Brandenbark™: Mitigation Tool for Projects Involving Federally Listed Bark Roosting Bats

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Fort Knox
Fish and Wildlife

REPLICATIONS UNLIMITED

COPPERHEAD CONSULTING

Multiple artificial roost types attempted in the past in several states

Success of Previous Designs

- Indianapolis Airport
  - 3,204 artificial structures representing 9 designs
  - After 10 years, 6 boxes were showing signs of use by MYSO. “Structures were not extensively used until they were in place nearly a decade” (Sparks et al. 2009)
  - Two (of 715) single style bat boxes were documented to be used as primary MYSO maternity roosts (Whitaker et al. 2006)

Success of Previous Designs

- Camp Atterbury (Indiana)
  - Approximately 38 roosts installed (artificial bark and rocket boxes, Tim Carter Pers. Comm.)
    - 3 rocket boxes were used in 2010 as MYSO primary maternity roosts (Copperhead 2010)
- Southern Illinois (Carter et al. 2006)
  - 7 structures: 1 double rocket box, 2 jumbo single rocket boxes, 3 single rocket boxes and 1 PVC tube house were installed
    - 1 double rocket box and 2 jumbo single rocket boxes were used by Indiana bats including maternity activity. Single rocket boxes had only little brown use and PVC tube house had use by unknown species (overall, 43% MYSO use)

Success of Previous Designs

- Canoe Creek Pennsylvania: 61 unique MYSO documented using artificial roosts, including maternity use (Butchkoski and Turner 2009)
  - Church attic: modified with plywood slats
  - Aluminum shell bat boxes
  - Garage attic: modified with slats
  - Bat condo

Habitat Enhancement at Fort Knox

- 3 treatments (2007)
  - Natural bark
  - Fiberglass artificial bark
  - Eco-Shake shingles
- Documented use
  - Fiberglass artificial bark
  - Eco-Shake shingles
- “Bigger is better” – Mike Brandenburg

BrandenBark™ is born

- Worked with Replications Unlimited to create BrandenBark™
- Backs treated to create texture
- Available in several bark patterns mimicking different tree species

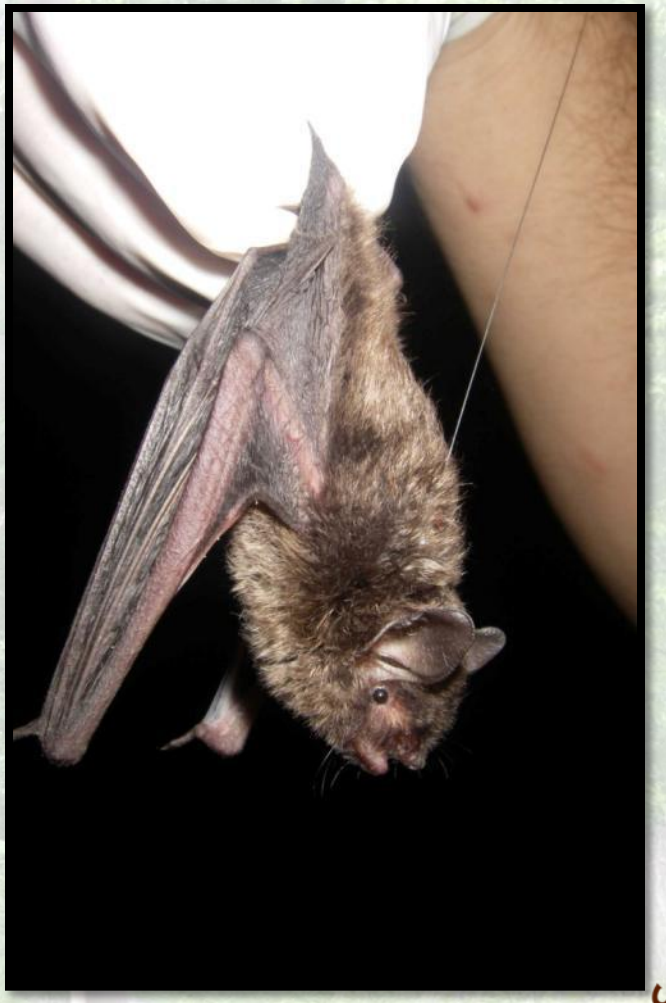
Field Testing

- BrandenBark™ attached to 14 standing snags (2009-2011)
- 15 artificial trees were installed (2012-2013)
- Total of 29 BrandenBark™ structures placed over 5 years at Ft. Knox

It Works

It Works!

