Terrestrial Species of Concern Study for the Pensacola Hydroelectric Project (FERC Project No. 1494) Craig, Delaware, Mayes, and Ottawa Counties, Oklahoma Updated Study Report

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PREPARED FOR



GRAND RIVER DAM AUTHORITY



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SECTION 1 BACKGROUND

This report serves as an update to the 2021 Initial Study Report (ISR) re: beetles and bats.

The purpose of the American Burying Beetle (*Nicrophorus americanus*; ABB) portion of this report is to provide a comparison of distributions of beetles to inundation maps generated by the Comprehensive Hydraulic Model (CHM) to characterize the effects of anticipated operations of the Pensacola Hydroelectric Project (Project) operations.

The purpose of the bat portion of this report is to assess the degree to which anticipated Project operations under the new license would inundate the main entrance to Beaver Dam Cave and compare the frequency of inundation with that associated with baseline operations. Grand River Dam Authority (GRDA) has determined whether the secondary exit suffices to provide an alternative access by gray bats (*Myotis grisescens*) to the cave (during times of inundation under anticipated Project operations).

Access to cave DL-2 (Beaver Dam Cave) and cave DL-91 (Twin Cave) has the potential to be affected by anticipated Project operations. Data generated by the CHM as part of the H&H Study were used and analyzed with respect to the gray bat to determine potential effects of anticipated Project operations to the species.

SECTION 2 AMERICAN BURYING BEETLE

Horizon conducted a 2021 and 2022 American burying beetle (*Nicrophorus americanus*; ABB) presence/absence survey in accordance with the USFWS American Burying Beetle Range-Wide Presence/Absence Survey Guidance, dated May 2018 (Guidance). Communication with Kevin Stubbs (USFWS) (Appendix C) ensured Horizon that our Project Area sufficiently covered beetle habitat types including those located in GRDA's Wildlife Management Areas (WMA). The Project Area is located within the range of the federally threatened ABB, but outside of any conservation priority area (CPA) (Appendix A).

ABBs are habitat generalists and may use a variety of habitats that provide friable, moist soils and contain leaf litter and a variety of native vegetation above 8 inches in height to both retain soil moisture and support prey species. The USFWS provides guidance for what is considered unsuitable ABB habitat in their American Burying Beetle Conservation Strategy for the Establishment, Management, and Operation of Mitigation Lands for Impacts that Occur in Oklahoma guidance document, dated 1 September 2019.

ABB Habitat Exclusions

While the ABB uses a wide variety of habitats, the USFWS currently believes that areas exhibiting the following characteristics will not be of conservation value to ABBs and will not be credited as mitigation, except as possible buffer credits described below under the Crediting Method section. Areas exhibiting these characteristics should be excluded from mitigation lands because they are considered unfavorable for use by ABBs based on disturbance regime, vegetation structure, unsuitable soil conditions, and carrion availability:

- 1. Land that is tilled on a regular basis, planted in monoculture, and does not contain native vegetation.
- 2. Pasture or grassland that has been maintained through frequent mowing, grazing, or herbicide application at a height of 20 cm (8 inches) or less.
- 3. Land that has already been developed and no longer exhibits topsoil, leaf litter, or vegetation.
- 4. Urban areas with maintained lawns, paved surfaces, or roadways.
- 5. Stockpiled soil without vegetation.
- 6. Wetlands or permanent waterbodies with standing water or saturated soils. Areas adjacent to wetlands and/or riparian areas are not considered unfavorable for the ABB, as they may be important for ABBs seeking moist soils during dry conditions.

2.1 ABB Study Year One

As reported in the ISR, six traps were deployed within suitable, representative terrain within the Project Area. Trap sites were selected based on suitable habitat and capture of the most significant in size terrestrial areas within the study area boundary in Delaware and Ottawa counties. Surveys were conducted between 18 July and 23 July 2021 with valid weather conditions through the duration of the survey effort. No ABBs were found during the 2021 presence/absence survey (**Figure 1**).

2.2 ABB Study Year Two

Six baited pitfall bucket traps were deployed within suitable, representative terrain on 9 June 2022 in Delaware and Ottawa counties. This presence/absence survey was conducted as an early season survey in accordance with the approved study plan. Trap placement was also selected based on discussion and advisement of USFWS staff, in email communication dated 25 March 2022. Mr. Stubbs requested that the traps be placed within the best suitable habitat including designated WMAs and the Coal Creek wetland mitigation site (**Figure 2**).

The survey continued with five nights of valid weather parameters. Guidance defines valid weather parameters as:

- 1. Nighttime temperature during the survey period above 60° F (15.5 C)
- 2. Wind speed no greater than 10 mph in excess of 20% of the time (1 hour 24 minutes) between 9:00 p.m. and 4:00 a.m.,
- 3. Precipitation less than 0.5 inches between 9:00 p.m. and 4:00 a.m.

Weather conditions were valid throughout the course of the survey effort. No ABBs were captured or observed during this survey. These negative survey findings indicate that the ABB is not active within the Project Area; thus, take (defined by the Endangered Species Act [ESA] as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect any threatened or endangered species") is not expected as a result of this project.

SECTION 3 BATS

Based on the respective roosting habitats of the two bat species and known patterns of cave use adjacent to Grand Lake, the federally threatened northern long-eared bat (*Myotis septentrionalis*) is unlikely to be affected by alterations in cave access associated with Project operations. As a result, for this objective, GRDA will focus its efforts on federally endangered gray bats (*Myotis grisescens*) in the caves which they are known to use.

Cave DL-2 (Beaver Dam Cave) in Delaware County is adjacent to Drowning Creek, a tributary of Grand Lake, and is within the maximum inundation area on the lentic conversion maps (**Figures 3 and 4**). The cave passage is <65 meters (m) long with a single historical roost site for gray bats located 4 m above a persistent stream and about 5 m from the entrance to the cave. Complete inundation of the cave passage occurs at 752 feet in elevation. The roost was first documented as housing a colony of gray bats in 1981 when the colony was estimated to be 13,700 bats. Except during major flood events, based on recent exit and capture surveys at the entrance, the size and status (lactating females) of the colony remains relatively constant for the past 25 years.

Cave DL-91 (Twin Cave) is also located in Delaware County about 1 kilometer (km) from Grand Lake with an elevation (840 feet) precluding any threat of inundation. It is also outside of the maximum inundation area on the lentic conversion maps (**Figures 3 and 5**). The cave has a mapped passage of 803 m and has historical records of nine roost sites for gray bats. Prior to 1973, DL-91 historically housed the largest colony of gray bats in Oklahoma, estimated to be as many as 113,000 bats (Martin et al. 2000). Recent population estimates of the summer colony have been as high as 31,962 bats.

3.1 **Procedures in 2021 Maternity Season**

Infrared (IR)-illuminated entrance and night vision optics were used to conduct non-intrusive exit surveys and population estimates of gray bat colonies exiting caves DL-2 and DL-91 in the 2021 summer maternity and post-maternity season. Such surveys are used to document habitation, assist in estimating colony size at the respective caves, and monitor movements of the colony during potential high water and flood events on Grand Lake.

