AMERICAN BURYING BEETLE

Nicrophorus americanus

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ABB OVERVIEW

- Range delineation
- Conservation Priority Areas delineation
- Impact assessment
  - Habitat Exclusions
- Updates to survey protocols
- Banks/mitigation lands

ABB & ESA

- Federally-listed as Endangered in 1989.
- Nocturnal.
- Reproduces underground in the summer (ABB buries small carrion) and spends the winters deeper in the soil.
- ABB habitat occurs through out the eastern 1/3 of Oklahoma and has been documented in 27 counties.

LIFE CYCLE OF ABB

July 23 – Aug 4

Males and Females battle; winning couple takes carcass to bury

ABB emerge
~Day 135
May 15

Breeding pair buries carcass and lays eggs next to it within a couple days

Day 137
May 17

Eggs hatch into larvae in about 4 days

Day 139
May 19

Larvae feed for 6 to 12 days until pupation

Day 141 – 147
May 21 – May 27

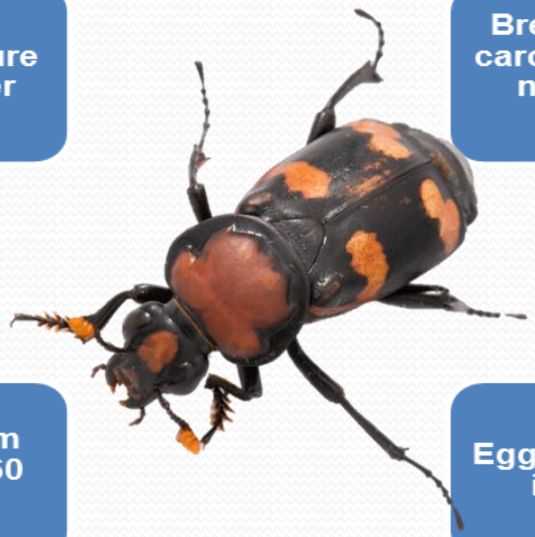
Adults emerge from pupation, in 48 to 60 days

Day 183 – 195
July 2 – July 14

2nd generation

Adults are reproductively mature about 21 days after emergence

Day 204 – 216
July 23 – Aug 4



Day 206 – 218
July 25 – July 27

208 – 220
July 27 – Aug 8

210 – 216
July 29 – August 4

252 – 264
Sept 9 – Sept 21
Overwinter as tenerals until the following spring

273 – 285
Sept 30 – Oct 12

ABB SCIENCE REVIEW

- June 2013 – November 2013
  - With representatives from HQ, RO-2, OK ESFO
- Structured Decision Making using peer reviewed literature*, grey literature *, industry reports *, protected habitat reports and studies *, and theses & dissertations *.
  - We identified:
    - everything we know about ABB,
    - everything we assume we know about ABB
    - things we don't know about ABB
- Developed guidance and protocols based on our findings
- Developed an industry-specific habitat conservation plan

*literature available in our files

ABB RANGE

What was included?

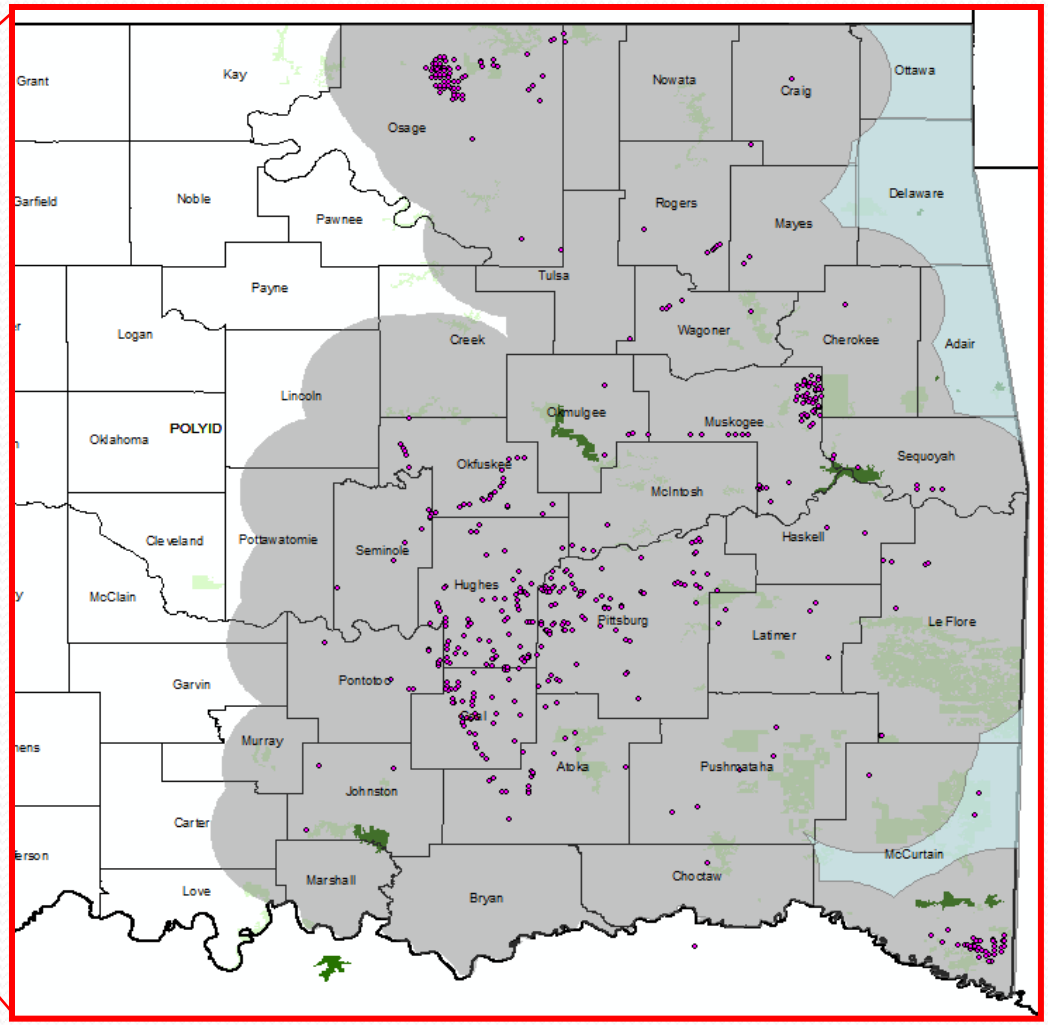


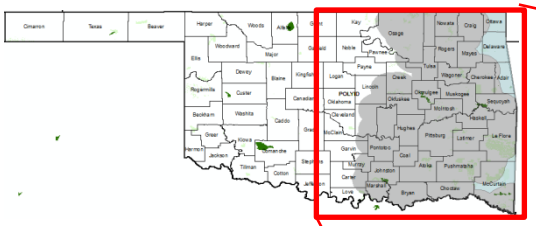
ABB RANGE DELINEATED

- Areas within 29.19 km (18.14 miles) (maximum ABB movement recorded by Jurzenski et al. 2011) of all documented ABB occurrences; AND
- Portions of counties on the eastern border of Oklahoma that are not within 30-km of a documented ABB occurrence are regarded as potential ABB range, due to the potential for ABB habitat in these areas and previously documented ABB locations in adjacent states.

  …Accordingly…

- This includes counties with positive occurrences and counties bordering another county with known ABB occurrence, *except on the western border*.

ABB RANGE



On the Western edge of the range, the range only includes the portion of those counties that are located within 30 km (18.14 miles) of an ABB occurrence (Jurzenski et al. 2011).

Areas on the eastern edge are included in the range due to information from across the border.