- To date > 70% of all BrandenBark™ structures have been used
- 60 emergence counts with an average of 84.9±11.0 bats exiting
- Indiana bat maternity use confirmed with telemetry and netting
- 6 species of bats have been captured exiting BrandenBark™



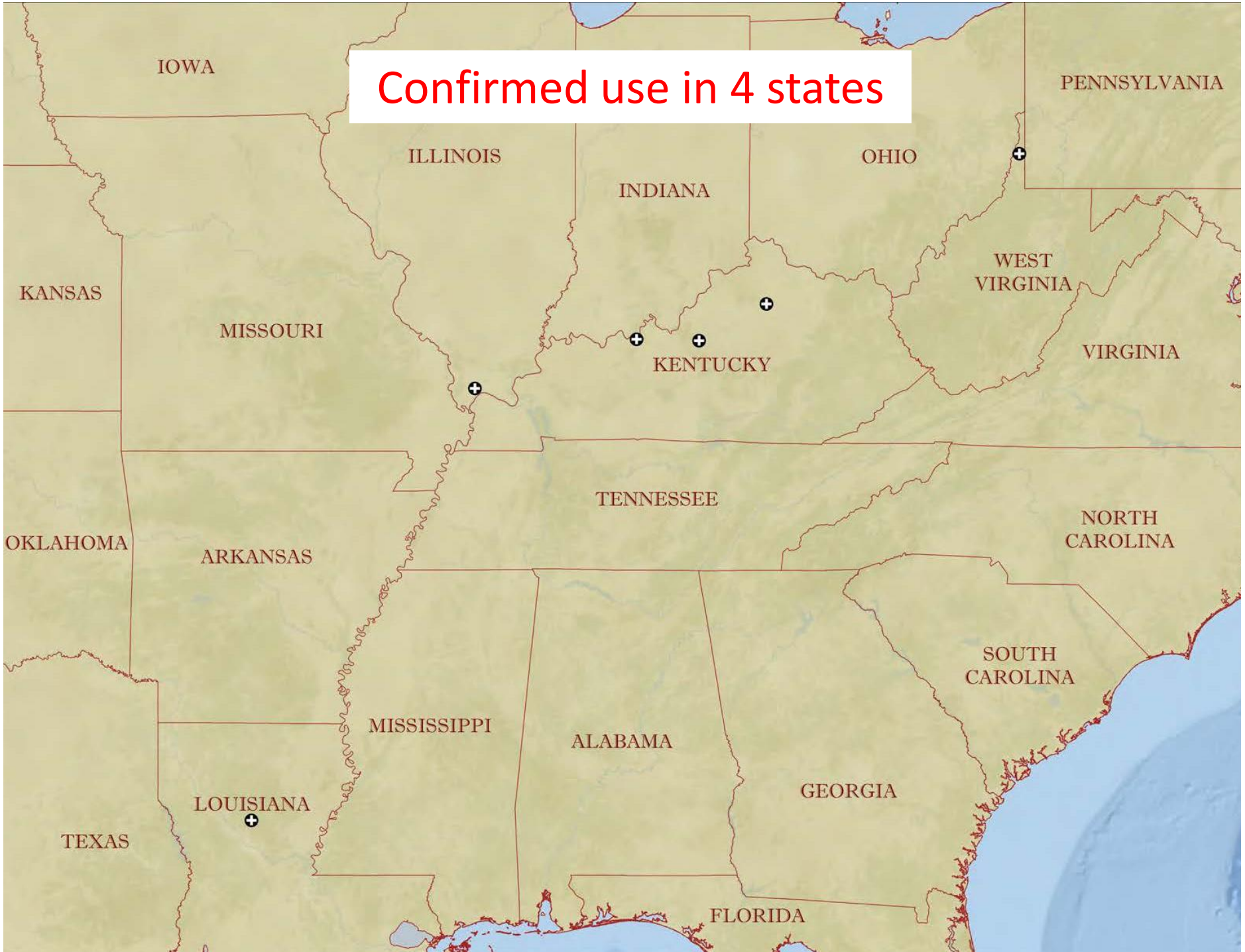
Maternity Use

- 195 adult females and 97 juvenile MYSO captured exiting roosts
- Largest exit count during maternity season

  (n = 451)
- Colony has returned to BrandenBark™ for 6 years and counting

BrandenBark™ Artificial Trees

- Within two months, all artificial trees were used by bats
- Majority of artificial trees had confirmed MYSO use
- 81% of captures were MYSO