Exit surveys were conducted at cave DL-2 on 22 June and at cave DL-91 on 24 June and again on 16 July 2021 (Table 1). The post-maternity colony population estimate at cave DL-91 during late summer 2021 (Table 1) was within the range of 10,000 to 29,905 bats (average =18,245) over the past decade (Table 3).

Table 1: Population estimates of gray bat colonies at caves DL-2 and DL-91 in Delaware	
County, OK in the 2021 maternity season	

Date	Date Survey Method Populatio		Population at Cave DL-91
6/22/2021	Exit Survey	11,800	
6/24/2021	Exit Survey		510

Date	Survey Method	Population at Cave DL-2	Population at Cave DL-91	
7/16/2021	Exit Survey		20,440	

¹ Gray bat colony size estimates are based on exit surveys using infrared-illuminated entrances and night vision optics during summer 2021.

3.2 **Procedures in 2022 Maternity Season**

An IR-illuminated entrance and night vision optics were used to conduct non-intrusive exit surveys and population estimates of gray bat colonies exiting caves DL-2 and DL-91 in the 2022 summer maternity and post-maternity season. Such surveys are used to document habitation, assist in estimating colony size at the respective caves, and monitor movements of the colony during potential high water and flood events on Grand Lake.

Exit surveys were conducted at cave DL-2 on 27 June and at cave DL-91 on 10 May during a high-water event, and 22 June and 4 August (Table 1). The post-maternity colony population estimate at cave DL-91 during late summer 2022 (Table 2) was within the range of 10,000 to 29,905 bats (average =19,877) over the past decade (Table 3).

Table 2: Population estimates of gray bat colonies¹ at caves DL-2 and DL-91 in Delaware County, OK in the 2022 maternity season

Date Survey Method		Population at Cave DL-2	Population at Cave DL-91
5/10/2022	Exit Survey		20,620
6/22/2022	Exit Survey		6,600
6/27/2022	Exit Survey	13,300	
8/4/2022	Exit Survey		23,877

¹ Gray bat colony size estimates are based on exit surveys using infrared-illuminated entrances and night vision optics during summer 2022.

Table 3: Ten-year post-maternity population² estimates of the colony of gray bats using caves DL-2 and DI-91 in Delaware County, Oklahoma

Date	Population at Cave DL-91
8/22/2013	29,905
9/11/2014	18,015
8/5/2015	20,585
7/21/2016	16,520
9/12/2017	19,340

Date	Population at Cave DL-91
8/30/2018	18,000
5/21/2019	15,200
8/25/2020	16,883
7/16/2021	20,440
8/4/2022	23,877

² The post-maternity colony is historically found at cave DL-91.

Cave abandonment may result from high water events, or late-season migration after young become volant as often occurs in other areas of the species' range. Under favorable conditions, the colony ultimately vacates the maternity cave at DL-2 entirely in mid-summer and migrates to cave DL-91 located <5 km away (Grigsby et al. 1993; Martin et al. 2000) where the colony tends to remain until migration to hibernacula in November. Although cave DL-91 has intermittently served as a favorable maternity location, it is possible that it provides suboptimal climate conditions for a maternity colony compared to cave DL-2 with respect to microclimate and proximity to an abundant food source for developing young. Annual mid-summer migration phenomena are intriguing because migration of any type elicits its own inherent effects on animal populations that are exacerbated in young and reproductive adults.

During a high-water event in early May 2022 the exit survey at DL-91 was greater than 20,000 bats indicating the colony successfully vacated DL-2 prior to passage inundation by the rising Grand Lake levels. In review of surveys since 2007 there have now been 10 such high-water events resulting in the colony's successful relocation to cave DL-91. This leads to a trend of the colony using each cave on average about the same number of years as the maternity colony roost, and the ecological importance of management and monitoring of both sites. Historically when flooding events have occurred early in the spring followed by receding lake levels (April and early May), it is not unusual for the colony to return to cave DL-2 for the maternity period. This phenomenon was verified again on 27 June 2022 when the population was observed in cave DL-2 for the maternity period (Table 2). Observations from the 2022 season once again supports historical evidence that during high water or flood events during the maternity season, the maternity colony of the endangered gray bat can successfully vacate cave DL-2 and migrate to cave DL-91.

Complete inundation of the cave passage of DL-2 occurs at about elevation 752 feet Pensacola Datum (PD). When Grand Lake is at about elevation 751 feet PD, only about one foot of flyway exists between the top of the water in the cave and the rock ceiling of the flyway, likely resulting in a significant to normal behavior including feeding, rearing of young, and sheltering, and possibly forcing evacuation of the colony to the alternative cave (Table 4). Forcing the colony to vacate during critical maternity periods (March through July) likely adversely affects pregnant or lactating females, and non-volant or newly volant young. If bats become trapped in cave DL-2, they could survive only a limited amount of time due to the high energy demands of raising young. Other potential adverse effects include the stress of being trapped, drowning, and, if adults are trapped outside the cave, stress and mortality of non-volant young.

In October 2008 a small, high passage within cave DL-2 was identified and minimally excavated and enlarged. Enlarging this passage was suspected to provide an alternative escape route for exiting bats, particularly during high water. Additional excavation and enlargement of this second-high passage was completed in October 2013. The length of the high passage was about 5m and was widened to about 0.40 meters wide by 0.50 meters tall. An inspection of the passage following a flood event in summer 2015, and again during this project period in 2022, revealed scattered guano in the enlarged passage indicating use by bats. The post-inundation monitoring visit to the cave on 27 June 2022 failed to give any indication that take had occurred as a result of inundation in early May 2022.

Year	Date Beginning	Date Ending	Maximum Elevation (ft)	Total Duration	Impact on Colony
2007	3 July	16 July	754.54	14 days	Successfully Vacated
2008	11 April	20 April	753.04	10 days	Successfully Vacated
2008	13 June	26 June	752.48	14 days	Successfully Vacated
2011	27 April	28 April	750.80	2 days	Successfully Vacated
2011	25 May	26 May	751.71	2 days	Successfully Vacated
2015	27 May	22 June	754.89	27 days	Successfully Vacated
2017	30 April	25 May	754.77	26 days	Successfully Vacated
2019	14 May	15 July	755.02	63 days	Successfully Vacated
2022	7 May	10 May	753.30	3 days	Successfully Vacated

Table 4: Records of highwater events³ where the elevation of Grand Lake exceeded elevation 750.00 feet PD from 2005-2022

³ At elevation 752 feet PD, the existing flyway inside cave DL-2 is inundated preventing colony exit and re-entry.

SECTION 4 ANALYSIS

In support of the Terrestrial Species Study, GRDA performed additional simulations that were used to assess operational impact to specific terrestrial species. One product of the simulations specific to the ABB analysis was the development of maps showing areas of potential lentic or lotic conversion which could impact the habits of specific terrestrial species.

The seasonal period identified by the Terrestrial Species Study team was the entire calendar year, January 1 to December 31 because ABBs could be impacted during both their active and inactive or hibernation periods each year.

For both anticipated operations and baseline operations, the seasonal median operational level and inflows were simulated in the CHM. Results and maps were provided to the Terrestrial Species Study team.

