar

This species is most commonly found in slower moving rivers, oxbows, reservoirs, and brackish estuaries along the Gulf of Mexico, but they have also been occasionally found further out in salt water. Spawning occurs over flooded vegetation in shallow, slow to calm waters adjacent to deeper backwaters, tributaries, oxbows, or sheltered deep water areas when waters reach a sustained temperature of 72 degrees F. These habitats exist in this particular BPU during seasonal flood events occurring on the Mississippi River and associated floodplain areas. Due to a lack of life history data there are a lot of uncertainties relating to alligator gar. Some of these uncertainties could be alleviated by determining the relationship between photoperiods and spawning events, determine both optimal and conducive water quality parameters, etc. Availability of each of these is greatly influenced by available habitats.

Process for Selection of Surrogate Species and Setting Population Objectives

Step 1: Develop and clearly specify the management or conservation objectives for surrogate species selection approach

Maintain functional floodplain habitats in the Lower Mississippi River Valley

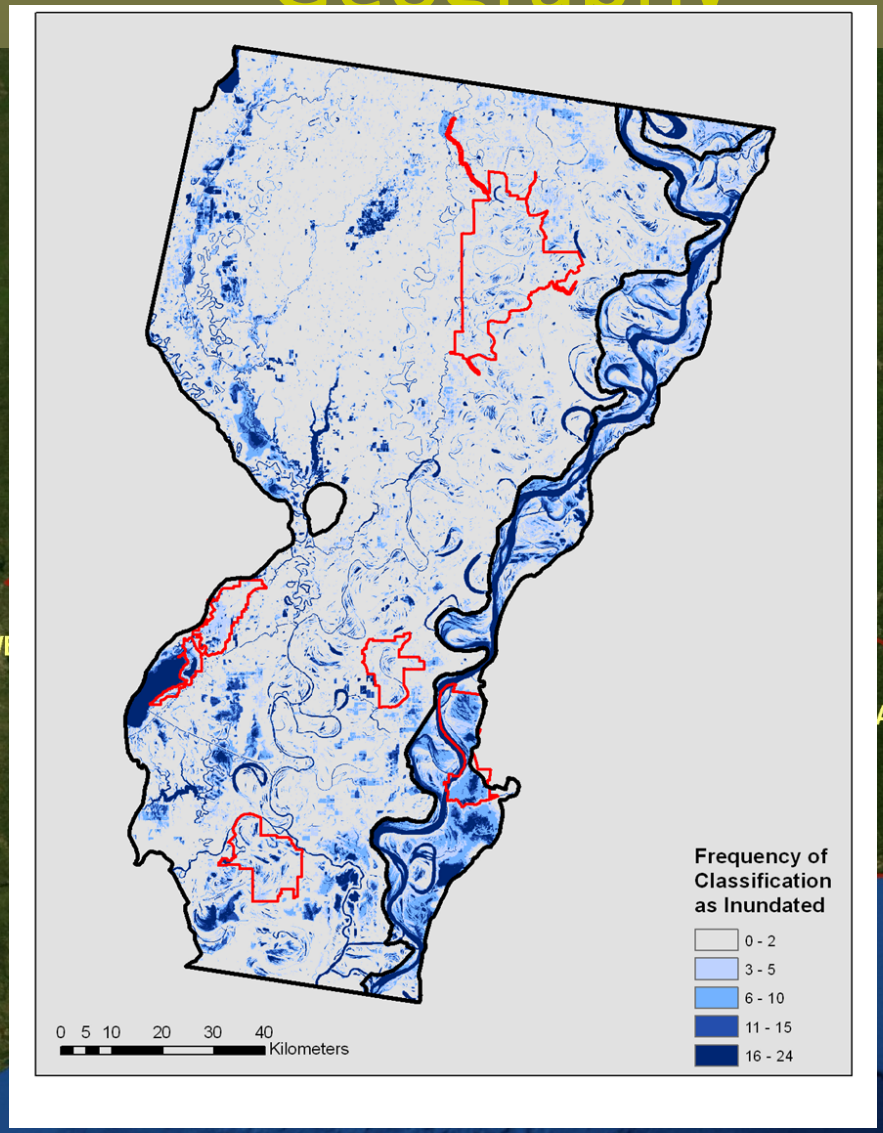
Process for Selection of Surrogate Species and Setting Population Objectives

Step 1: Develop and clearly specify the management or conservation objectives for surrogate species selection approach

Step 2: Identify geographic scale

All aquatic habitat inside the levee system of the LMV, including permanent waters and ephemeral floodplain wetlands.