Confirmed use in 4 states
IOWA
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INDIANA
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KANSAS
MISSOURI
KENTUCKY
WEST VIRGINIA
VIRGINIA
TENNESSEE
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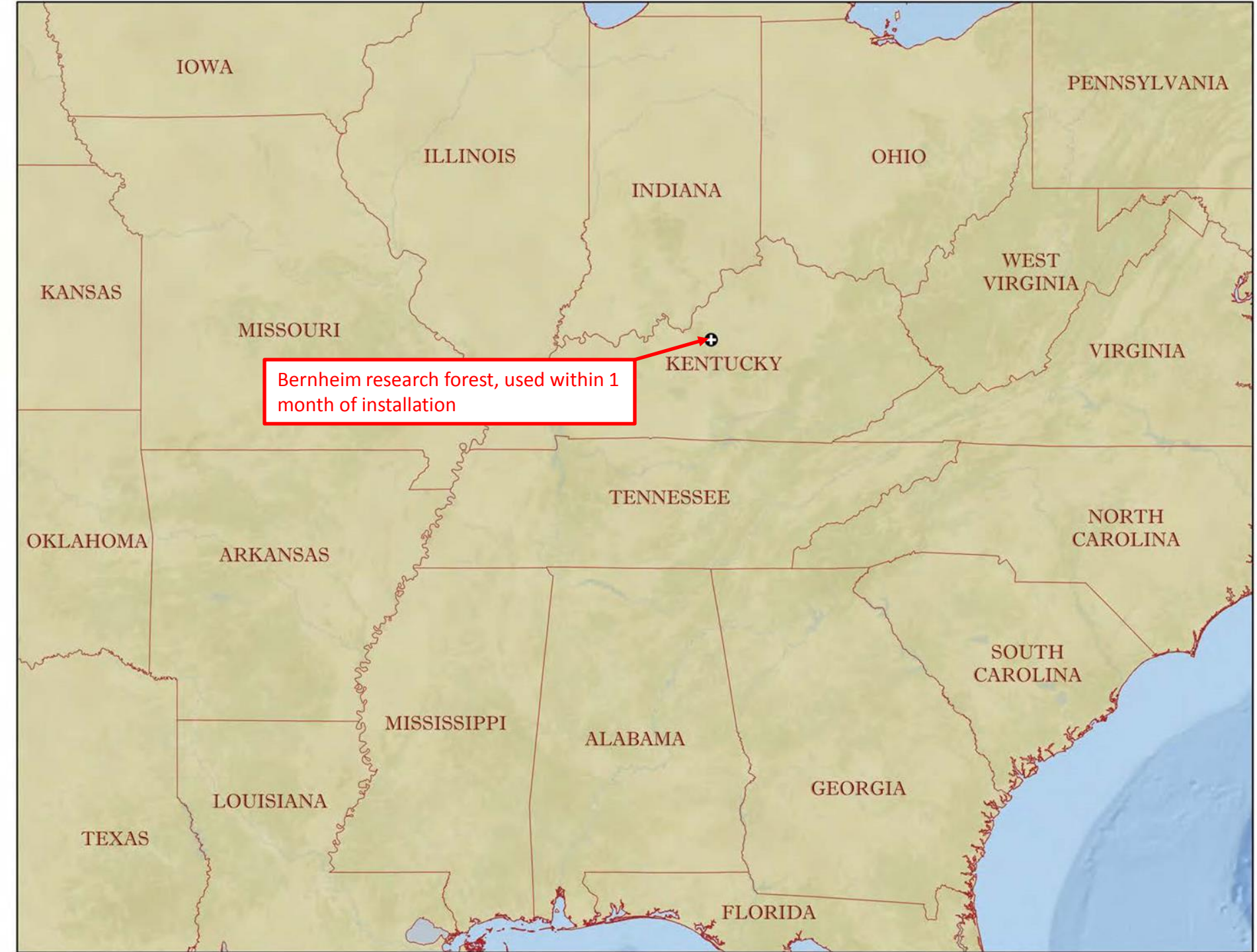
ALABAMA
GEORGIA
LOUISIANA
TEXAS
FLORIDA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Bernheim research forest, used within 1 month of installation
TENNESSEE
NORTH CAROLINA