In accordance with Section 2.6 of the Terrestrial Species Revised Study Plan, maximum inundation was also identified on all terrestrial maps created. The maximum inundation was virtually identical for anticipated and baseline operations because the maximum inundation boundary occurs when the USACE is in flood control operations, and it is not an effect of GRDA baseline or anticipated operations. Therefore, to analyze the impacts of the baseline versus the anticipated Project operations, the normal (median) inundations are used because they occur on such a regular basis that a habitat conversion can occur versus just a regular inundation.

See Appendix A, **Figures 6.1 – 6.23** for the Terrestrial Species Lentic Conversion Maps.

The second product of the CHM for the Terrestrial Species Study was specific to the gray bat analysis and provided the percentage of time the reservoir would be above the key reservoir elevations of 746 feet PD, 751 feet PD, and 752 feet PD for both the baseline and anticipated Project operations during the key season for gray bats of April 1 to July 31 each year.

The results are presented in Table 5.

Percentage of Time Above	Baseline	Anticipated	Percentag

Table 5: Percentage of time Grand Lake Reservoir is above key elevations

Percentage of Time Above Reservoir Elevation	Baseline Operations	Anticipated Operations	Percentage Increase
746 feet PD	16.5%	16.9%	0.4%
751 feet PD	2.9%	2.7%	(0.2%)
752 feet PD	1.9%	1.9%	0%

4.1 ABB

The comparison of the baseline and anticipated Project operations yielded 2.79% terrestrial habitat may become aquatic habitat as a result of the anticipated operations (**Figures 6.1 – 6.23**).

Much of this area is comprised of unsuitable ABB habitat such as rocky and/or sandy shoreline devoid of vegetation. Further, no ABBs have been located within the two years of project-specific

study efforts nor have any ABBs been found within Delaware or Ottawa Counties in historical records provided by the USFWS spanning 1979 - 2018 (**Figure 7**). As a result, despite the expectation that some suitable ABB habitat may be converted to aquatic habitat, there is no reasonable expectation that ABBs are or have been using the habitat and thus, the impact, if any, is negligible.

4.2 Bats

The CHM analysis shows under the anticipated operations of the Project, the Grand Lake Reservoir will exceed 746 feet PD, the reservoir elevation at which water flows into the entrance of cave DL-2 (Beaver Dam) 16.5% under baseline operations and 16.9% under anticipated operations. The anticipated operations will cause this situation to occur 0.4% more frequently.

Evacuation of DL-2 generally does not begin to occur until Grand Lake reaches an elevation of approximately 751 feet PD. According to the CHM analysis, under the anticipated operations of the Project, the Grand Lake Reservoir will exceed 751 feet PD, 2.9% under baseline operations and 2.7% under anticipated operations. The anticipated operations will cause this situation to occur 0.2% less frequently.

A Grand Lake Reservoir elevation of 752 feet PD results in a complete inundation of the cave passage in DL-2 forcing evacuation. According to the CHM analysis, under the anticipated operations of the Project, the Grand Lake Reservoir will exceed 752 feet PD, 1.9% under baseline operations and 1.9% under anticipated operations. The anticipated operations will cause this situation to occur the same percentage of time as the baseline operations.

The average post-maternity colony size illustrates relative consistency, ranging from 15,200 to 29,905 bats with an average colony size of 19,877 gray bats for the past 10 years. (Table 2). Efforts should be concentrated on maintaining strong ties with the landowner of the access to cave DL-2, so that similar security efforts can continue there for the long-term.

In sum, the gray bat colony sharing caves DL-2 and DL-91 each summer appears to maintain a stable population size.

The CHM analysis shows very little increase (0.4%) in the potential for water to enter the cave opening of DL-2 at an elevation of 746 feet PD and very little decrease in the potential for water to enter the cave to an elevation of 751 feet PD that possibly forces and evacuation of the colony to the alternative cave. Lastly, the CHM results indicate there is no change in the percentage of time the passage in cave DL-2 becomes entirely submerged at an elevation of 752 feet PD under the anticipated operations.

SECTION 5 CONCLUSIONS

5.1 ABB

Much of the habitat within the Project area is shoreline, and as such, is largely unsuitable for the ABB (rocky and/or sandy shoreline devoid of vegetation). Further, no ABBs have been located within the two years of project-specific study efforts nor have any ABBs been found within Delaware or Ottawa Counties, nor within the vicinity of the project area within Craig and Mayes Counties in historical records provided by the USFWS spanning 1979 – 2018. As a result, despite the expectation that some suitable ABB habitat could be converted to aquatic habitat, there is no reasonable expectation that ABBs are or have been using the habitat and thus, the impact, if any, is negligible and no further coordination with the USFWS is recommended.

5.2 Bats

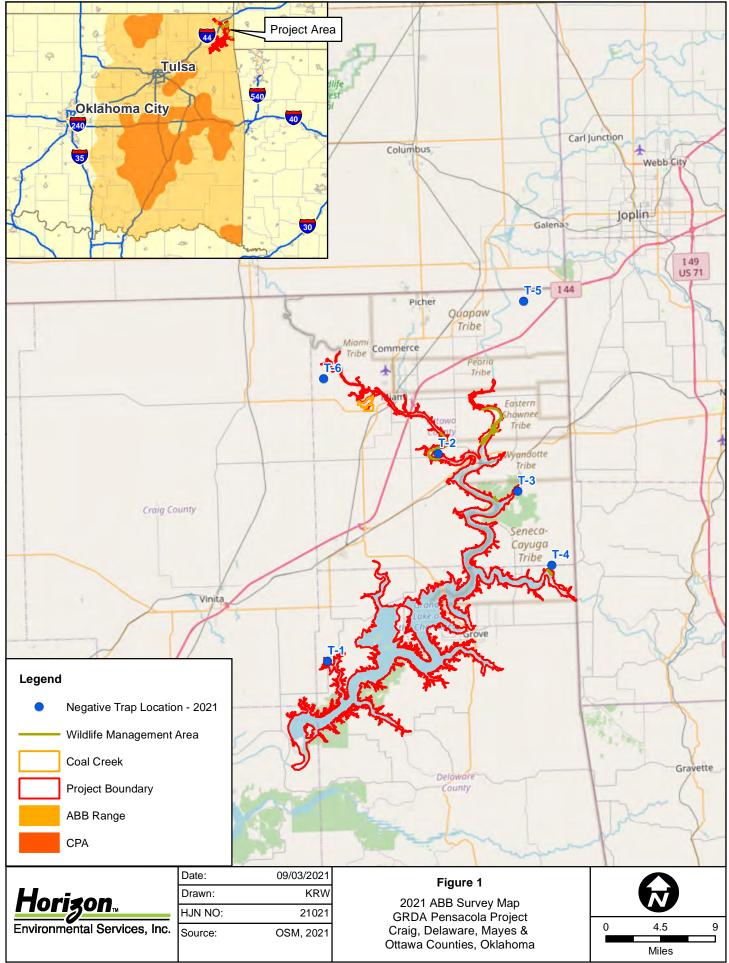
The findings of the gray bat study indicate the secondary exit suffices to provide an alternative access by gray bats in cave DL-2. Regardless of the efficacy of the alternative access, the entrance to cave DL-2 does not become completely inundated to elevations 751 feet PD and greater (complete inundation is 752 feet PD) any more frequently under the anticipated Project operations than it becomes inundated under the baseline Project operations. Therefore, the impact to gray bats is negligible.