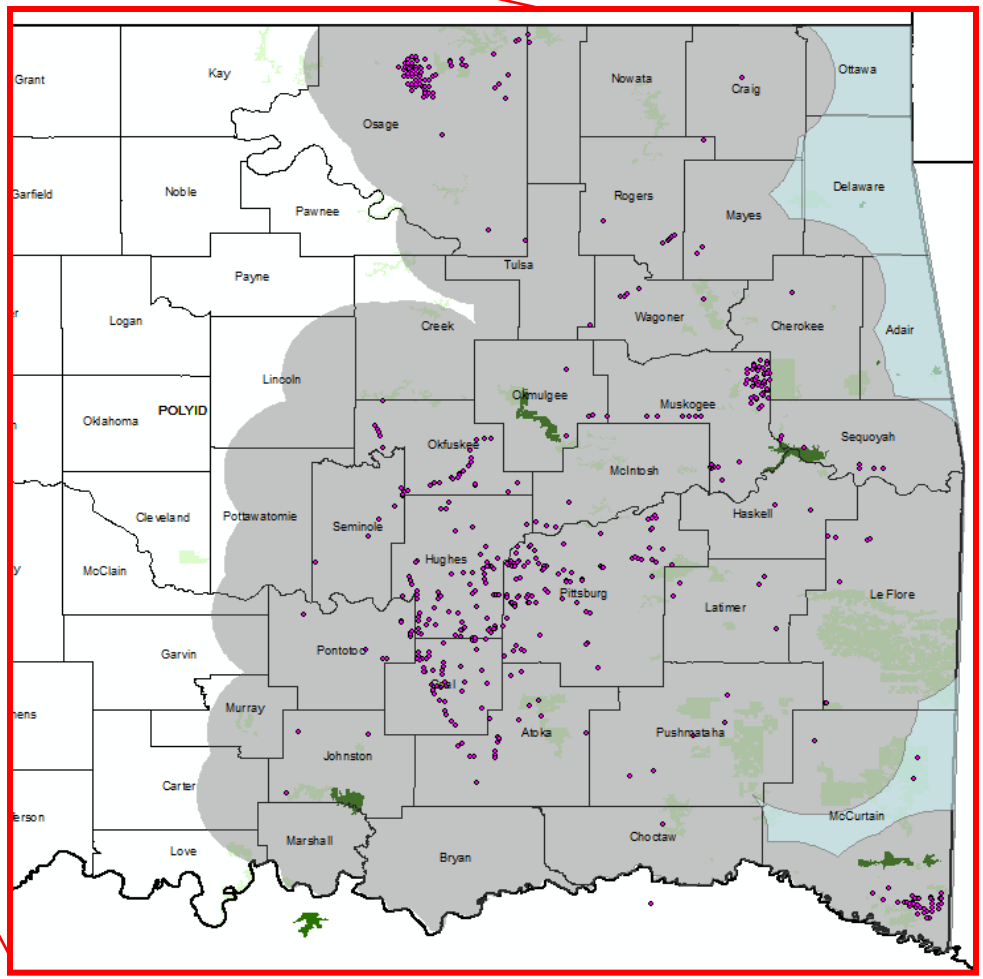


ABB RANGE DELINEATED

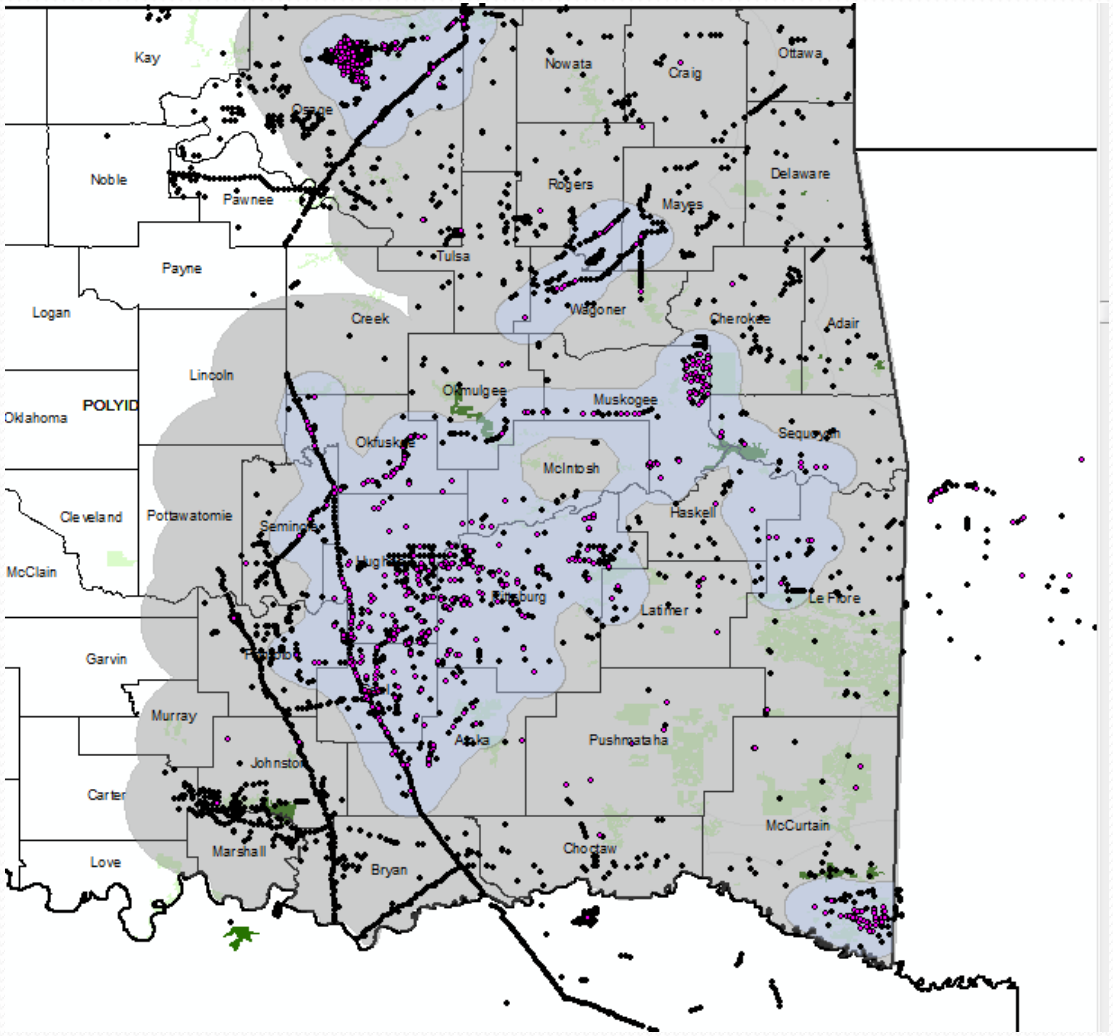
- 27 Counties:

Adair, Atoka, Bryan, Carter, Cherokee, Choctaw, Coal, Craig, Creek, Delaware, Garvin, Haskell, Hughes, Johnston, Kay, Latimer, Le Flore, Lincoln, Love, Marshall, Mayes, McClain, McCurtain, McIntosh, Murray, Muskogee, Nowata, Okfuskee, Okmulgee, Osage, Ottawa, Pawnee, Payne, Pittsburg, Pontotoc, Pottawatomie, Pushmataha, Rogers, Seminole, Sequoyah, Tulsa, Wagoner, and Washington.

- If a project is located within any of these 27 counties, the project proponent should consider impacts to ABB.

- The Service expects offsets for any impacts to occupied habitat in furtherance of ABB conservation and recovery.