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ARKANSAS
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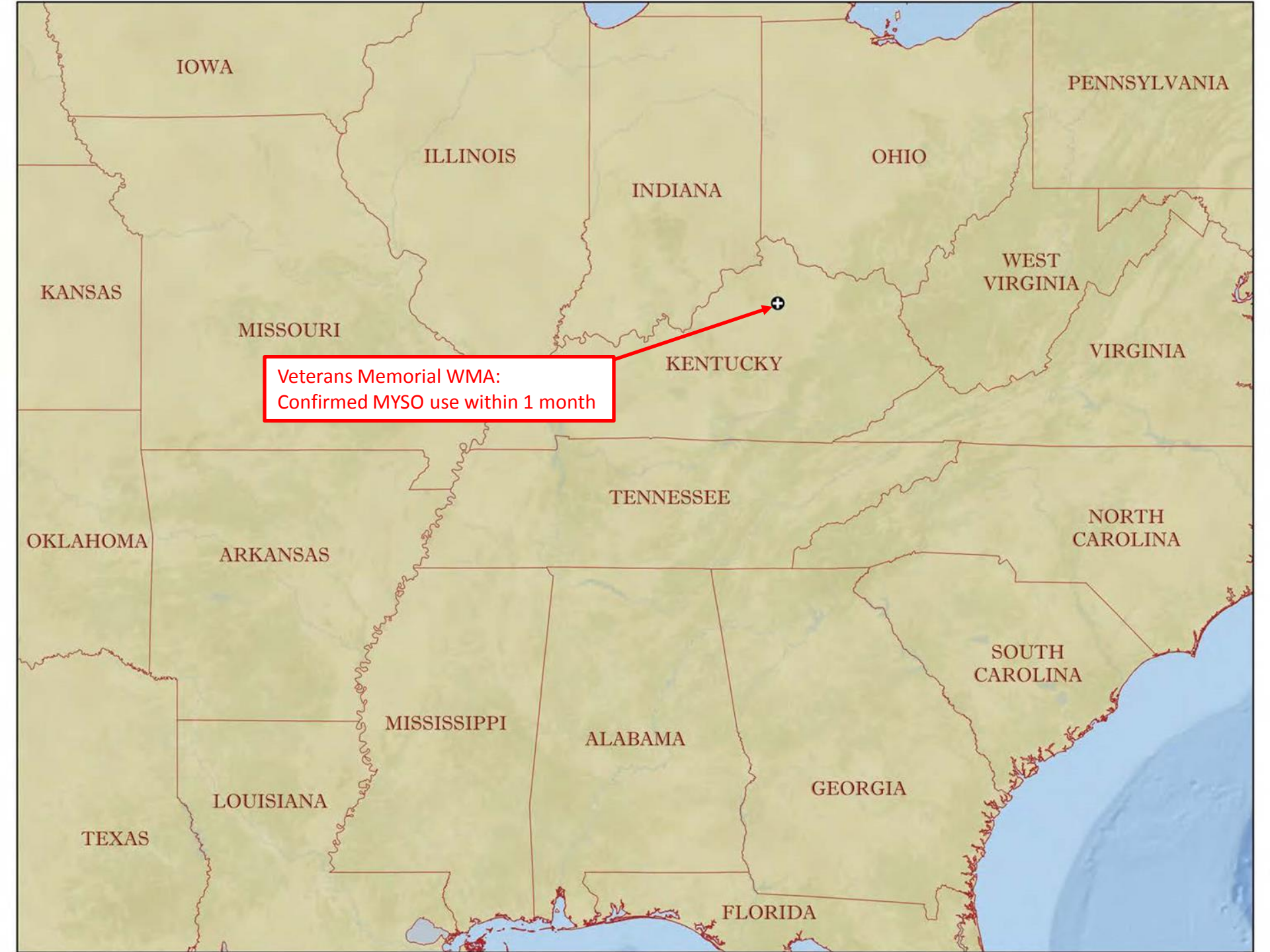
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Veterans Memorial WMA:
Confirmed MYSO use within 1 month
TENNESSEE
NORTH CAROLINA
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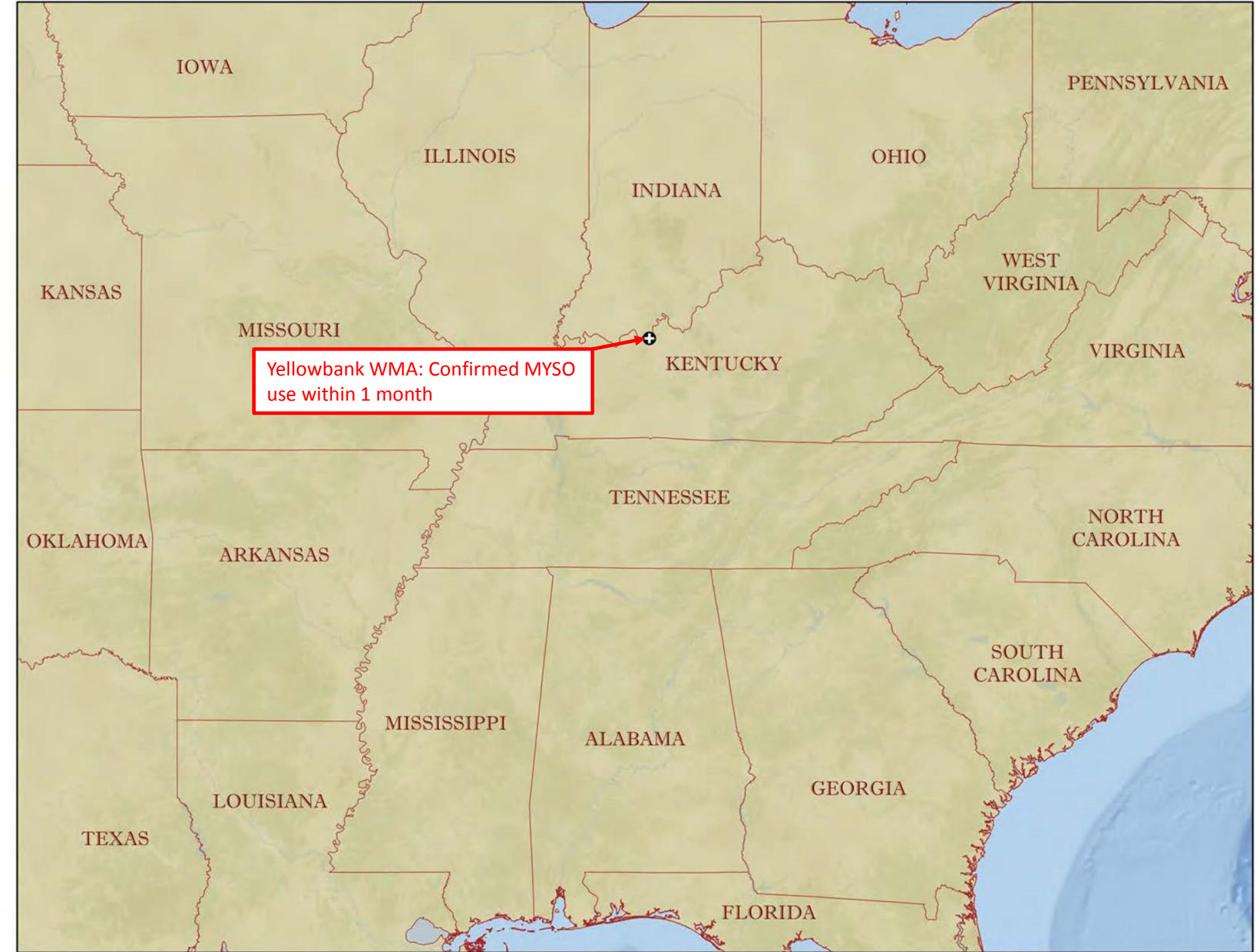
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Yellowbank WMA: Confirmed MYSO use within 1 month