SECTION 6 REFERENCES

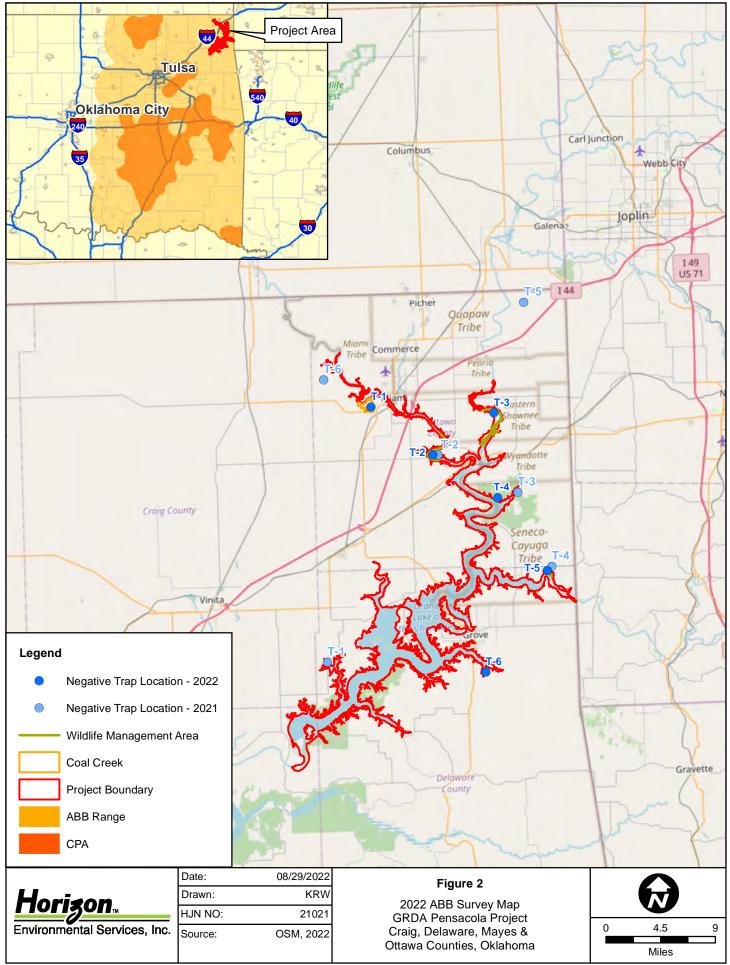
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APPENDIX A Figures