Gulf Coastal Plains and Ozarks LCC Geography



Process for Selection of Surrogate Species and Setting Population Objectives

Step 1: Develop and clearly specify the management or conservation objectives for surrogate species selection approach

Step 2: Identify geographic scale

Step 3: Determine which species to consider

Blue catfish, channel catfish, alligator gar, shad, buffalo, largemouth bass, paddlefish, white crappie (other floodplain dependent species)

Process for Selection of Surrogate Species and Setting Population Objectives

Step 1: Develop and clearly specify the management or conservation objectives for surrogate species selection approach

Step 2: Identify geographic scale

Step 3: Determine which species to consider

Step 4: Select criteria to use in determining surrogate species

A surrogate should be one that is:

* Easily observed or captured
* Represents as many other species in the floodplain
* Cost effective to monitor
* Supported by an existing biological knowledge base
* Responsive to a wide variety of conservation efforts

Process for Selection of Surrogate Species and Setting Population Objectives

Step 1: Develop and clearly specify the management or conservation objectives for surrogate species selection approach

Step 2: Identify geographic scale

Step 3: Determine which species to consider

Step 4: Select criteria to use in determining surrogate species

Step 5: Establish surrogates

Alligator Gar

Process for Selection of Surrogate Species and Setting Population Objectives

Step 1: Develop and clearly specify the management or conservation objectives for surrogate species selection approach

Step 2: Identify geographic scale

Step 3: Determine which species to consider

Step 4: Select criteria to use in determining surrogate species

Step 5: Establish surrogates

Step 6: Identify species requiring special attention

T&E (pallid sturgeon)
Species of concern (paddlefish)
Invasive species (Asian carp, northern snakehead fish)
Inter-jurisdictional (striped bass)

Process for Selection of Surrogate Species and Setting Population Objectives

Factors being established on St Catherine Creek that can be used to set conservation targets in the LMV

- Habitat specific community targets

    1. Functional guilds
    2. Diversity
    3. Species Composition

Process for Selection of Surrogate Species and Setting Population Objectives

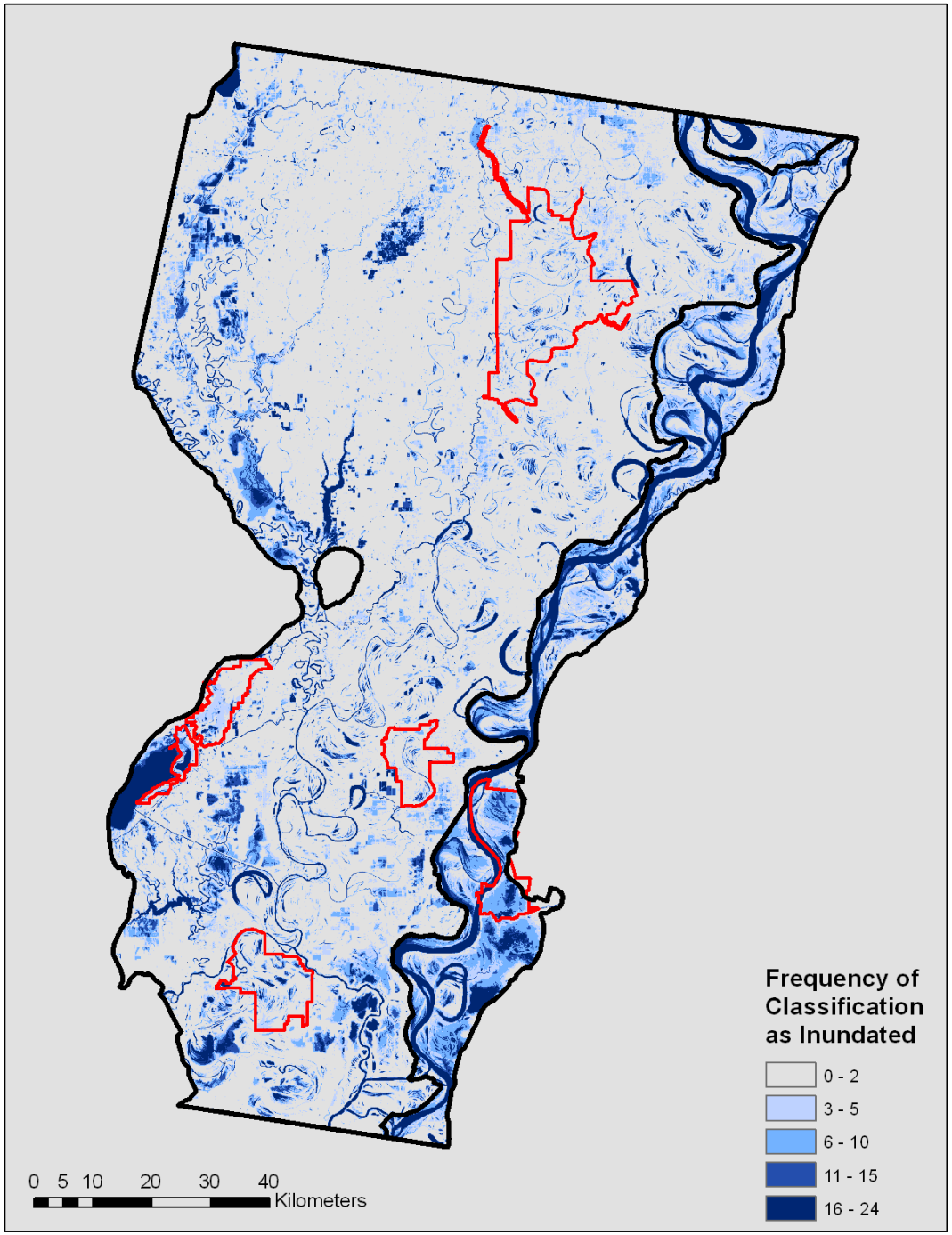
Set up field research to verify associations between surrogates and habitat characteristics

