

AMERICAN BURYING BEETLE SURVEY

**Tribal Development Project
Hereford Road
McAlester, Pittsburg County, OK**

Prepared for:



**Choctaw Nation
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Durant, OK 74702**

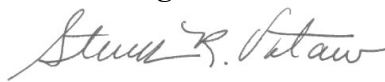
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August 2019



**Steven R. Votaw
President**

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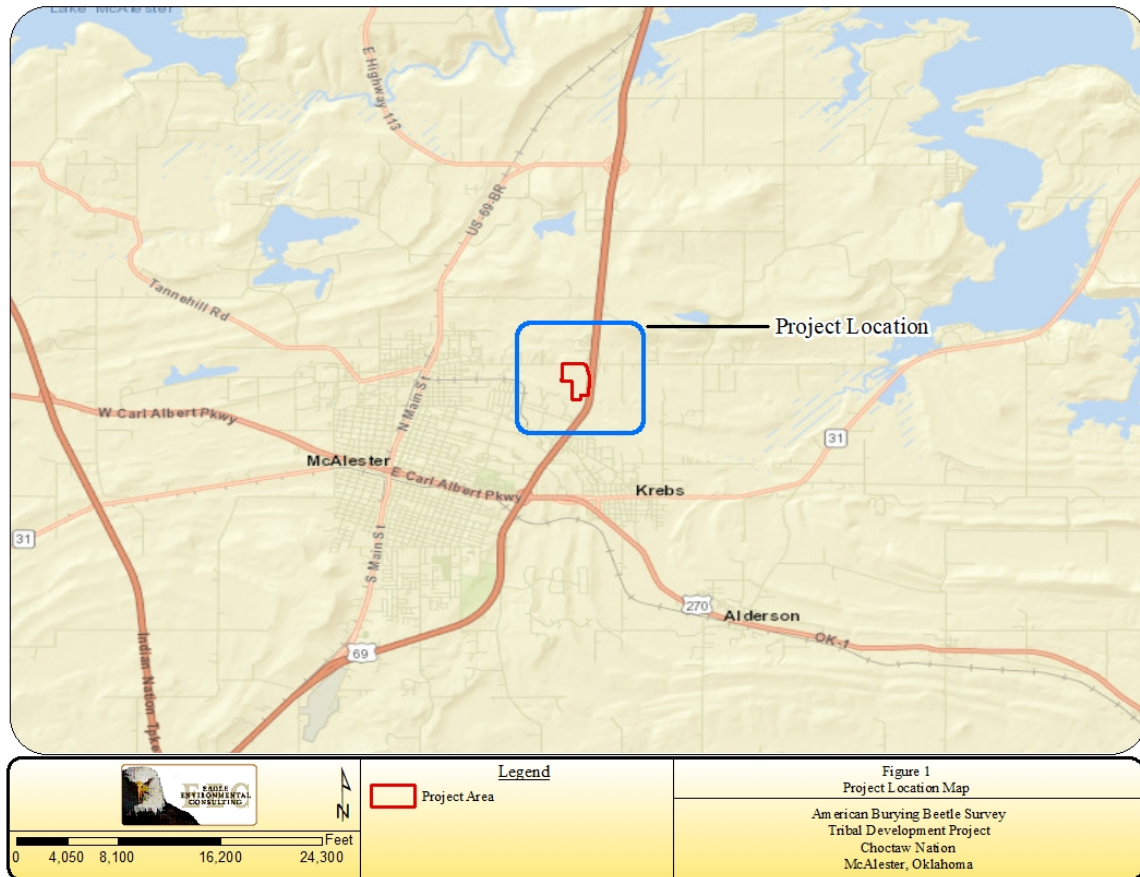
AMERICAN BURYING BEETLE SURVEY

Tribal Development Project McAlester, Pittsburg County, OK

I. Introduction

The subject survey effort was conducted to identify the presence or absence of American Burying Beetles (*Nicrophorus americanus*) (ABB) associated with a proposed Tribal development project on approximately 80 acres of property owned by the Choctaw Nation near McAlester, Oklahoma. The proposed project location is shown on (**Figure 1**).