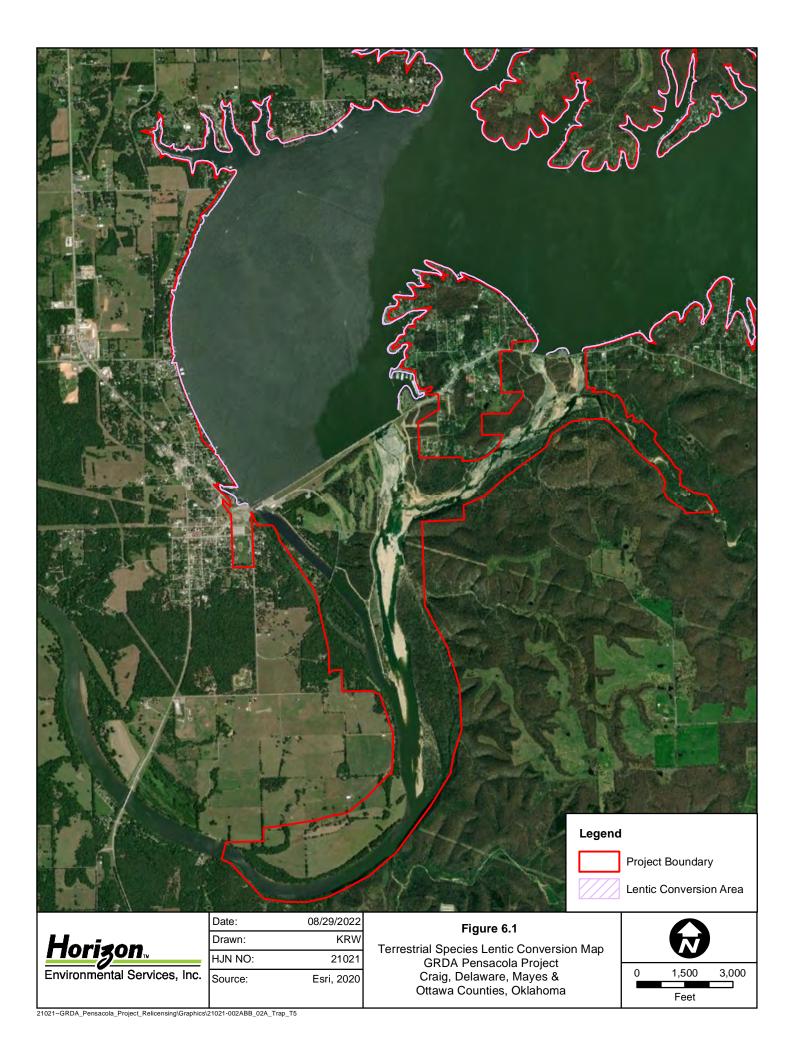


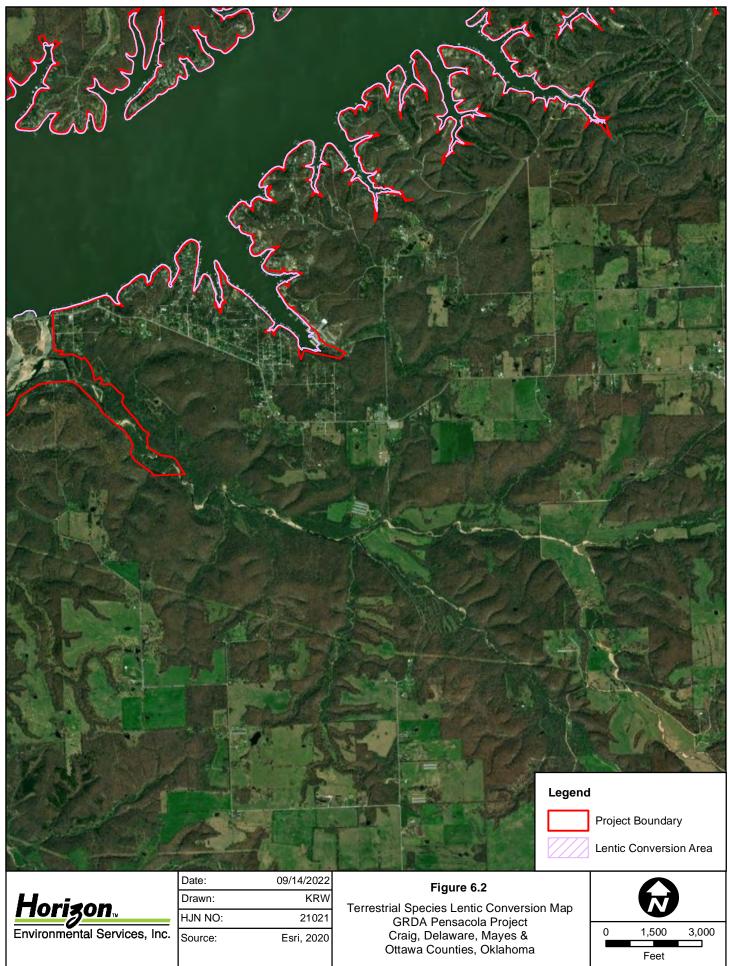
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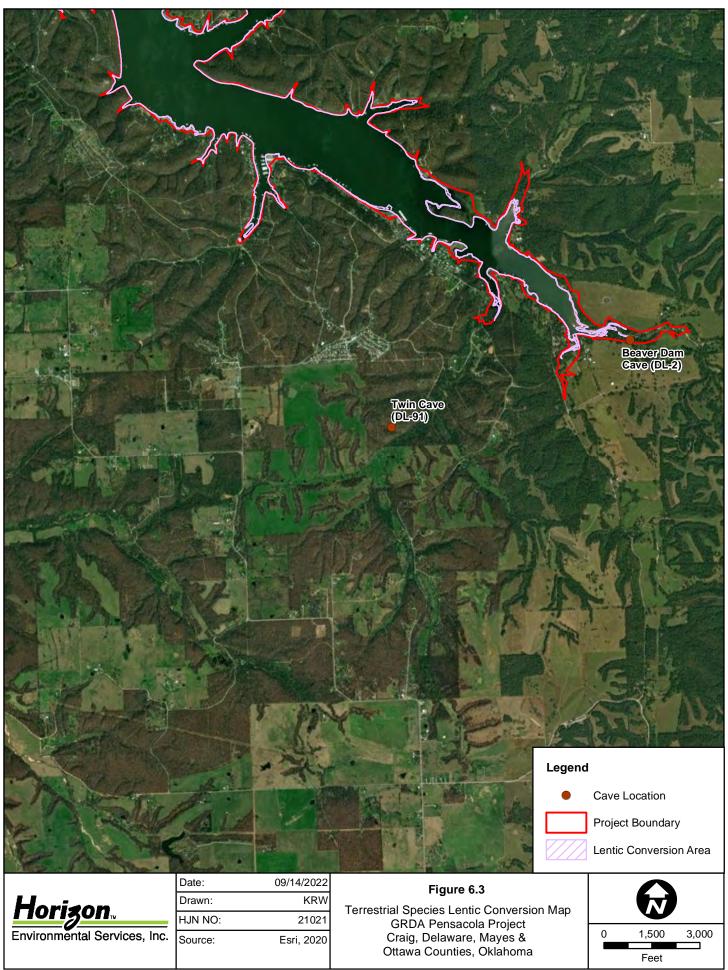


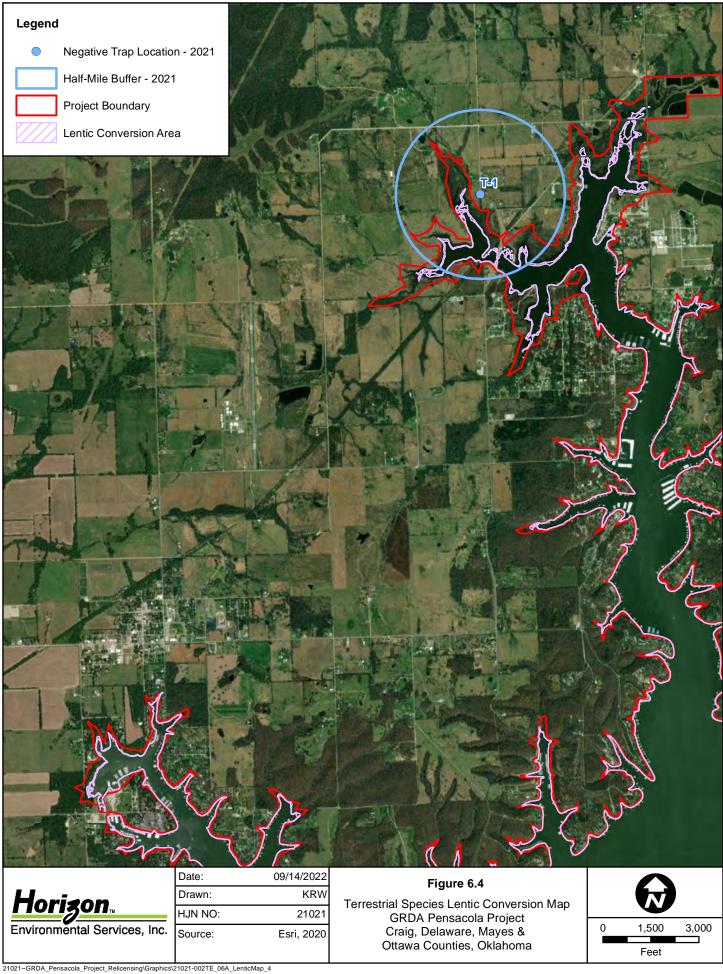
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Figures 3 - 5 are filed as privileged due to sensitive location information.