- Gar – telemetry and netting to verify habitat use
- Community - habitat specific netting to determine species assemblages found in a diversity of habitat types

1. Gar in association with paddlefish, crappie, catfish and other recreational significant species = good water quality conditions

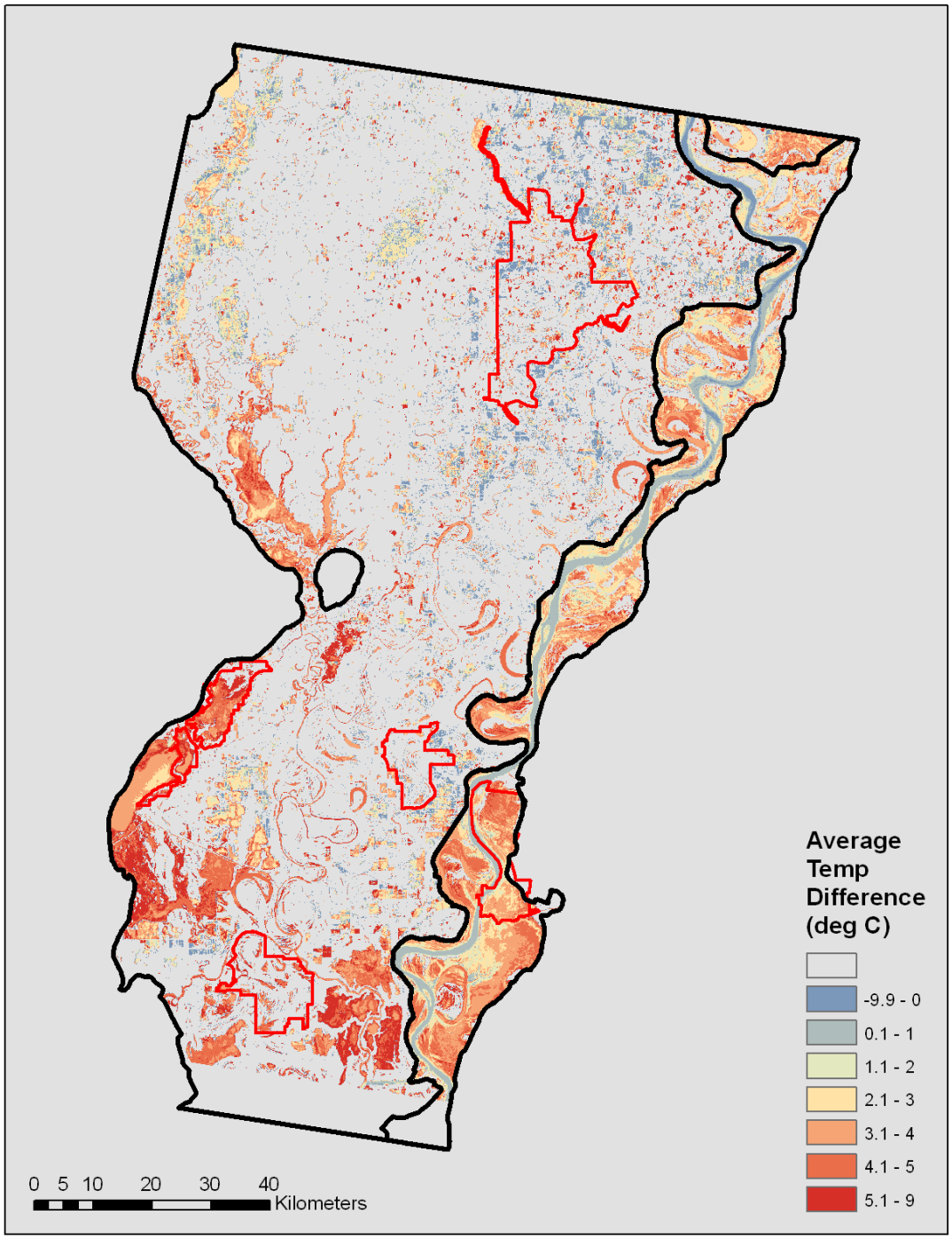
2. Gar in association with bowfin, warmouth, drum, flier = less than optimal water quality conditions