The survey began August 24th and continued until the morning of August 29th, 2019, during which no ABBs were captured. One trap transect was deployed and maintained for 5 nights and is shown on **Figure 2**. No additional trap nights were required. The ABB has been a federally listed endangered species since 1989 and is also recognized as endangered at the State level. Based on the potential for impact to individuals of ABB, these surveys were performed in compliance with the Endangered Species Act of 1973 (16 U.S.C. 1539, et seq.) and the U.S. Fish and Wildlife Service Regulations (50 C.F.R. 17.22) under Endangered Species permit number TE043399-0.



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II. General Site Description

The survey area is located within the Lower Canadian Hills ecoregion is an irregular to undulating plain that is underlain by interbedded, westward-dipping sandstone, shale, and limestone. (Woods, et.al, 2005). The majority of the lands within this ecoregion are covered by natural vegetation is mostly oak, hickory, and pine trees with tall grass prairie intermixed. Riparian zones are dominated by sycamore, river birch, ash, persimmon, and willow trees. The project area open field and forested areas.

III. Sampling Methodology

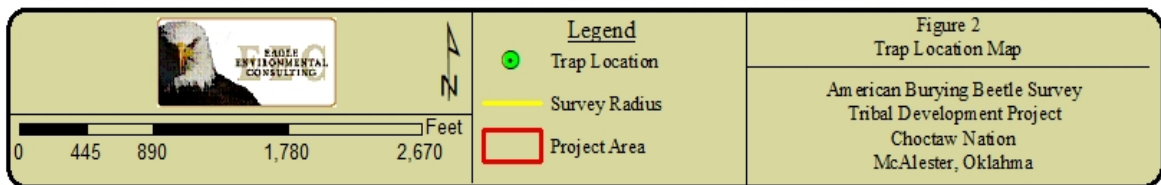
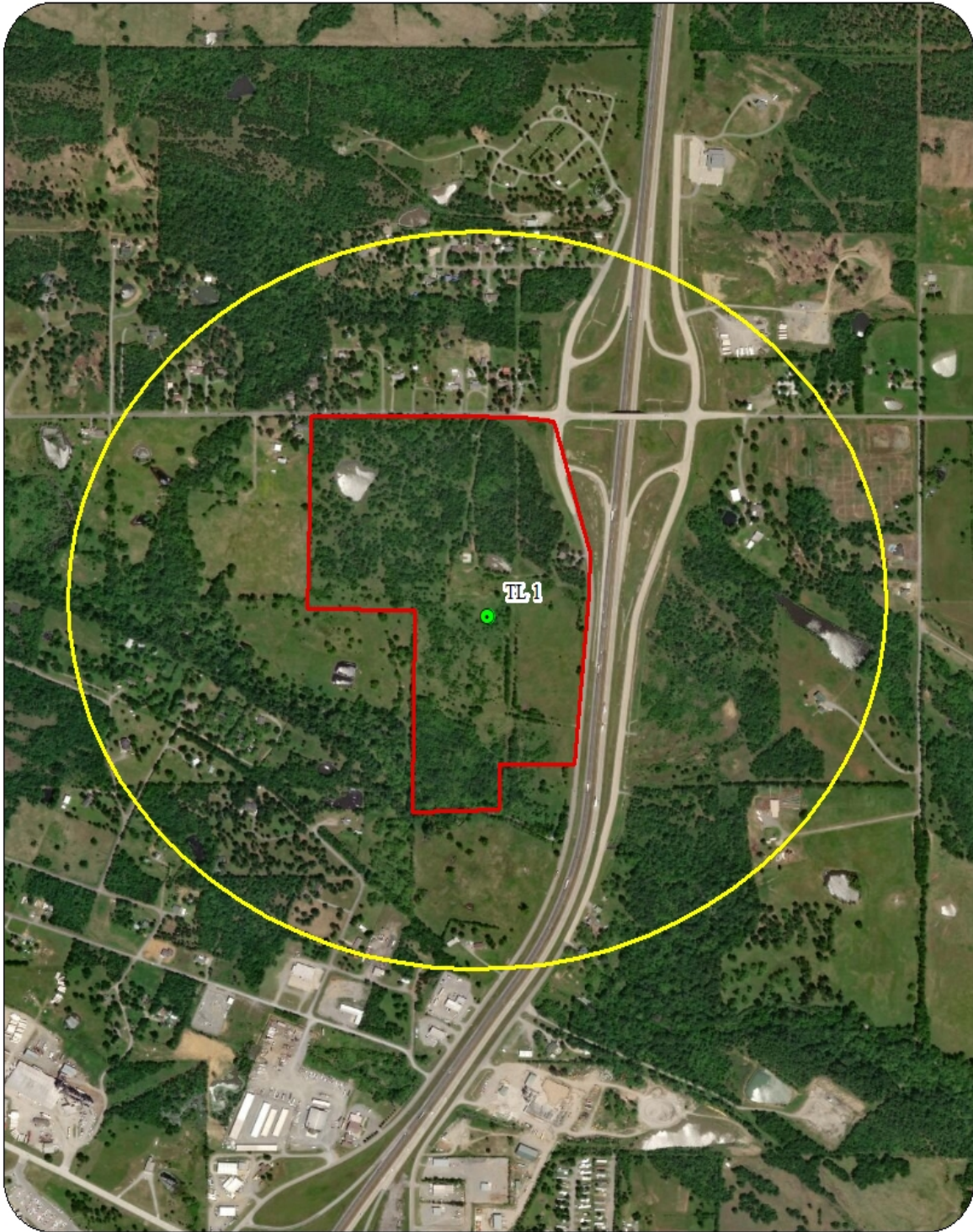
The ABB is large (1-1.5 inches) and has a shiny black appearance with four orange-red spots on the wing covers (elytra). A large red spot on the pronotum of the beetle is indicative of the species. The habitat requirements for this beetle are not fully known; however, the ABB is considered a habitat generalist and is known to occupy a diverse range of habitats. Habitats associated with the ABB include open grasslands, forests, as well as transitional areas. The beetle is a carrion feeder and utilizes small vertebrate carcasses for food and reproductive purposes. The ABB occurs in a variety of habitat types and will exploit virtually any possibilities where suitable forage and soil conditions may be found. According to the U.S. Fish and Wildlife Service, a minimum of 5 successive trap-nights are required to establish a sampling effort. Temperatures cannot fall below 60°F and wind speed cannot exceed 10 miles per hour for greater than 20% of the trap night between 9 pm and 4 am (1 hour 24 minutes). Failure to meet such specified trapping effort criteria would result in an additional trap night or trap nights. Meteorological data for this ABB survey effort was obtained from Weather Underground.