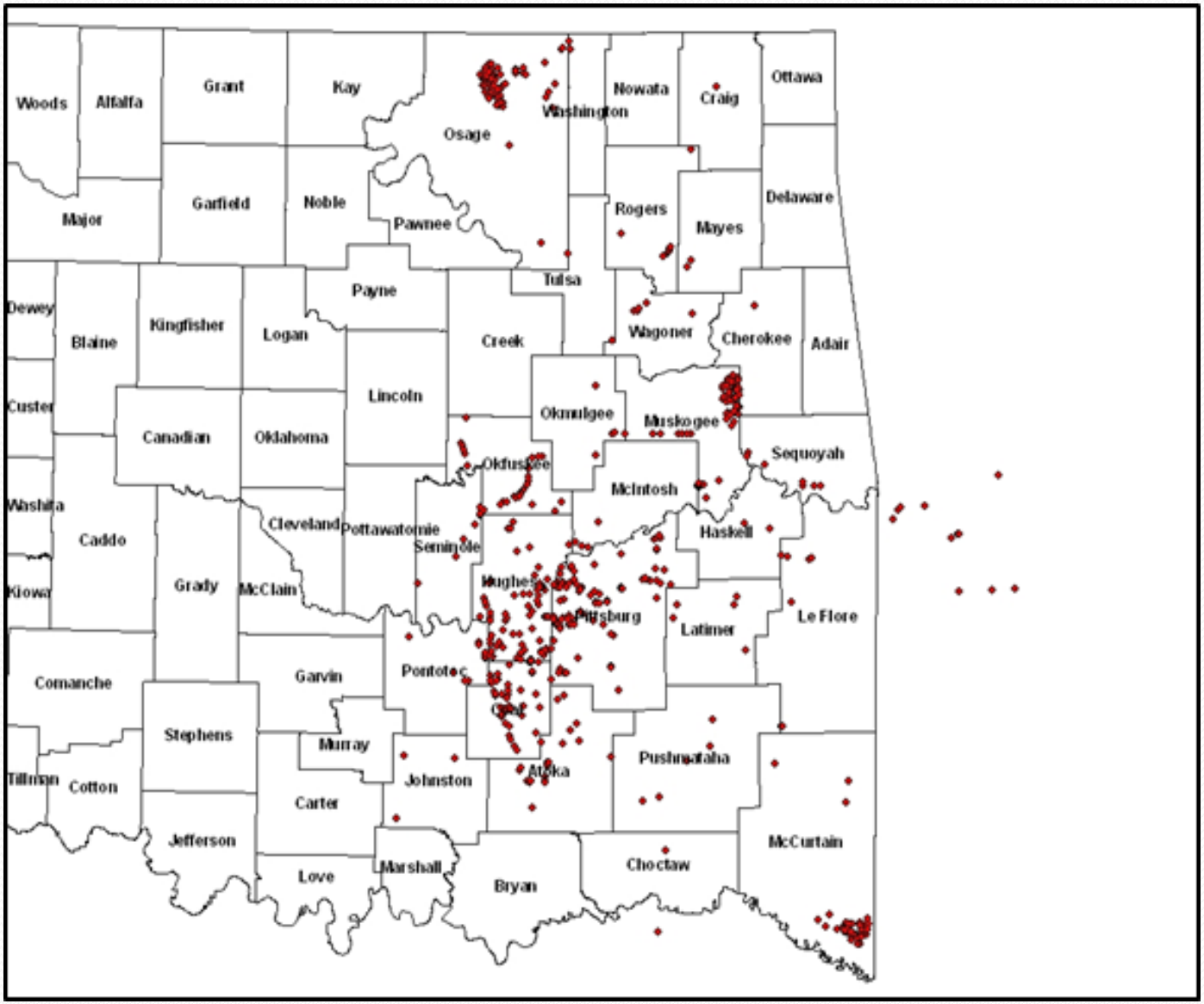
DELINEATION OF CONSERVATION PRIORITY AREAS



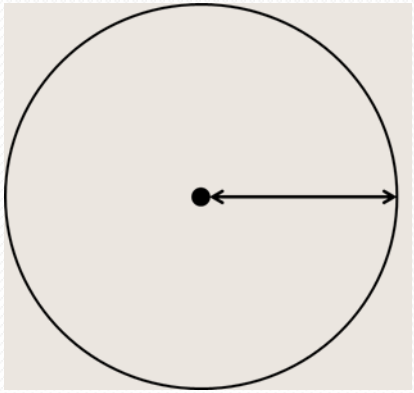
- Using presence - absence surveys, we selected all ABB surveys conducted in the last ~10 years.

DELINEATION OF CPAS

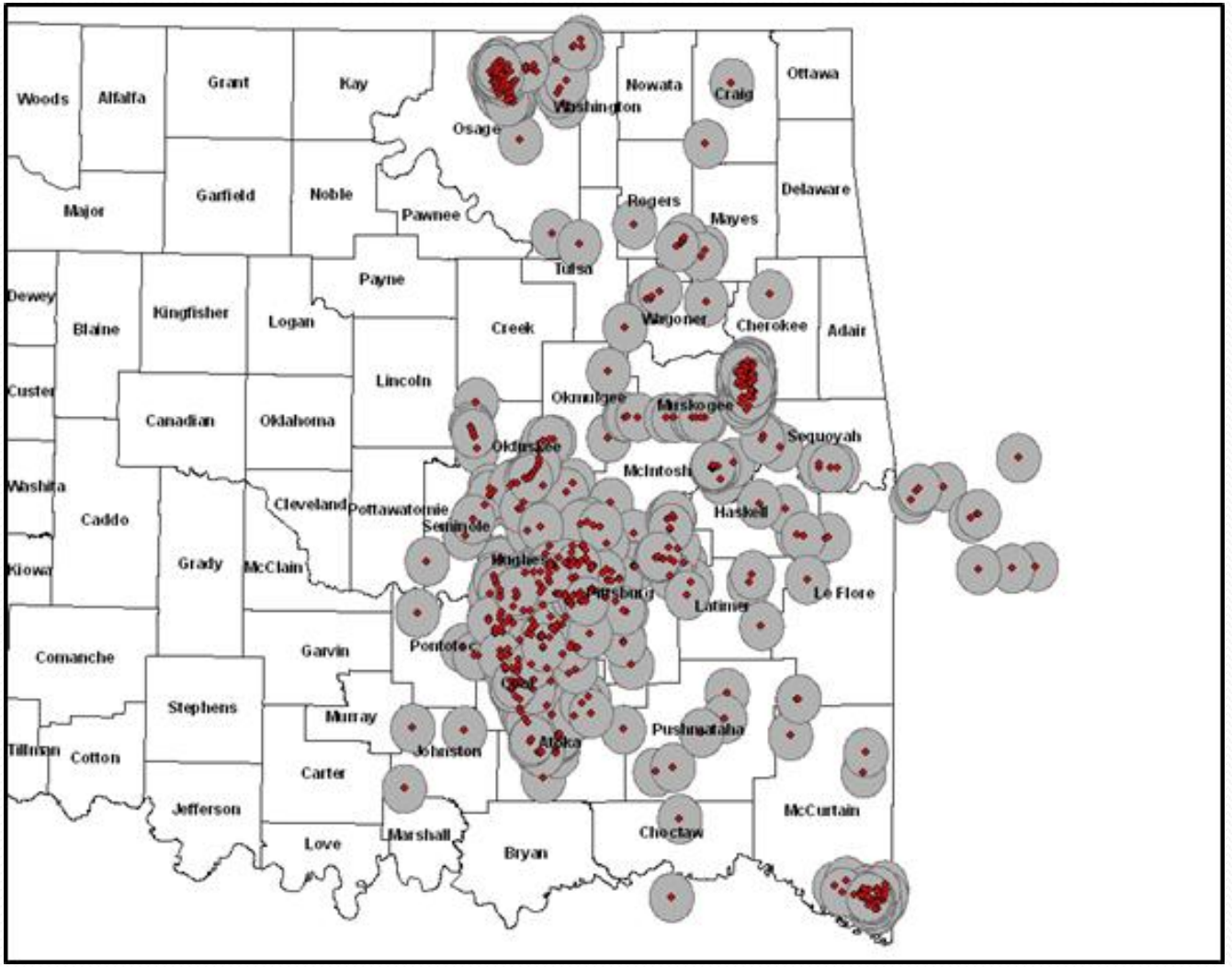
- Of these surveys, we selected only surveys where ABBs were identified (positive surveys