TENNESSEE
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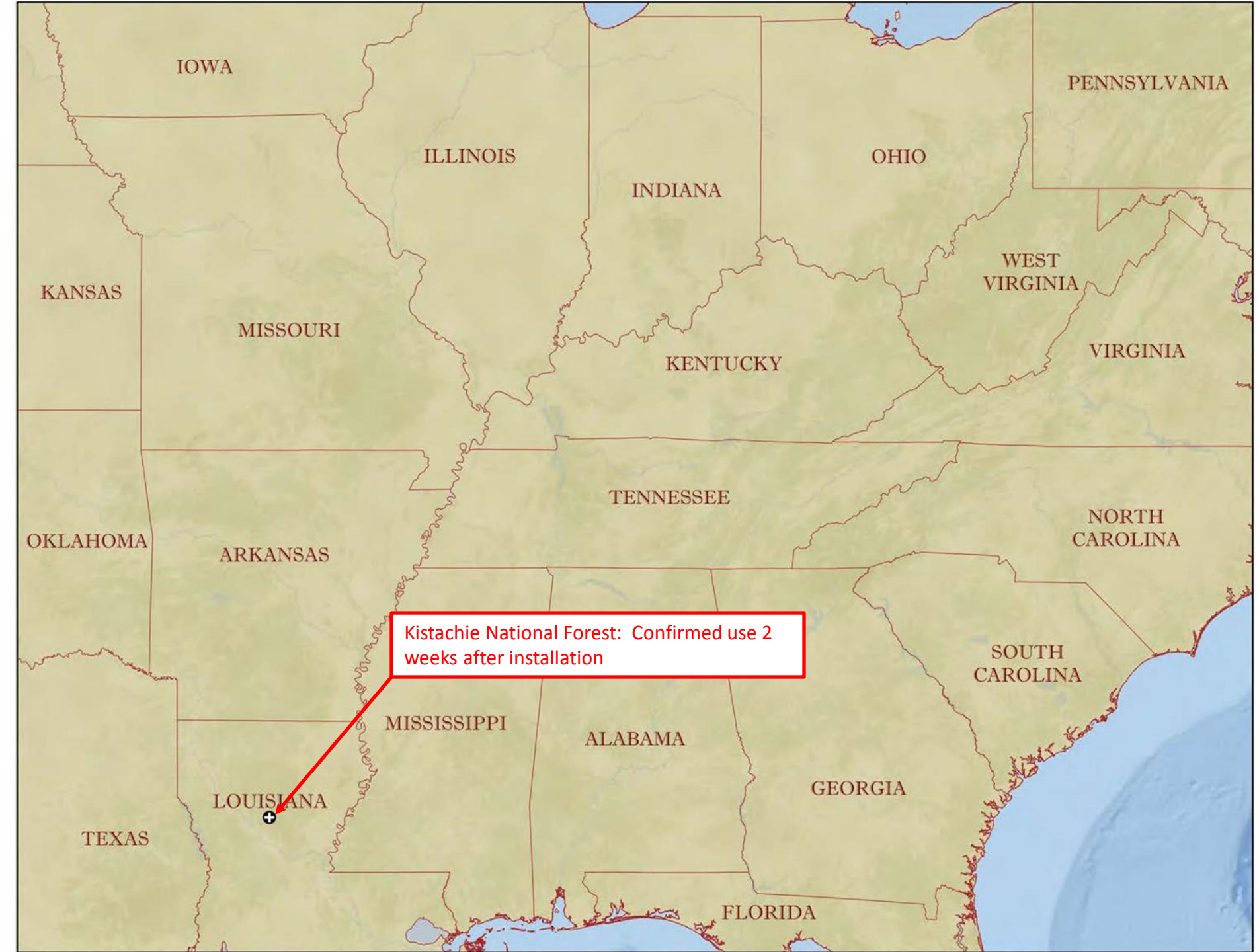
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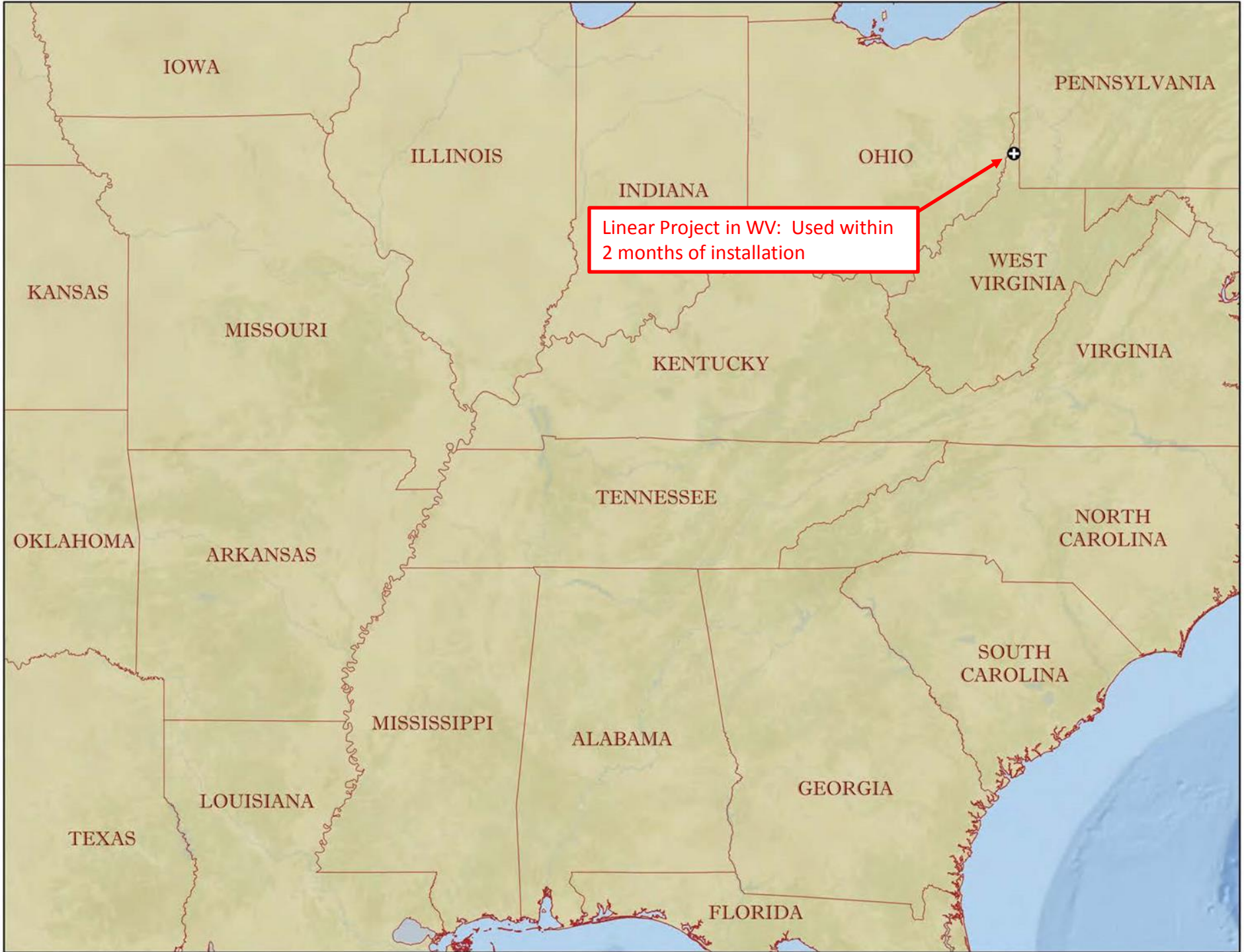
FLORIDA
Kistachie National Forest: Confirmed use 2 weeks after installation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Linear Project in WV: Used within 2 months of installation
KANSAS
MISSOURI
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VIRGINIA