One trap-transect was selected to ensure appropriate survey coverage of the anticipated area of disturbance. The trapping method for the ABB survey was performed according to the Draft American Burying Beetle Range Wide Presence/Absence Live-trapping Survey Guidance, updated May 2015. One five-gallon bucket pitfall trap was used. Bait consisted of aged chicken quarters with no feathers and placed on 3 to 4 inches of soil. No additional trap nights were required to complete this survey.

IV. Survey Findings

No American Burying Beetles were captured during the survey effort. Two (2) American carrion beetle (*Necrophilia americana*) and 59 red-lined beetles (*Necrodes surinamensis*) were captured and released, along with several species of crickets, arachnids, isopods, arthropods and various other insects were collected. Atmospheric conditions during the ABB survey were fair with normal temperatures and wind velocities ranging from calm to moderate (0 to less than 10 mph). Weather conditions were within acceptable thresholds during the survey. No additional trap nights were required. The field survey data forms and survey summary sheet are found in *Appendix A*.

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ABB Trap 1 and Representative Habitat

Survey Capture Data:

Trap No.	Disturbed (0/1)	<i>americanus</i>	<i>orbicollis</i>	<i>tomentosus</i>	<i>pustulatus</i>	<i>marginatus</i>	<i>carolinus</i>	<i>sayi</i>	<i>Necrophilia</i>	<i>Necrodes</i>
1	0	0	0	0	0	0	0	0	2	59
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
Totals	0	0	0	0	0	0	0	0	2	59

Survey Weather Data:

Trap Night	Daytime Temp Range		Survey Period Temp Range		Daily Humidity Range	
	Min	Max	Min	Max	Min	Max
1	71.8	90.1	72.7	76.6	63	99
2	72.1	88.3	73	77.2	73	77.2
3	72.9	97.3	72.7	87.3	51	97
4	73.2	91	74.7	77.7	62	84
5	74.8	95.9	76.7	81.5	54	82
6	0	0	0	0	0	0
7	0	0	0	0	0	0
8	0	0	0	0	0	0

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V. Conclusion

The subject survey was performed in an effort to identify the presence of American Burying Beetles at or near the proposed land acquisition area. One trap-transect was deployed to ensure adequate coverage and maintained for 5 trap nights. The survey resulted in a negative presence of American Burying Beetles. Based on this negative collection, consultation with the Tulsa Ecological Field Services Office of the U.S. Fish and Wildlife Service may be required to secure survey concurrence prior to project development.

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VI. References

United States Department of Agriculture. Natural Resources Conservation Service, Soil Survey Staff. Web Soil Survey: <http://websoilsurvey.nrcs.usda.gov/>.

United States Fish and Wildlife Service. 2015. American Burying Beetle *Nicrophorus americanus* Oklahoma Presence/Absence Live-trapping Survey Guidance. 15 pages.

United States Geological Survey. 7.5-Minute Topographic Map

Weather Underground. The Weather Channel, LLC, 1993. Web. August 2019.

Woods, et al 2005. Oklahoma (color poster with map, Ecoregions of descriptive text, summary tables, and photographs): Reston, Virginia, U.S. Geological Survey (map scale 1:1,000,000).

Appendix A

Survey Data Forms

Appendix A: Data Collection Forms* American Burying Beetle *Nicrophorus americanus* Presence/Absence Live-trapping Survey Guidance**
ENTER DATA IN COLOR-SHADED CELLS ONLY IN CELLS THAT REQUIRE DATA ENTRY - DO NOT ENTER DATA IN WHITE CELLS OR HEADER ROWS

AMERICAN BURYPING BEETLE SURVEY DATA COLLECTION FORM (April 2017)

Project Name: Tribal Services Complex	No. of Transects Deployed: 1	Survey Night: 1
Project Description: Building and Road Construction	Trap Type: Above Ground	Date Checked: August 25, 2019
Action Agency/Proponent: Choctaw Nation	Bait Type: Aged Chicken	Month: August
Permittee: Steve Votaw	Trap Cover Size: 24"	Date: 29
TE Permit #: TE-043399	Set Date: 8/24/2019	Year: 2019
Survey Company: Eagle Environmental Consulting, Inc.	Survey End Date:	

Trap Location Data

Trap No.	Trap Coordinates		Legal Description			Gen Location	County	State	Vegetation Type	Primary Soil Name	Soil Description	Area	Weather Station
	Latitude	Longitude	Township	Range	Section								
1	34.9525	-95.7281	6N	15E	33	McAlester	Pittsburg	OK	Woodland/Field	Jenniss Pharoah Eram Compl	Loam	80	KOKMCALE15

Weather Data

Daytime Temps: 71.8 (min.) / 90.1 (max.)	Survey Period Temps: 72.7 (min.) / 76.6 (max.)	Humidity: 63 (min.) / 99 (max.)
Wind-10mph? No	Heavy Rain? No	Soil Moisture: 1.3299

Capture Data

Trap No.	Disturbed (Y=1/N=0)	<i>Nicrophorus</i> species								<i>Necrophilia americana</i>	<i>Necrodes surinamensis</i>	Trap Night Valid (No=0/Yes=1)	Time Checked ¹ :
		<i>americanus</i>	<i>orbicollis</i>	<i>tomentosus</i>	<i>pustulatus</i>	<i>marginatus</i>	<i>carolinus</i>	<i>sayi</i>					
1	0	0	0	0	0	0	0	0	0	0	16	1	752
0	0	0	0	0	0	0	0	0	0	0	0	0	

Totals	0	0	0	0	0	0	0	0	0	0	16	1	
No. of disturbed traps and/or bait (D): 0	Additional survey night required because of weather? 0		# Valid Trap Nights: 1										

List the individual ABB METRICS below and complete the appropriate columns. You will then COPY each row and PASTE into Individual ABB Capture Form BEGINNING at Cell A442 on Pg 6.