DELINEATION OF CPAS

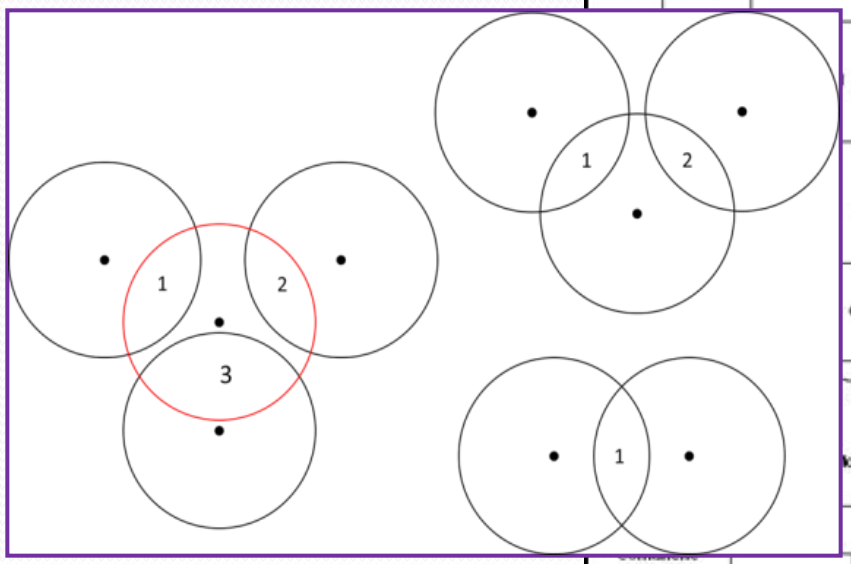


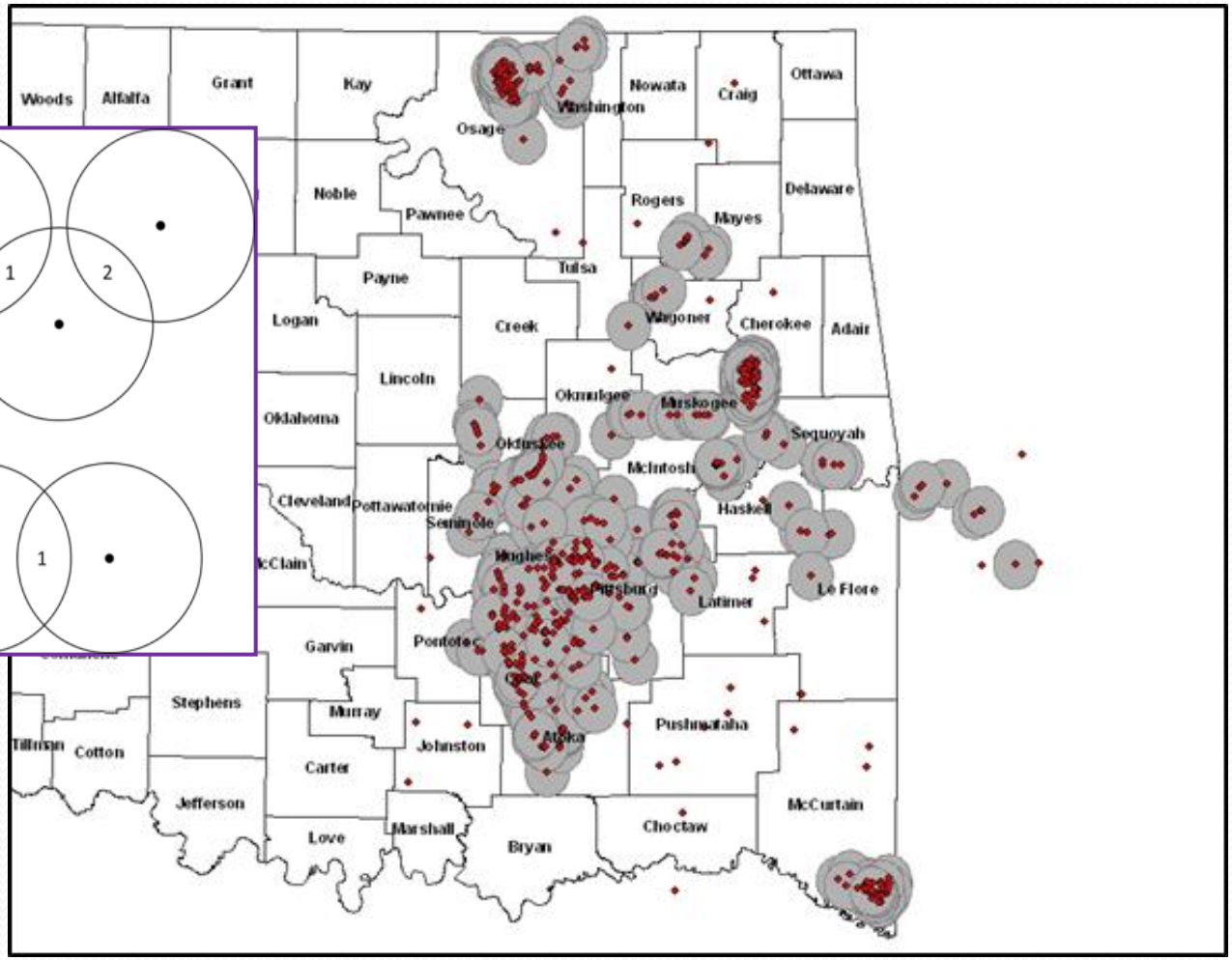
- We created a 10 km radius (buffer) around each positive survey point, based on the maximum distance for an ABB recaptured in Oklahoma (movement over 6 nights -Creighton and Schnell 1998).



DELINEATION OF CPAS

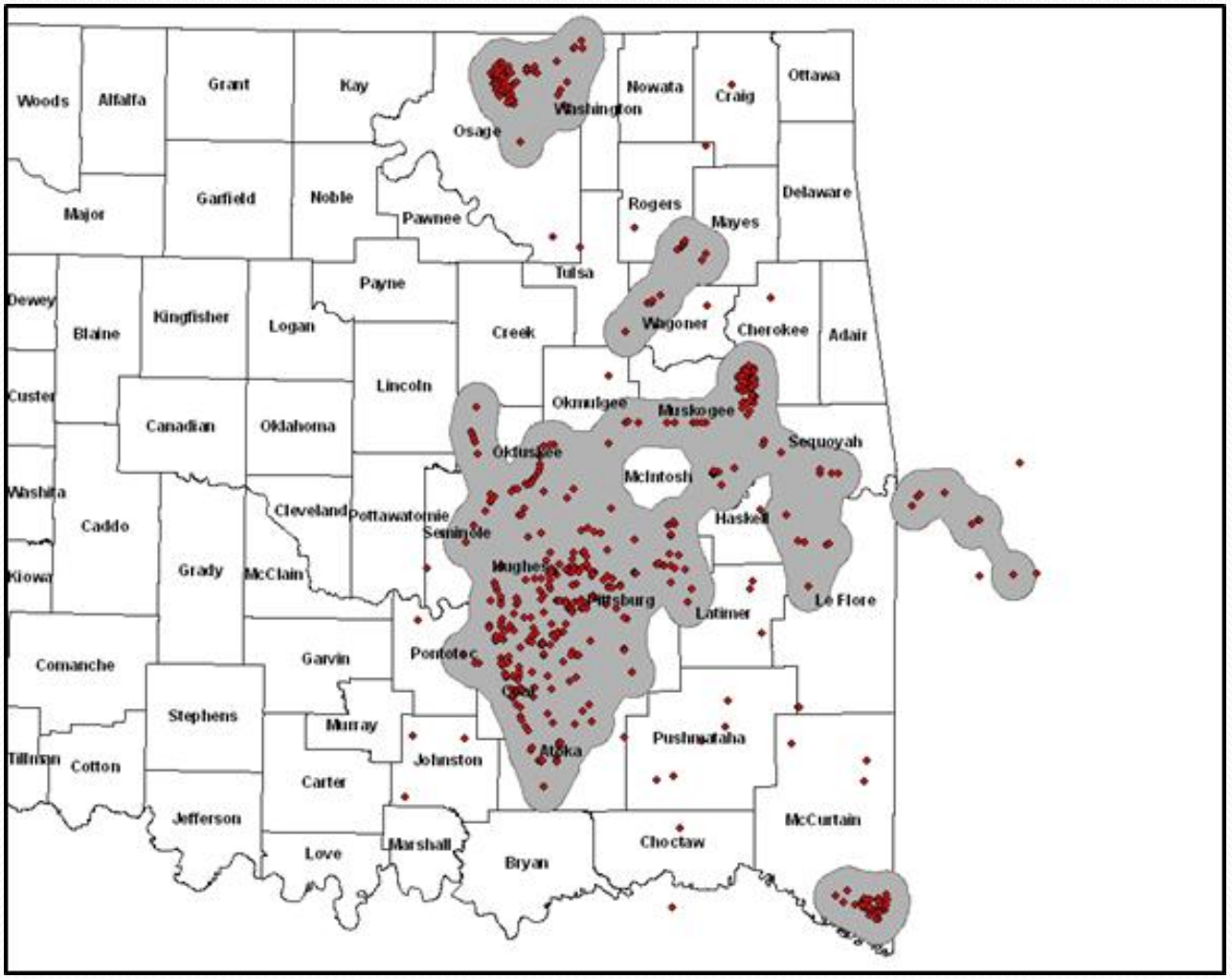
We then identified and selected all buffers that intersected a minimum of 3 other buffers. This was done to limit outlying positive surveys and to focus CPAs in areas with potentially higher ABB concentrations