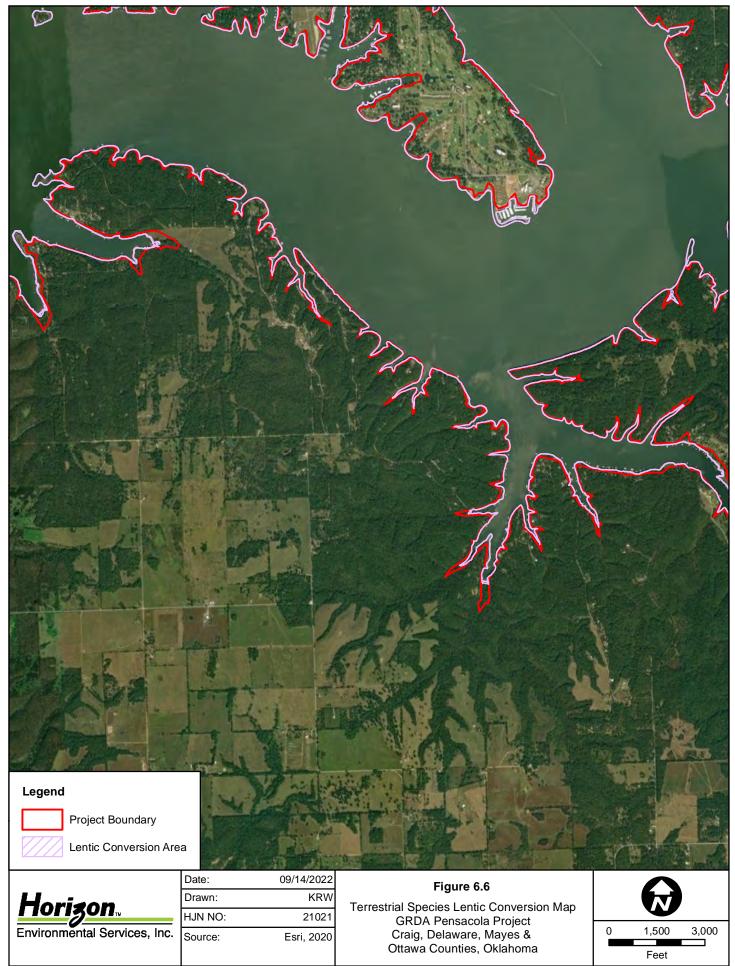


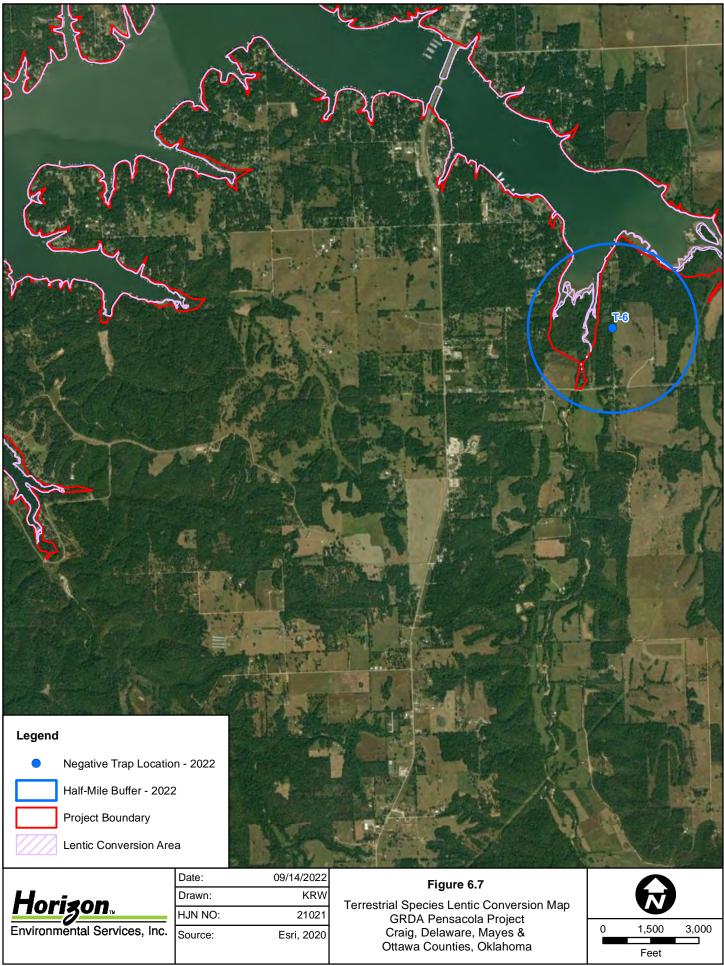


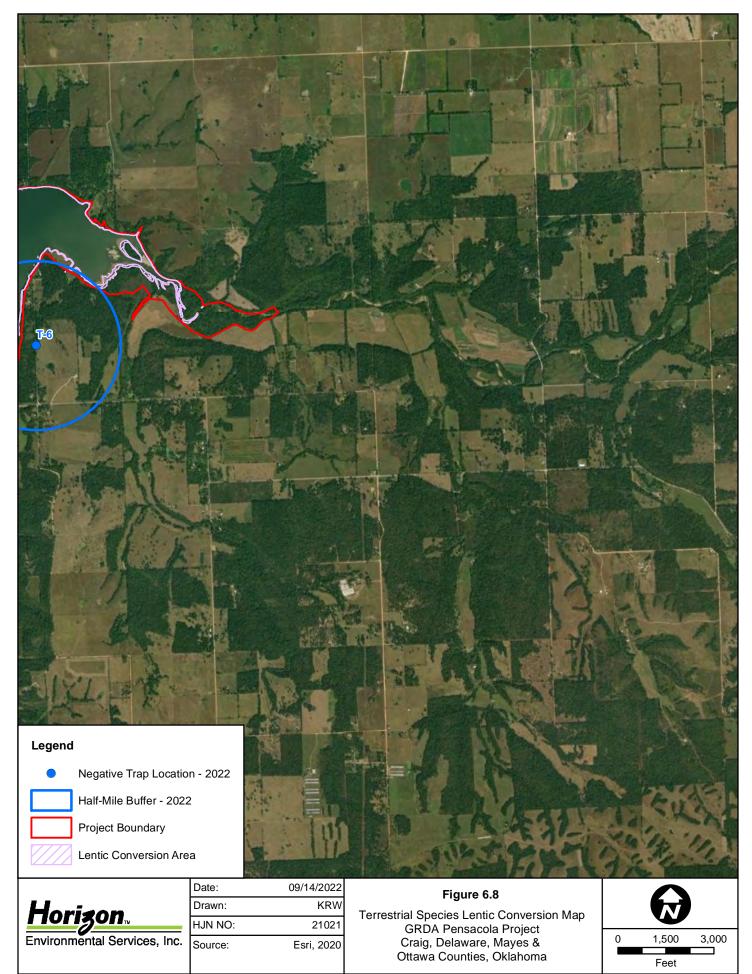