ABB Number	Caught in Trap No.	Male	Female	Unknown Sex	Male New ⁹	Male Old ⁹	Female New ⁹	Female Old ⁹	Male Unknown Age ⁹	Female Unknown Age ⁹	Dead	Pronotum Width (mm)	Picture (Yes=1/No=0)	Recapture ¹⁰	Newly Marked ¹¹

Automated Total: 0 Male, 0 Female, 0 Unknown Sex, 0 Male New⁹, 0 Male Old⁹, 0 Female New⁹, 0 Female Old⁹, 0 Male Unknown Age⁹, 0 Female Unknown Age⁹, 0 Dead, NA Pronotum Width (mm), 0 Picture

Comments: _____

No Additional survey night was required.

AMERICAN BURYING BEETLE SURVEY DATA COLLECTION FORM

Project Name:	Tribal Services Complex	Trap Type:	Above Ground	Survey Night:	6
Project Description:	Building and Road Construction	Bait Type:	Aged Chicken	Date Checked ¹ :	August 30, 2019
Action Agency/Proponent:	Choctaw Nation	Trap Cover Size:	24"	Permittee:	Steve Votaw
				TE Permit #:	TE-043399
				Survey Company:	Eagle Environmental Consulting, Inc.

Weather Data

Daytime Temps	(min.)	(max.)	Survey Period Temps	(min.)	(max.)	Humidity	(min.)	(max.)
Wind>10mph? ⁷	No		Heavy Rain? ⁸	No		Soil Moisture ⁴	1.3299	

Trap No.	Disturbed (Y=1/N=0)	Nicrophorus species								<i>Necrophila americana</i>	<i>Necrodes surinamensis</i>	Trap Night (No=0/Yes=1)	Time Checked ¹ :
		<i>americanus</i>	<i>orbicollis</i>	<i>tomentosus</i>	<i>pustulatus</i>	<i>marginatus</i>	<i>carolinus</i>	<i>sayi</i>	<i>americanus</i>	<i>surinamensis</i>			
1	0	0	0	0	0	0	0	0	0	0	0		
0	0	0	0	0	0	0	0	0	0	0	0		
0	0	0	0	0	0	0	0	0	0	0	0		
0	0	0	0	0	0	0	0	0	0	0	0		
0	0	0	0	0	0	0	0	0	0	0	0		
0	0	0	0	0	0	0	0	0	0	0	0		
0	0	0	0	0	0	0	0	0	0	0	0		
0	0	0	0	0	0	0	0	0	0	0	0		
0	0	0	0	0	0	0	0	0	0	0	0		
0	0	0	0	0	0	0	0	0	0	0	0		
0	0	0	0	0	0	0	0	0	0	0	0		
0	0	0	0	0	0	0	0	0	0	0	0		
0	0	0	0	0	0	0	0	0	0	0	0		
0	0	0	0	0	0	0	0	0	0	0	0		
0	0	0	0	0	0	0	0	0	0	0	0		
0	0	0	0	0	0	0	0	0	0	0	0		
0	0	0	0	0	0	0	0	0	0	0	0		
0	0	0	0	0	0	0	0	0	0	0	0		
0	0	0	0	0	0	0	0	0	0	0	0		
Totals	0	0	0	0	0	0	0	0	0	0	0		

No. of disturbed traps and/or bait (D): **0** Additional survey night required because of weather?² **0** # Valid Trap Nights: **0**

(No=0/Yes=1)

List the individual ABB METRICS below and complete the appropriate columns. You will then COPY each row and PASTE into Individual ABB Capture Form on Pg 6.