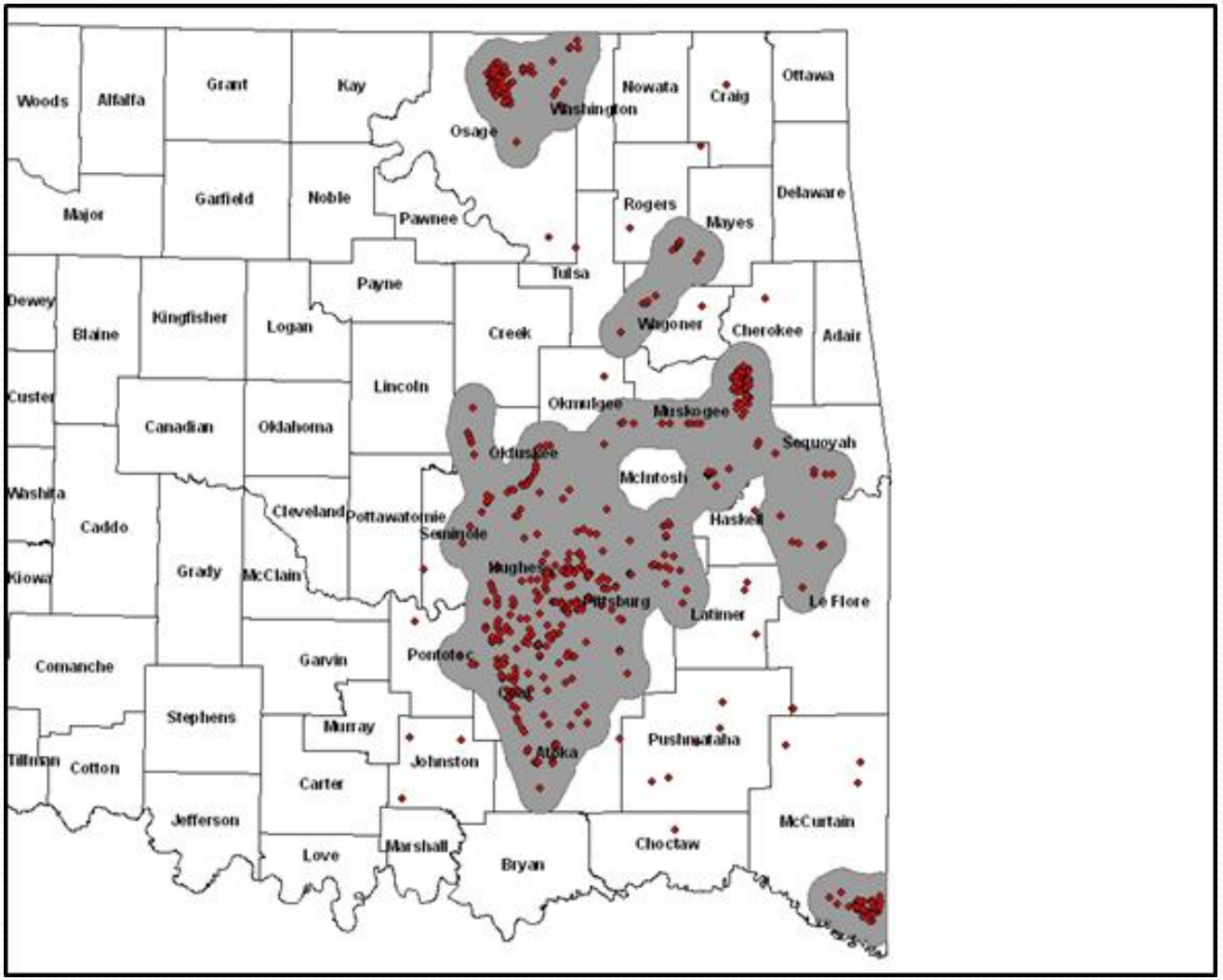
DELINEATION OF CPAS

- We combined the selected buffers within 10 km of each other into new polygons using the aggregate polygon tool in ArcMap



DELINEATION OF CPAS

- We selected only the areas within Oklahoma



DELINEATION OF CONSERVATION PRIORITY AREAS

- CPA were developed using only positive occurrences from all sources
- Buffered each point with 10 km (Creighton and Schnell 1998)
- Selected those intersecting 3 or more others
- Aggregated those using ArcMap
- Limited to only OK

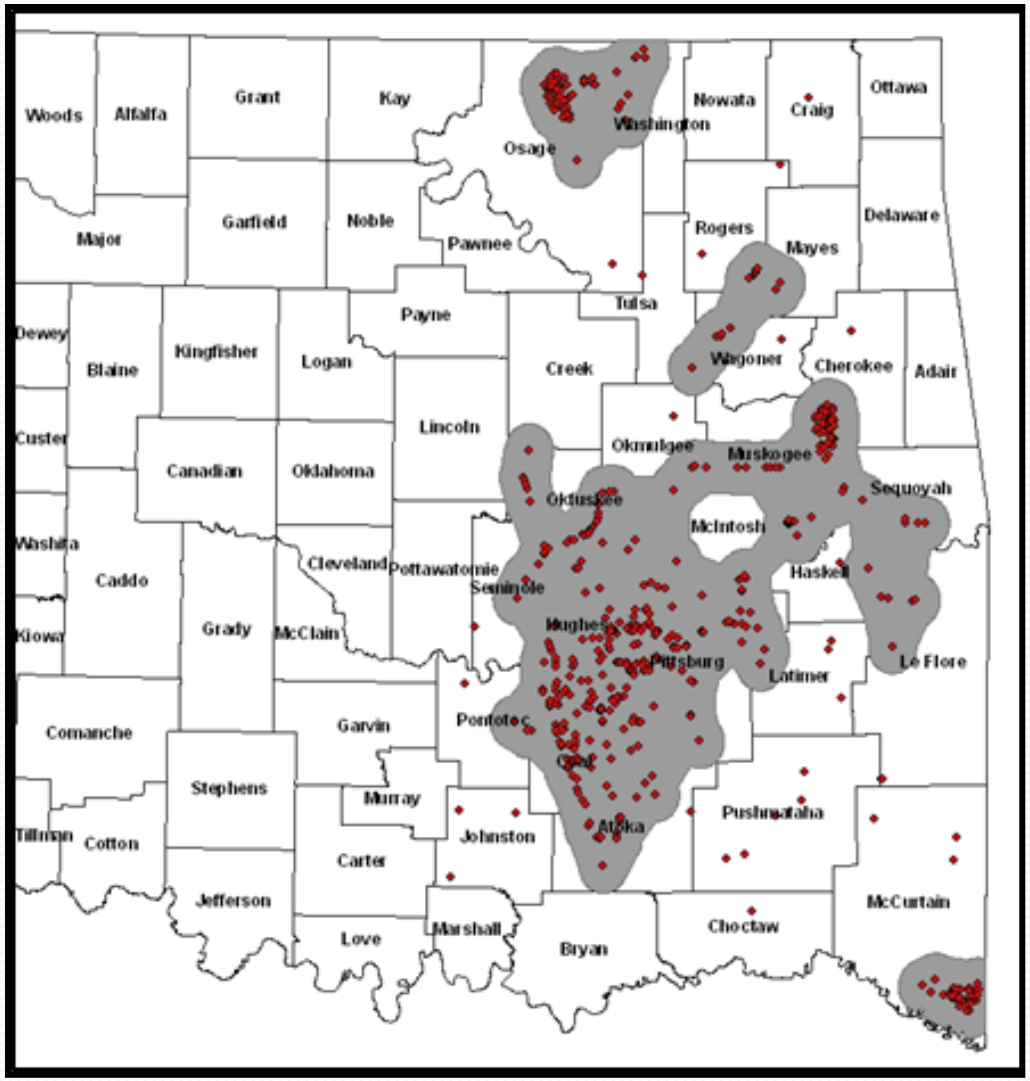
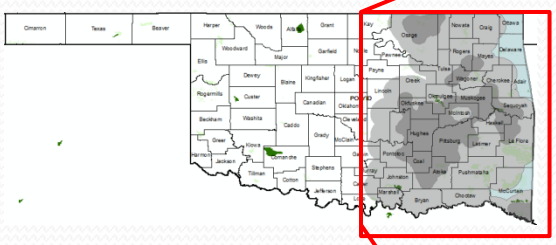