Frequency of Inundation - composite from 24 cloud-free, leaf-off images and a range of river stages



Credit:
Yvonne Allen, ERDC, Baton Rouge

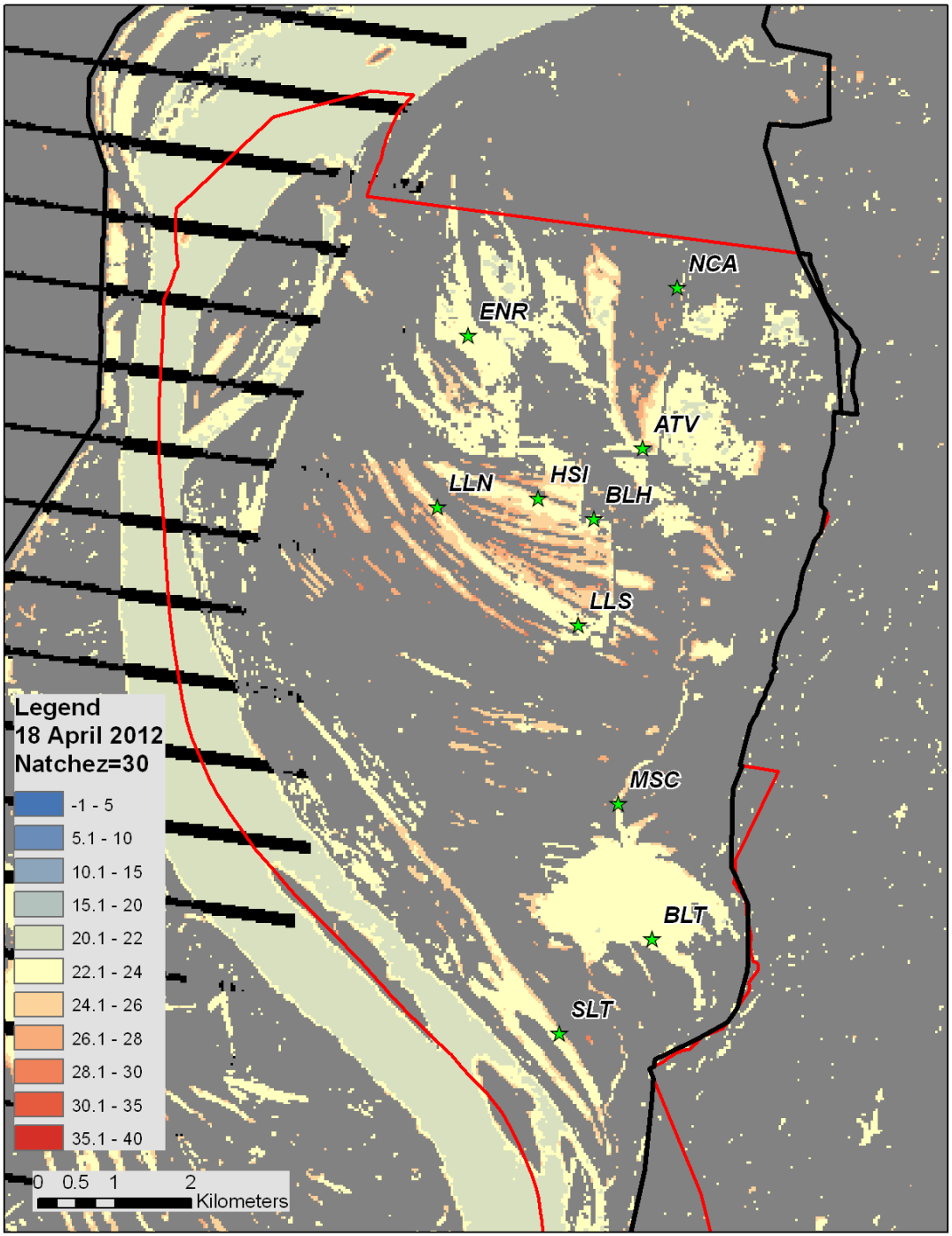
Floodplain thermal refuge - composite from 24 images and a range of river stages