ABB Number	Caught in Trap No.	Male	Female	Unknown Sex	Male New ³	Male Old ³	Female New ³	Female Old ³	Male Unknown Age ⁶	Female Unknown Age ⁶	Dead	Pronotum Width (mm)	Picture (Yes=1/No=0)	Recapture ¹⁰	Newly Marked ¹¹
Automated Total	0	0	0	0	0	0	0	0	0	0	0	NA	0		

Comments:

ADD TEXT HERE IF: Additional survey night was not required.

AMERICAN BURYING BEETLE SURVEY DATA COLLECTION FORM

Project Name:	Tribal Services Complex	Trap Type:	Above Ground	Survey Night:	7
Project Description:	Building and Road Construction	Bait Type:	Aged Chicken	Date Checked ¹ :	August 31, 2019
Action Agency/Proponent:	Choctaw Nation	Trap Cover Size:	24"	Permittee:	Steve Votaw
				TE Permit #:	TE-043399
				Survey Company:	Eagle Environmental Consulting, Inc.

Weather Data

Daytime Temps	(min.)	(max.)	Survey Period Temps	(min.)	(max.)	Humidity	(min.)	(max.)
Wind>10mph? ⁷	No		Heavy Rain? ⁸	No		Soil Moisture ⁴	1.3299	

Trap No.	Disturbed (Y=1/N=0)	Nicrophorus species								<i>Necrophila americana</i>	<i>Necrodes surinamensis</i>	Trap Night (No=0/Yes=1)	Time Checked ¹ :
		<i>americanus</i>	<i>orbicollis</i>	<i>tomentosus</i>	<i>pustulatus</i>	<i>marginatus</i>	<i>carolinus</i>	<i>sayi</i>	<i>americanus</i>	<i>surinamensis</i>			
1	0	0	0	0	0	0	0	0	0	0	0		
0	0	0	0	0	0	0	0	0	0	0	0		
0	0	0	0	0	0	0	0	0	0	0	0		
0	0	0	0	0	0	0	0	0	0	0	0		
0	0	0	0	0	0	0	0	0	0	0	0		
0	0	0	0	0	0	0	0	0	0	0	0		
0	0	0	0	0	0	0	0	0	0	0	0		
0	0	0	0	0	0	0	0	0	0	0	0		
0	0	0	0	0	0	0	0	0	0	0	0		
0	0	0	0	0	0	0	0	0	0	0	0		
0	0	0	0	0	0	0	0	0	0	0	0		
0	0	0	0	0	0	0	0	0	0	0	0		
0	0	0	0	0	0	0	0	0	0	0	0		
0	0	0	0	0	0	0	0	0	0	0	0		
0	0	0	0	0	0	0	0	0	0	0	0		
0	0	0	0	0	0	0	0	0	0	0	0		
0	0	0	0	0	0	0	0	0	0	0	0		
0	0	0	0	0	0	0	0	0	0	0	0		
0	0	0	0	0	0	0	0	0	0	0	0		
0	0	0	0	0	0	0	0	0	0	0	0		
Totals	0	0	0	0	0	0	0	0	0	0	0		

No. of disturbed traps and/or bait (D): **0** Additional survey night required because of weather?² **0** # Valid Trap Nights: **0**

(No=0/Yes=1)

List the individual ABB METRICS below and complete the appropriate columns. You will then COPY each row and PASTE into Individual ABB Capture Form on Pg 6.

ABB Number	Caught in Trap No.	Male	Female	Unknown Sex	Male New ³	Male Old ³	Female New ³	Female Old ³	Male Unknown Age ⁶	Female Unknown Age ⁶	Dead	Pronotum Width (mm)	Picture (Yes=1/No=0)	Recapture ¹⁰	Newly Marked ¹¹
Automated Total	0	0	0	0	0	0	0	0	0	0	0	NA	0		

Comments:

DATA AUTOMATICALLY CALCULATED - DO NOT ENTER DATA IN BLOCKS 1, 3, OR 4

Total Number of Traps:

DATA ENTRY IS ONLY REQUIRED IN DATA BLOCK 2

BLOCK 1 - INDIVIDUAL TRAP CAPTURE DATA TOTALS BY SPECIES

!!!!!!DATA ENTRY IN THIS BLOCK NOT REQUIRED!!!!!!											Total Valid Trap Nights
Trap No.	Disturbed (0/1)	<i>americanus</i>	<i>orbicollis</i>	<i>tomentosus</i>	<i>pustulatus</i>	<i>marginatus</i>	<i>carolinus</i>	<i>sayi</i>	<i>Necrophila</i>	<i>Necrodes</i>	
1	0	0	0	0	0	0	0	0	2	59	5
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
Totals	0	0	0	0	0	0	0	0	2	59	5

No. of disturbed traps and/or bait (D):

Additional survey night required because of weather?⁸

BLOCK 2 - Individual ABB Capture Data - DATA ENTRY IS REQUIRED IN THIS BLOCK

COPY the INDIVIDUAL ABB Capture Data from Nightly Survey Forms and PASTE into the appropriate ROW BY ABB Number.

ABB Number	Caught in Trap No.	Male	Female	Unknown Sex	Male New ⁹	Male Old ⁹	Female New ⁹	Female Old ⁹	Male Unknown Age ⁹	Female Unknown Age ⁹	Dead	Pronotum Width (mm)	Picture (Yes=1/No=0)	Recapture ¹⁰	Newly Marked ¹¹
1															
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
14															
15															
16															
17															
18															
19															
20															
Total ABB	0	0	0	0	0	0	0	0	0	0	0	NA	0	0	0

Comments:

Total Number of Traps:

!!!!!!DO NOT ENTER ANY DATA IN THIS DATA BLOCK!!!!!!

BLOCK 3 - Total ABB Capture Data by Trap / Transect - Data from THIS BLOCK autopopulates into the Survey Summary Form

Trap No.	Total ABB	Male	Female	Unknown Sex	Male New ⁹	Male Old ⁹	Female New ⁹	Female Old ⁹	Male Unknown Age ⁹	Female Unknown Age ⁹	Dead	Total Trap/Bait Disturbed	Recapture ¹⁰	Newly Marked ¹¹
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	0	0	0	0	0	0	0	0	0	0	0	0	0	0

BLOCK 4 - Cumulative Survey Period Weather Data Summary - NO DATA ENTRY REQUIRED IN THIS BLOCK

Trap Night	Daytime Temp Range		Survey Period Temp Range		Daily Humidity Range	
	Min	Max	Min	Max	Min	Max
1	71.8	90.1	72.7	76.6	63	99
2	72.1	88.3	73	77.2	73	77.2
3	72.9	97.3	72.7	87.3	51	97
4	73.2	91	74.7	77.7	62	84
5	74.8	95.9	76.7	81.5	54	82
6	0	0	0	0	0	0
7	0	0	0	0	0	0
8	0	0	0	0	0	0

***** - For surveys involving more than 10 transects, the surveyor should complete additional data forms. Project title information should remain the same, however the transect number(s) should continue in sequential order, i.e. Trap 11, 12...20.**

1. Date and time refer to when trap is checked;
 2. Check that legal description fits decimal degrees location. Lat/long MUST be in decimal degrees, NAD 83
 3. Max/Min temp from 9 pm to 4 am prior to checking traps, must use data from www.wunderground.com
 4. Soil moisture must be obtained by obtaining the TR-05 report from http://www.mesonet.org/index.php/weather/daily_data_retrieval.
 5. Rain from 9 pm to 4 am, must use data from www.wunderground.com
 6. Wind exceeds 10 mph > than 20% of time between 9 pm to 4 am
 7. Additional trapping required if any metrics exceed the allowable thresholds.
 8. Determine total number of disturbed traps over all 5 survey nights. Any disturbance to 5-gallon traps requires an additional night of survey effort.
 9. OLD=breeding adult; NEW=newly enclosed adult; UNK=age cannot be determined.
 10. Recaptures refer to color and number of bee tag on beetles that have been previously marked.
 11. Newly marked males and females refers to color, number of bee tag, and age of beetle (e.g. R54[old]).
 Heavy Rain is defined by the World Meteorological Organization (<http://severe.worldweather.org/raindoc.html>) as "Rainfall greater than or equal to 50 mm [1.9685 inches] in the past 24 hours."
 Last updated April 2017