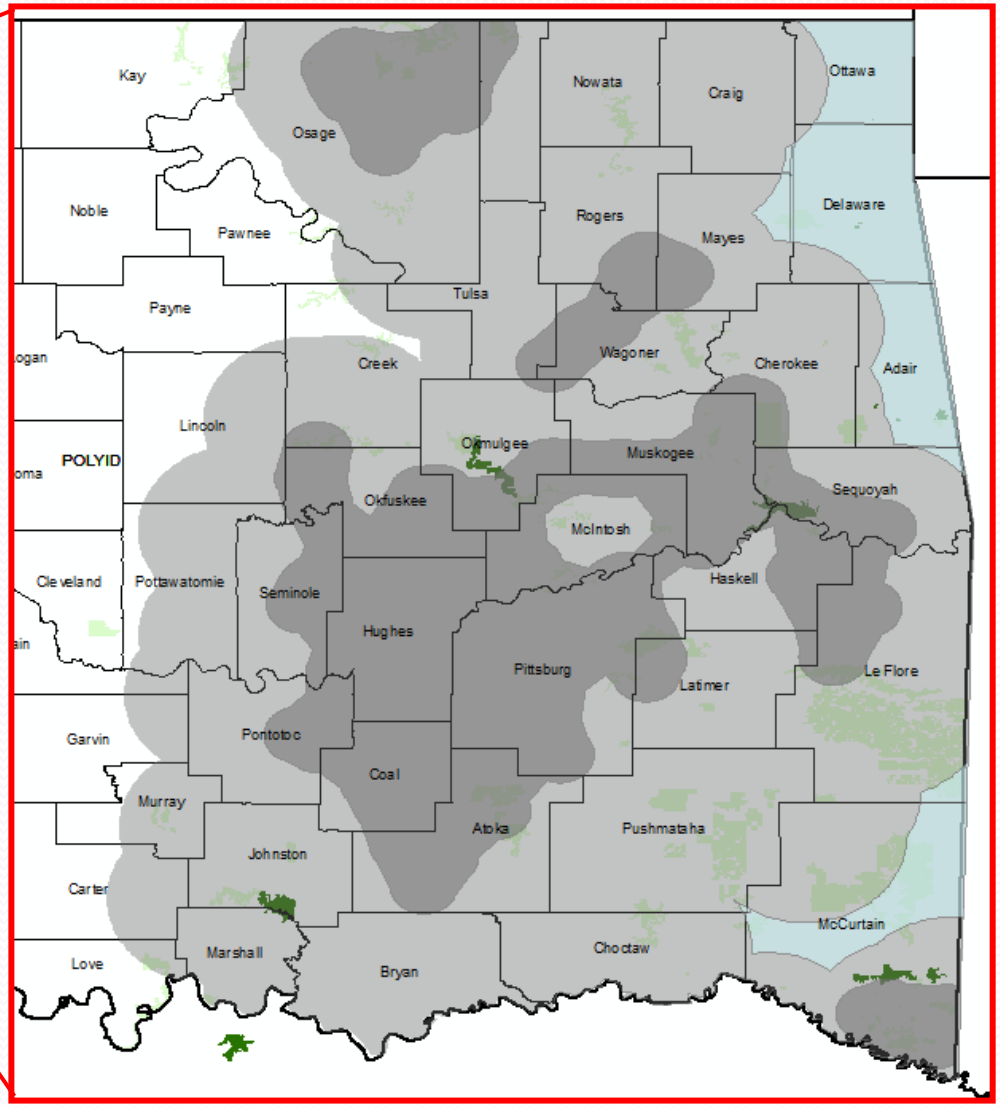
ABB RANGE AND CPA



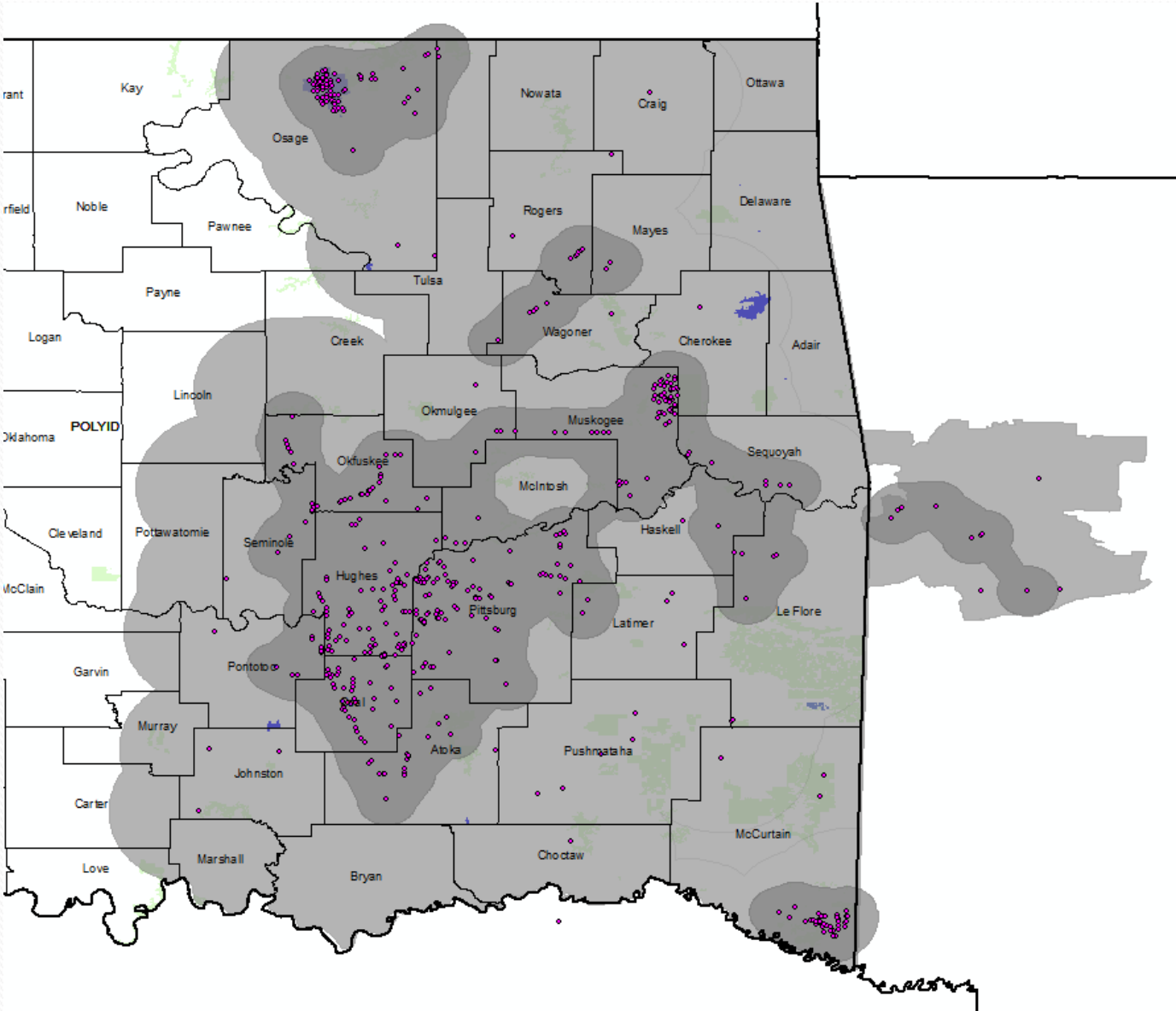
*Blue indicates potential range

*Light grey indicates Oklahoma range

*Dark grey indicates CPA



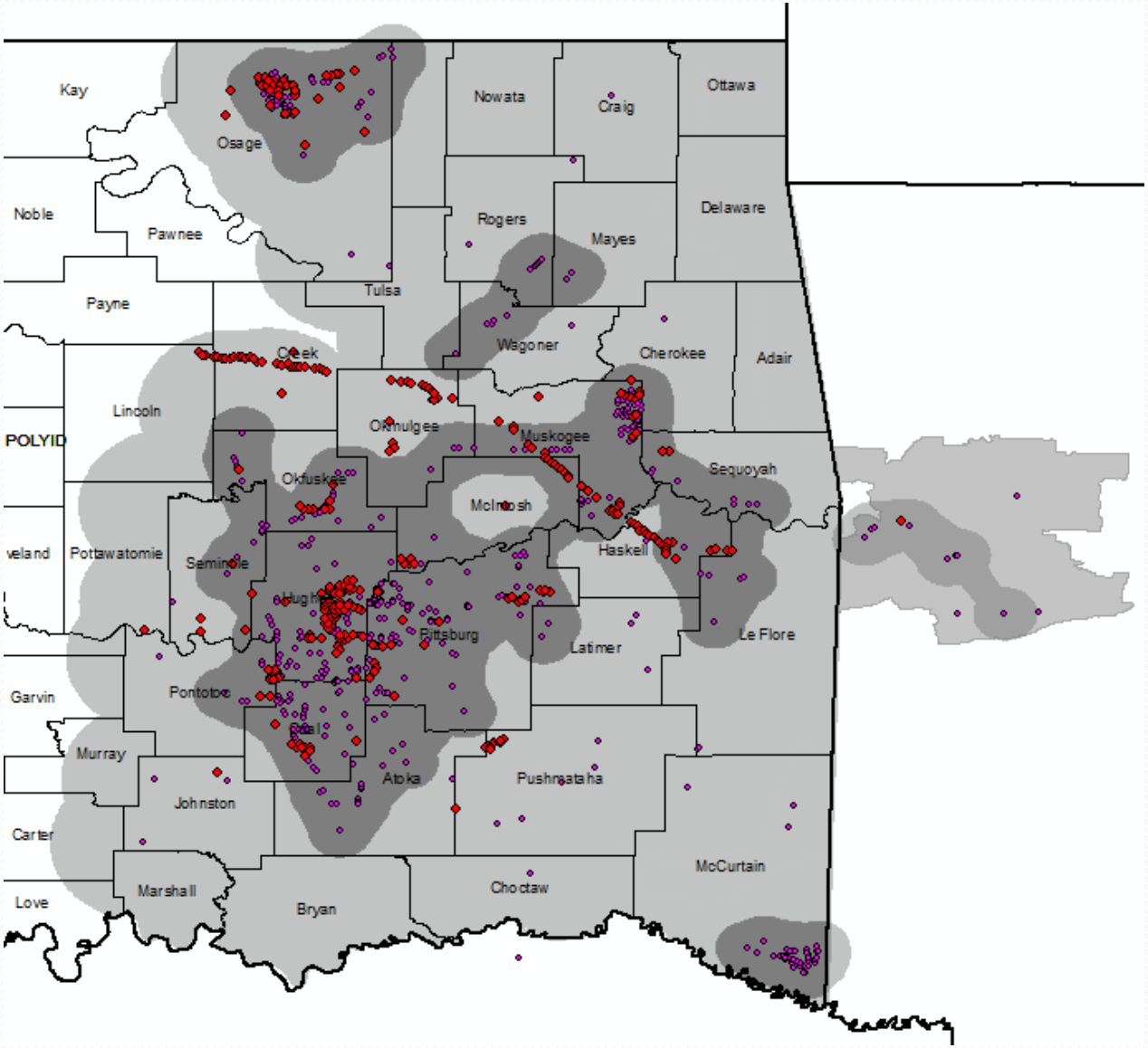
2003-2013 Distribution



Current Distribution

Red = 2014

Purple = ~ last 10 years or so



Areas Unfavorable for ABB

- Land that is tilled on a regular basis, planted in monoculture, and does not contain native vegetation (Ag fields.)

- Pastures or grasslands that have been maintained through frequent mowing, grazing, or herbicide application at a height of 20 cm (8 inches) or less. (Demonstrated by at least a year of previously being maintained in this manner and containing the previous ABB active season.)*

- *We suspect some project proponents go to extraordinary measures to meet these criteria, [redacted].

Continued on next page →

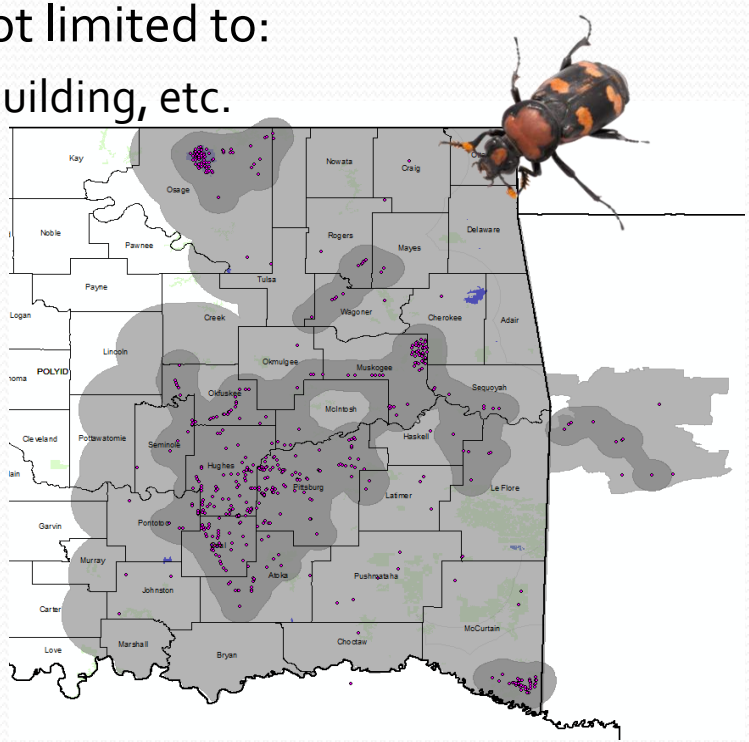
Areas Unfavorable for ABB

- Land that has already been developed and no longer exhibits topsoil, leaf litter, or vegetation.
- Urban areas with maintained lawns, paved surfaces, or roadways.
- Stockpiled soil without vegetation.
- Wetlands with standing water or saturated soils (defined as sites exhibiting hydric-soils, and vegetation typical of saturated soils, and/or wetland hydrology).

- NOTE: Areas **adjacent to wetlands and/or riparian areas** may be used by the ABB therefore **are considered favorable habitat for the ABB**. These areas may be important for ABBs seeking moist soils during dry conditions.

WHEN IS A SURVEY NEEDED IN OKLAHOMA?

- Soil disturbance of suitable ABB habitat from any source inside ABB range.
  - There is no minimum threshold for soil disturbance*
  - Examples of impacts types include but not limited to:
    - road building, well pads, pipelines, home building, etc.
    - Vegetation alterations
      - land clearing, tree removal, Rx fire, etc.



- Option to assume presence
  - inactive season or short timelines

*our position is that this is something that the project proponent should tell the Service.

SURVEY PROTOCOL UPDATE

- Duration – 5 nights*
- No calendar date for beginning or ending of active season surveys
  - 5 consecutive nights above 60 – begins
  - First night in September below 60 - ends
- **July 28** requires a new survey for inactive season construction
- No validation letters to surveyors
- 1.2-acre threshold removed
- Bait-away – gone
- Trap and relocation – OSU study ongoing.

* I understand this has been a source of contention for quite some time. [redacted]

[redacted]

Questions

CONSERVATION BANKING

American Burying Beetle

Nicrophorus americanus

CONSERVATION BANKS & MITIGATION LANDS

- Relationship to Recovery

  - Conservation banks and mitigation lands are areas dedicated to species management. These areas will be permanently protected by a conservation easement, long-term management plan, and a perpetual endowment for the management of the property in perpetuity. This will help to demonstrate secure populations for recovery and ultimately provide support for any status reviews or future delisting.

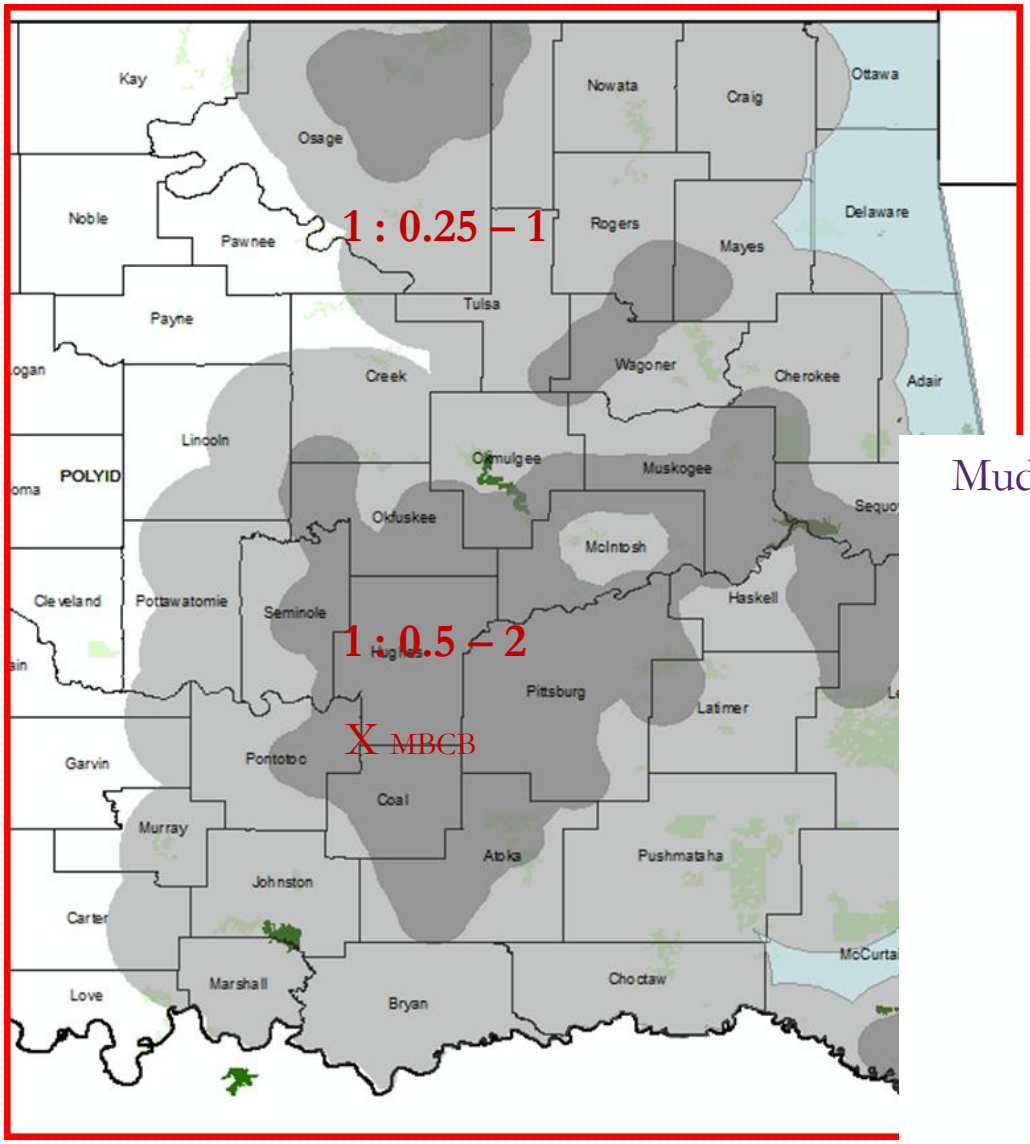
COMPENSATORY MITIGATION RATIOS

Areas where impacts may result in a greater magnitude of take, and thus a larger effect on ABB, have higher mitigation ratios. Greater duration of impacts likely result in greater adverse impacts to the ABB. Mitigation ratios start at 1:0.25 for temporary impacts and increase as duration of impacts increase or are located within mitigation lands.