Credit:
Yvonne Allen, ERDC, Baton Rouge

Combining landscape analysis with *in situ* monitoring

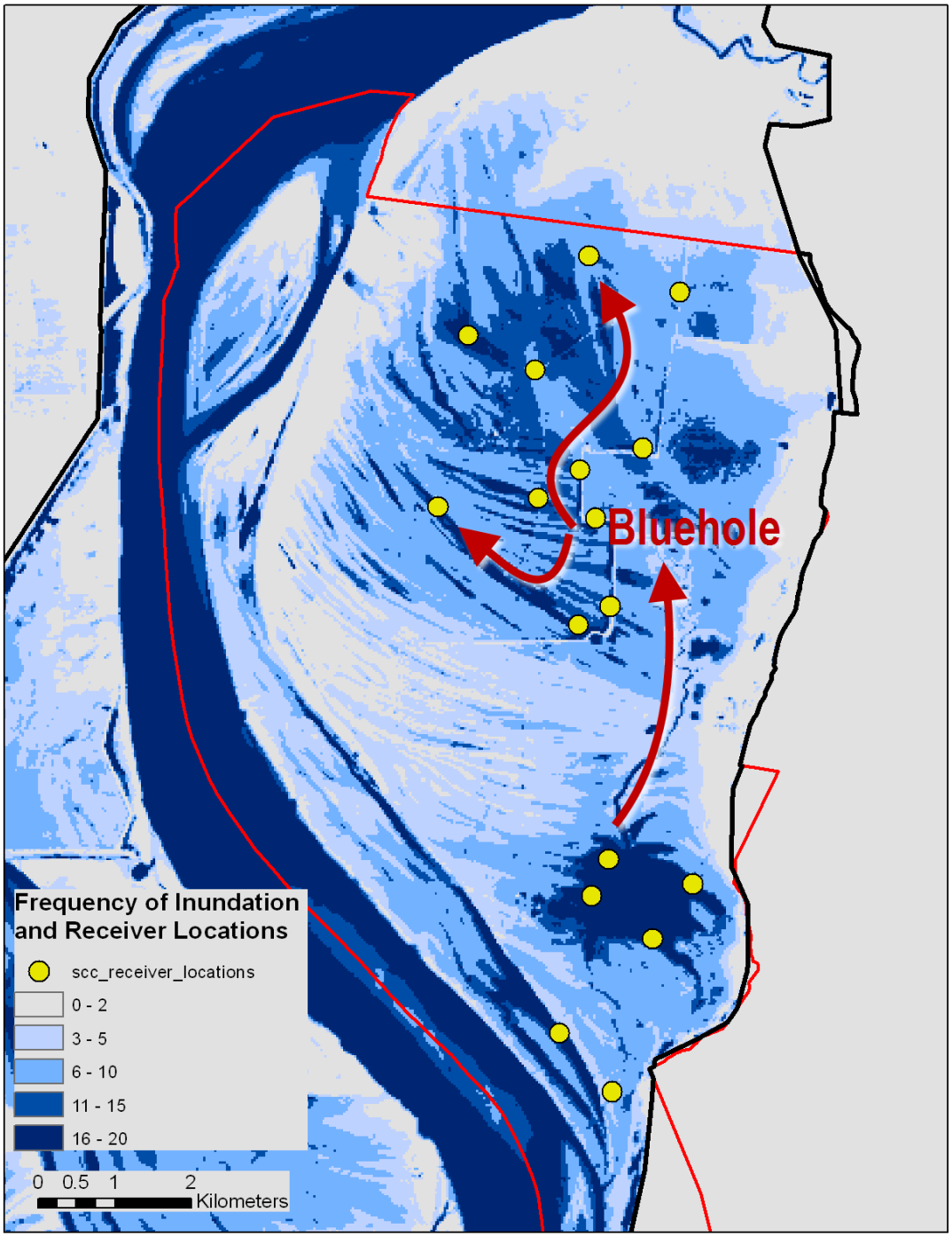
18 Apr 2012 thermal image with inundation mask and YSI logger locations