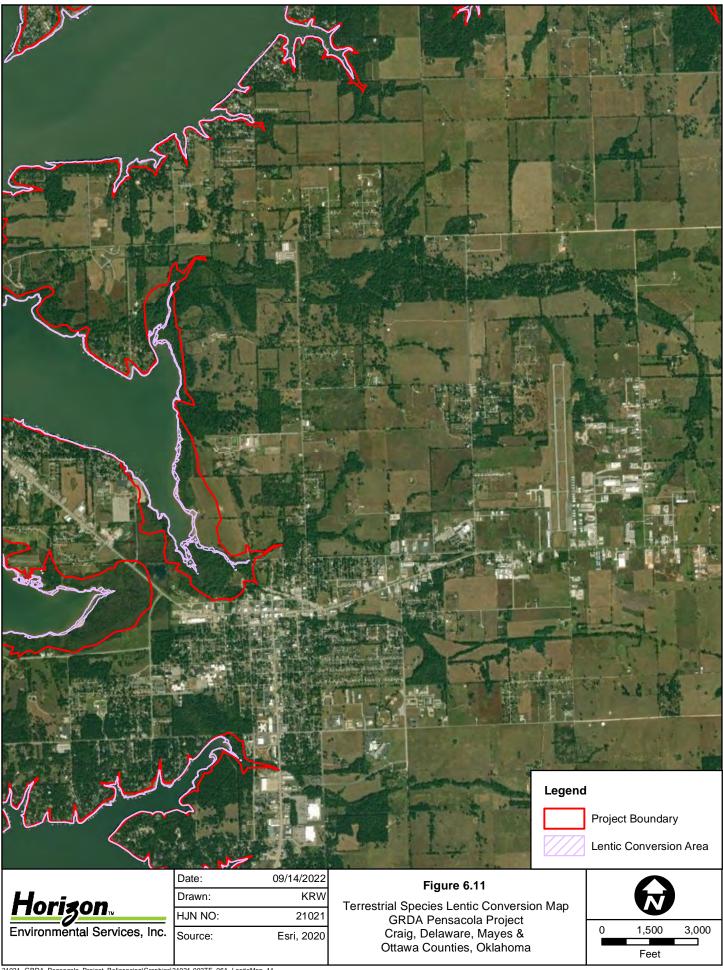


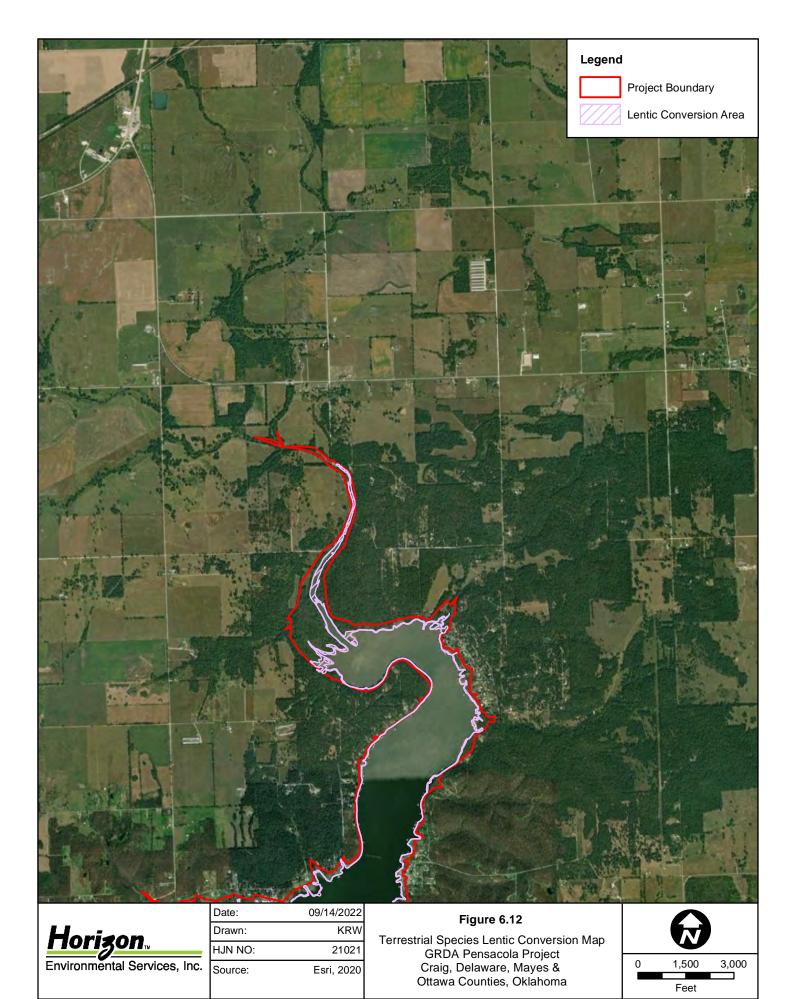


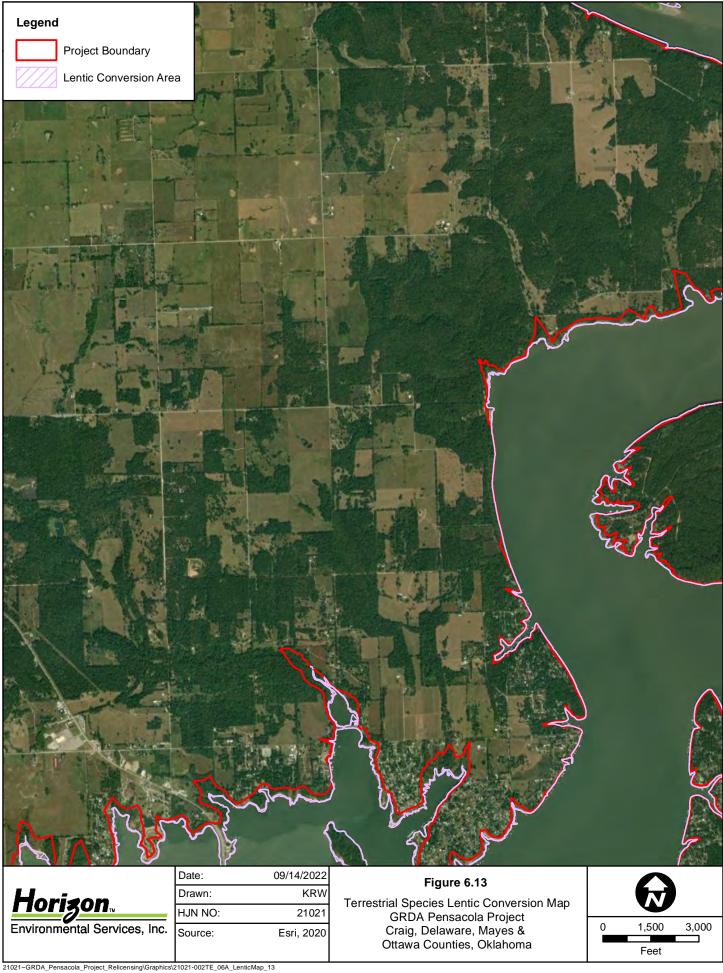


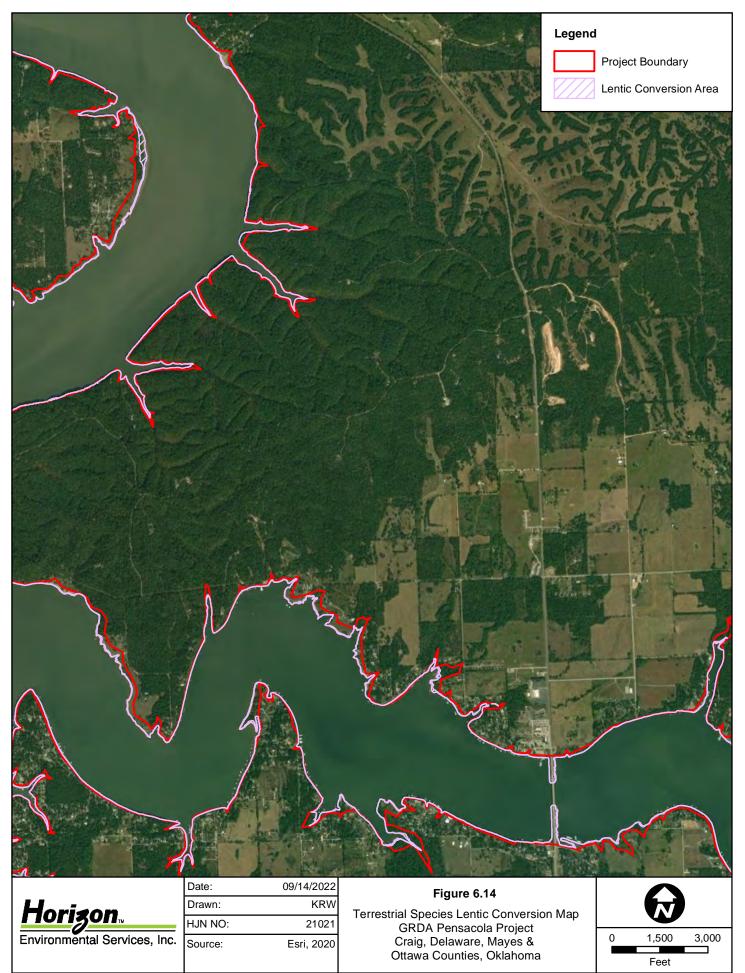