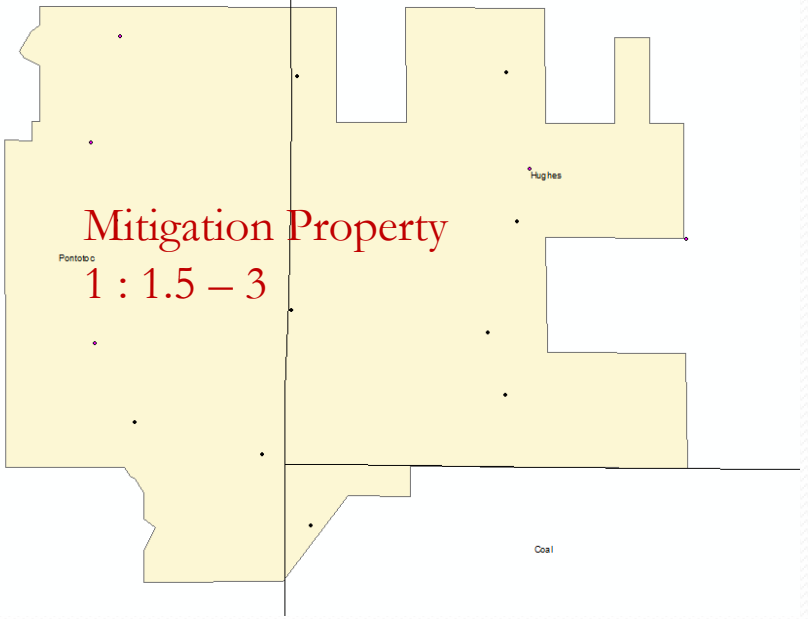
Table 1. Mitigation Ratios for ABB impacts. Ratio = acres of impact : acres of offset

	Location of impact		
Impact Duration	ABB Range (but not within CPA)	Conservation Priority Area (CPA)	Mitigation Land
Temporary	1:0.25	1:0.5	1:1.5*
Permanent Cover Change	1:0.5	1:1	1:2*
Permanent	1:1	1:2	1:3*
*Mitigation Land ratio= CPA ratio plus replacement of lost mitigation value.			

Mitigation Ratios



Muddy Boggy Conservation Bank - 2900 acres



Muddy Boggy Conservation Bank

http://msusa.com/video/

We Market and Sell Environmental Credits
Wetland • Stream • Species

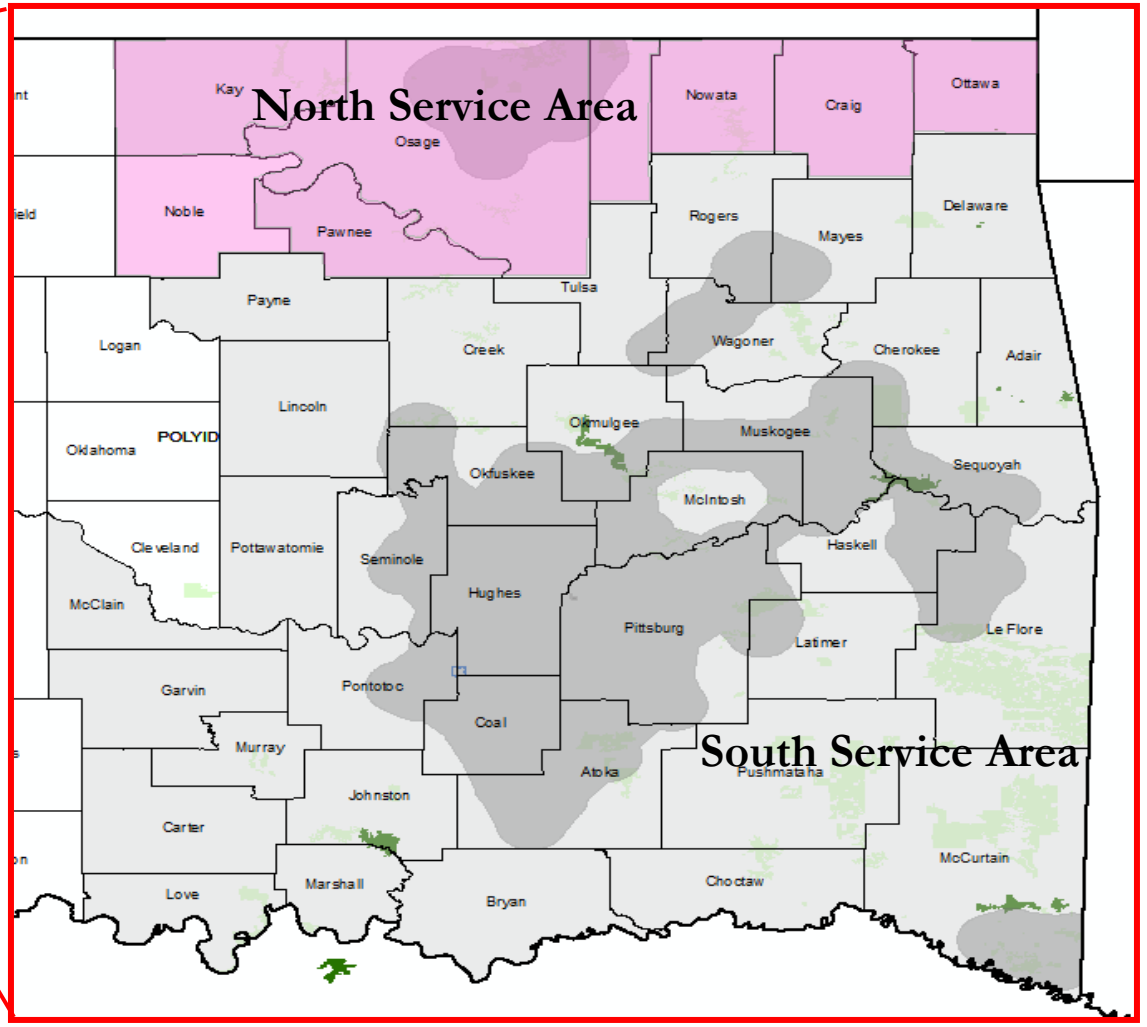
COMPENSATORY MITIGATION

- Compensatory mitigation includes
  - Permittee-responsible mitigation
    - Proponent develop lands
  - 3rd Party mitigation (or single user bank)
    - Proponent hires someone else to develop & manage lands
  - Banking option
    - Proponent purchases conservation credits from an established conservation bank

REQUIREMENTS FOR ALL MITIGATION LANDS

- Location
  - Projects impacting ABB that are located within Oklahoma will be mitigated at any bank within the Service Area where impacts occur.
  - If a bank with available credits is not available in the Service Area where impacts occur, then impacts may be mitigated in the other Service Area at any bank therein.
  - Other mitigation lands should be located within the Service Area where impacts occur.

SERVICE AREAS



REQUIREMENTS FOR ALL MITIGATION LANDS

- Acquisition of suitable habitat
  - Minimum 500* acres for a stand-alone property
- All activities must be planned, funded, and executed in perpetuity
- Banks have done all of this and the costs are figured into their price of a Credit.

*[redacted]

DEVELOPMENT OF CONSERVATION BANKS

- Is it right for you?
- What to consider?
  - Project proponent control the price of Credits in your Bank
  - Could provide a revenue source for the Bank Sponsor and/or Land-owner
  - Provides for a management endowment in perpetuity
  - Endowment could be funded through Credit sales
  - Protects species' habitat in perpetuity
  - Helps recover the species
  - *Hunting is a compatible use within ABB habitat, among other recreation activities. As long as it doesn't impact Conservation values*

Questions