Credit:
Yvonne Allen, ERDC, Baton Rouge

2012 Alligator Gar Telemetry Results-

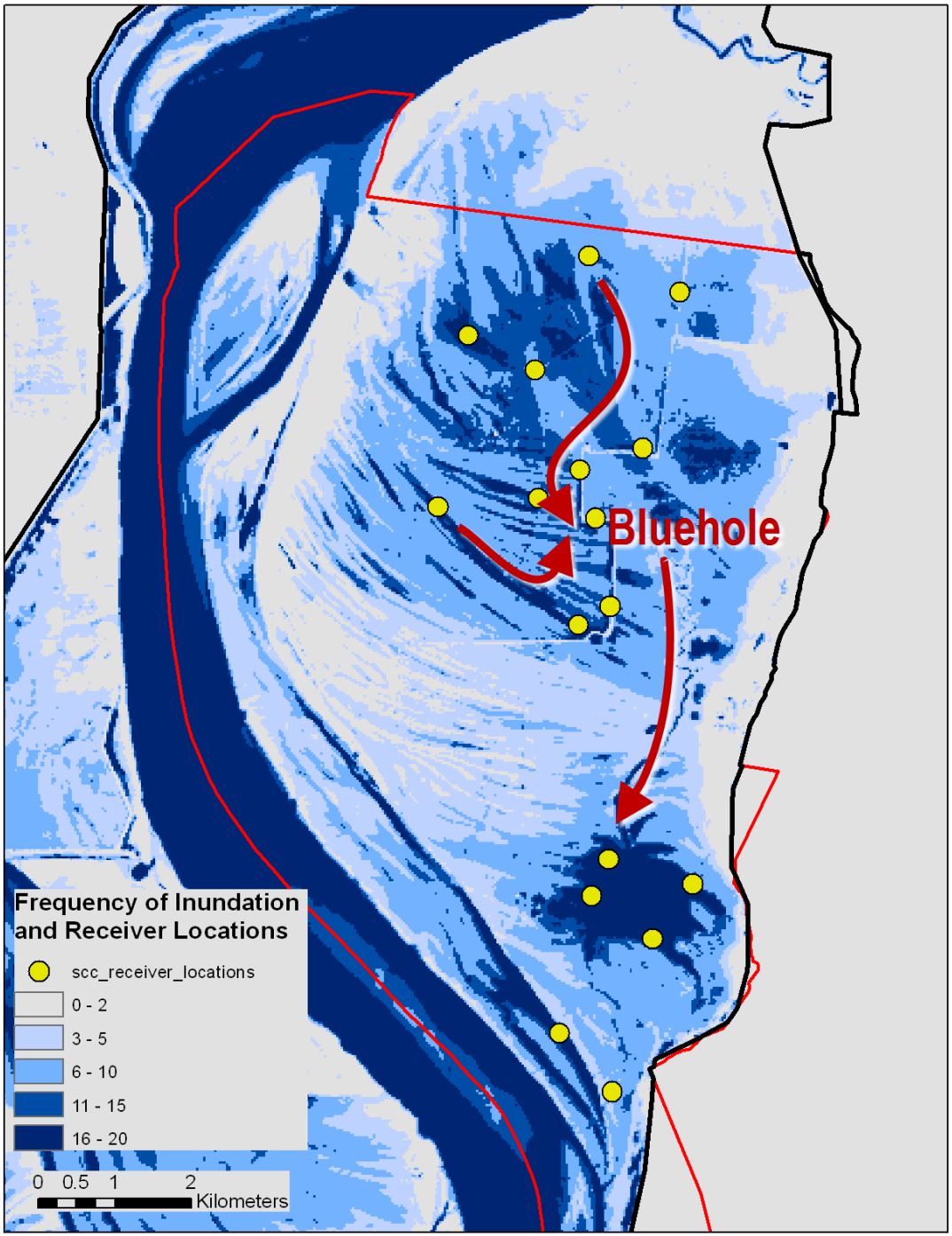
- Rising river
- Temperature just becoming suitable
- Movement up on to warmest ag fields for spawning