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NORTH CAROLINA
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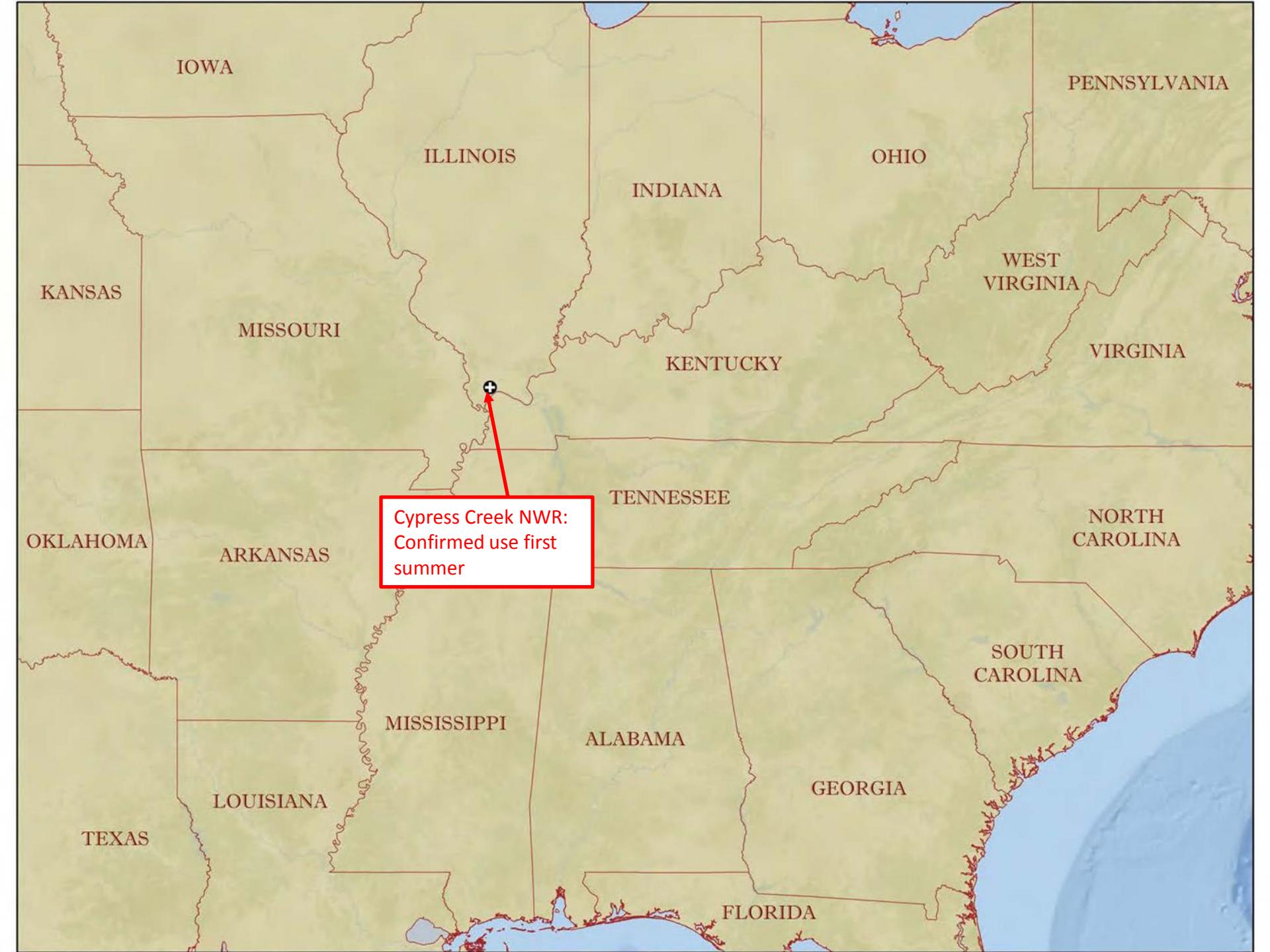
TEXAS
FLORIDA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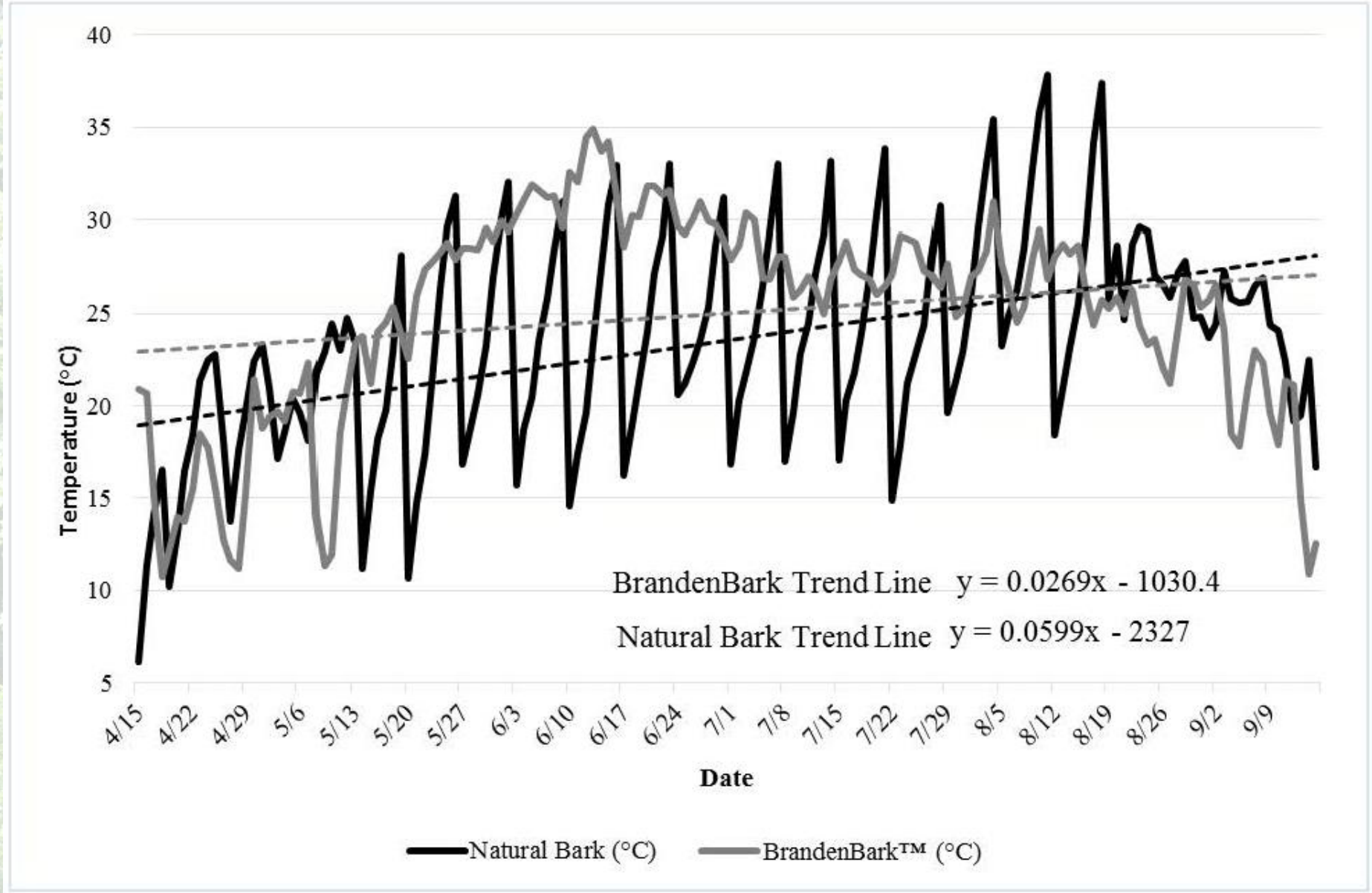
ALABAMA
GEORGIA
LOUISIANA
TEXAS
FLORIDA
Cypress Creek NWR: Confirmed use first summer

Benefits of BrandenBark™

- Provides instant habitat
- Can be made to look like natural snags
- Easy to install
- Choose location
  - Mitigation and habitat enhancement in areas where it is known the habitat will be protected
- Easy to monitor
  - Guano traps
  - Easily netted
- Long lasting
- Provides stable thermal environment


40
35
30
25
20
15
10
5
Temperature (°C)
BrandenBark Trend Line y = 0.0269x - 1030.4
Natural Bark Trend Line y = 0.0599x - 2327
4/15
4/22
4/29
5/6
5/13
5/20
5/27
6/3
6/10
6/17
6/24
7/1
7/8
7/15
7/22
7/29
8/5
8/12
8/19
8/26
9/2
9/9
Date
Natural Bark (°C)
BrandenBark™ (°C)

BrandenBark™ as a Mitigation tool

Local utility assisted with installation and received mitigation credit

Appropriate Mitigation/Enhancement Tool for…

- Transportation projects
- Gas lines
- Wetland and stream restoration
- Impoundment projects
- Electric transmission lines
- Mineral extraction
- Wind resource development
- Land managers
- Any other project where forest impact occurs

Questions

www.copperheadconsulting.com/brandenbark