Credit:
Yvonne Allen, ERDC, Baton Rouge

2012 Alligator Gar telemetry results-

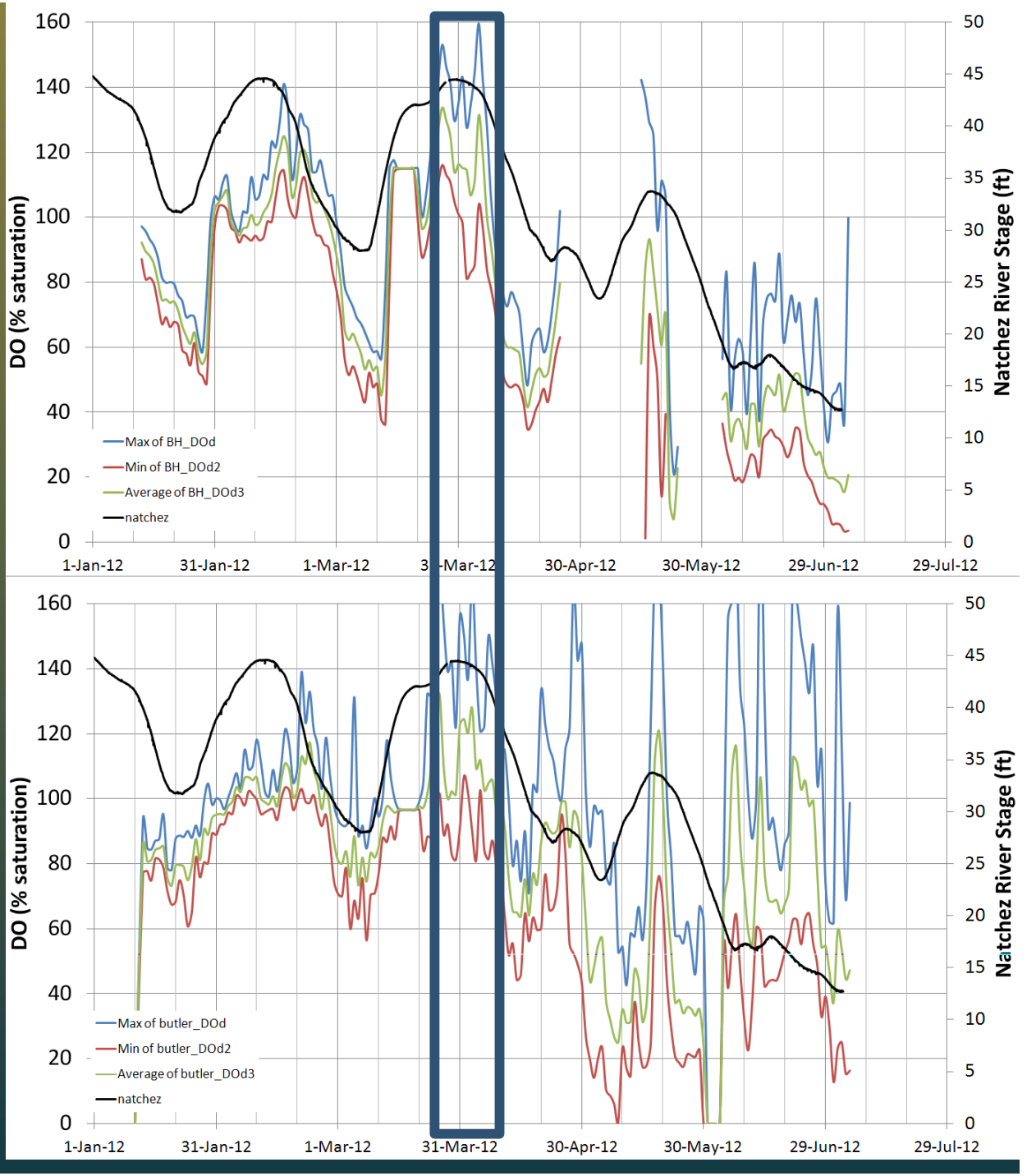
- River crests and falls
- Post spawning
- Retreat back to Bluehole and Butler Lake



Credit:
Yvonne Allen, ERDC, Baton Rouge

in situ WQ monitoring

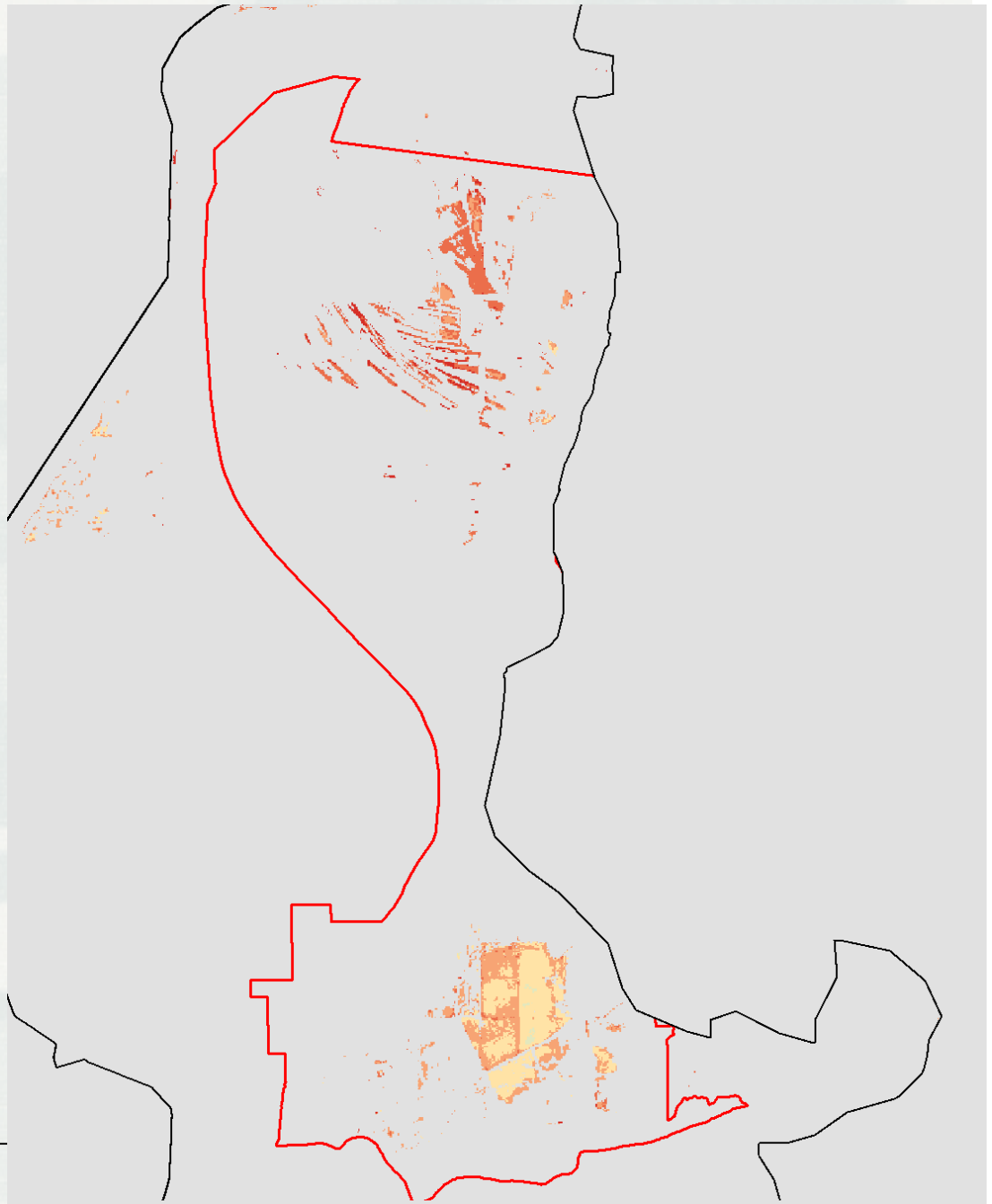
Daily fluctuations in DO increases greatly with a slack or falling river.



Credit:
Yvonne Allen, ERDC, Baton Rouge

Preliminary critical landscape characteristics for AG spawning

- River connectivity
- Frequently inundated (related to floodwater duration -1/2 of images)
- Possible positive association with open cropland habitats
- Warmest location in the floodplain



Credit:
Yvonne Allen, ERDC, Baton Rouge

Process for Selection of Surrogate Species and Setting Population Objectives

Step 1: Develop and clearly specify the management or conservation objectives for surrogate species selection approach

Step 2: Identify geographic scale

- Unknown distribution throughout historical range
- Behavioral attributes in response to environmental conditions not fully documented
- Young of year recruitment rates unknown

Step 6: Identify species requiring special attention

Step 7: Identify population objectives

Step 8: Test for logic and consistency

Step 9: Identify knowledge gaps and uncertainties

Process for Selection of Surrogate Species and Setting Population Objectives

Step 1: Develop and clearly specify the management or conservation objectives for surrogate species selection approach

Step 2: Identify geographic scale

Step 3: Determine which species to consider

- DELIVER CONSERVATION!!!!
- Use feedback from post-conservation monitoring to validate relationships between altered habitat characteristics and population targets
- Continue developing models, spatial analytical products, and decision support tools to improve conservation planning and design

Step 10: Monitor the effectiveness of the approach