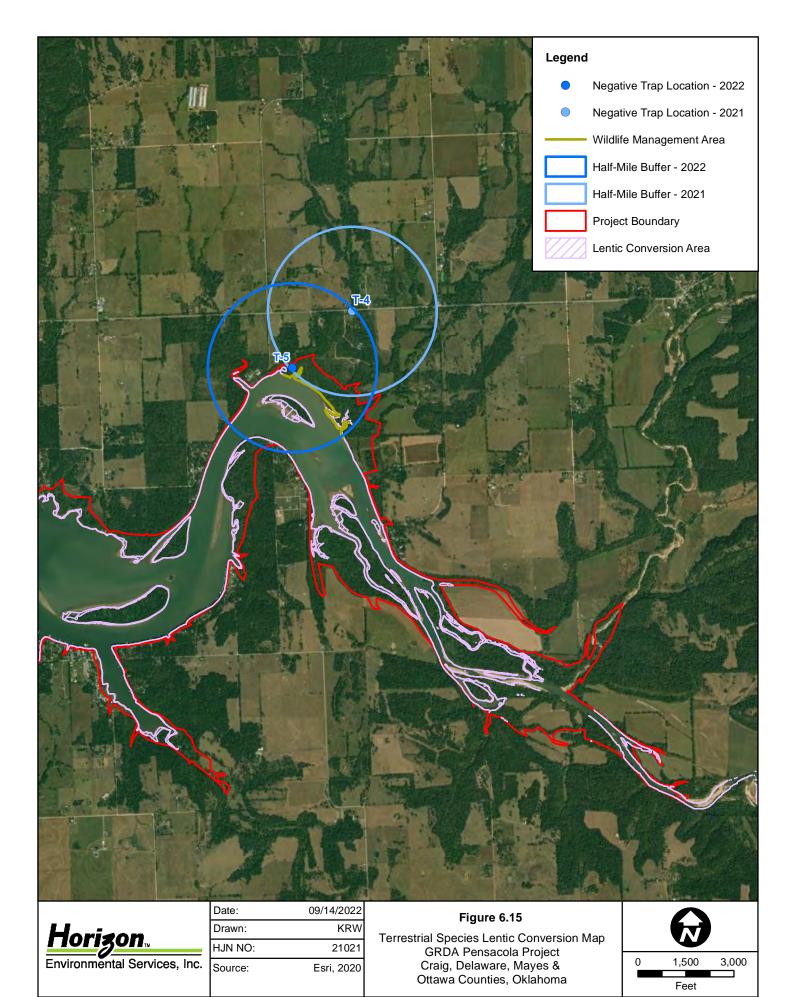


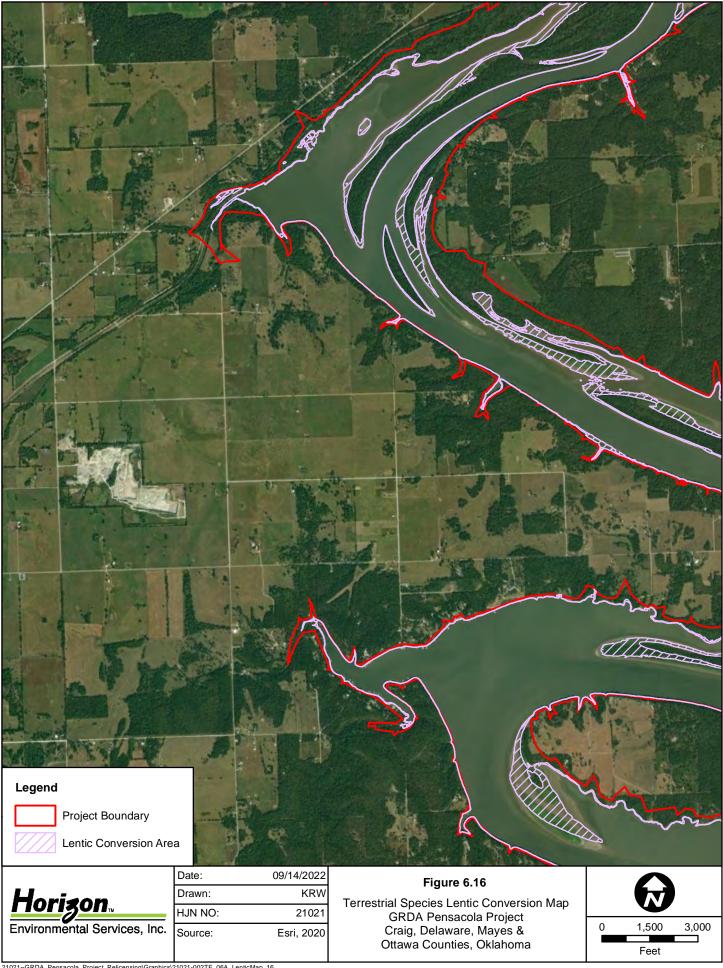


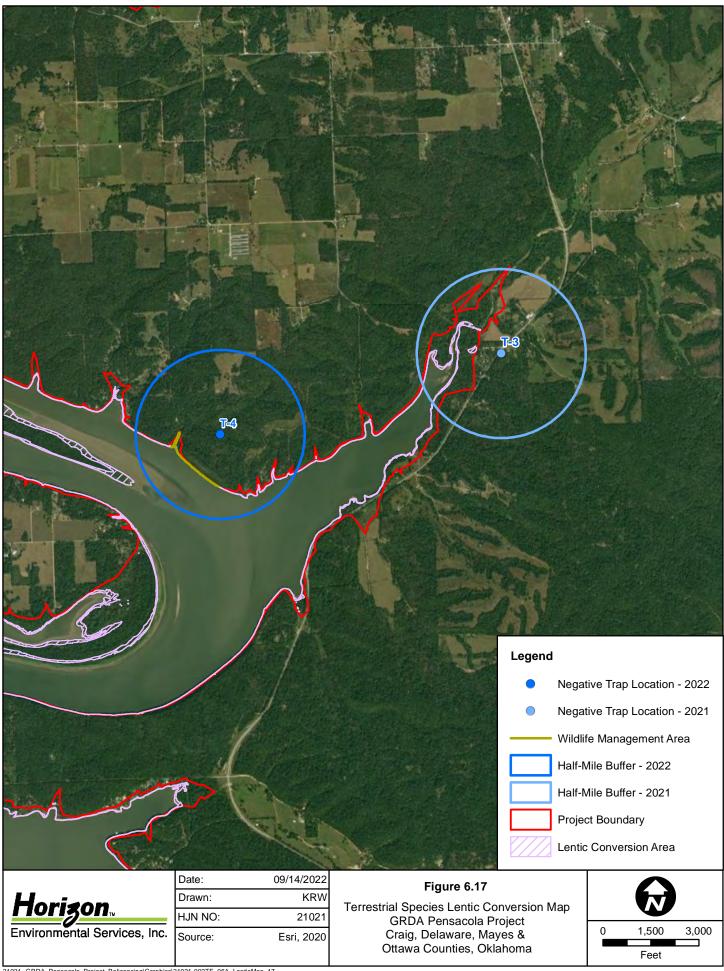


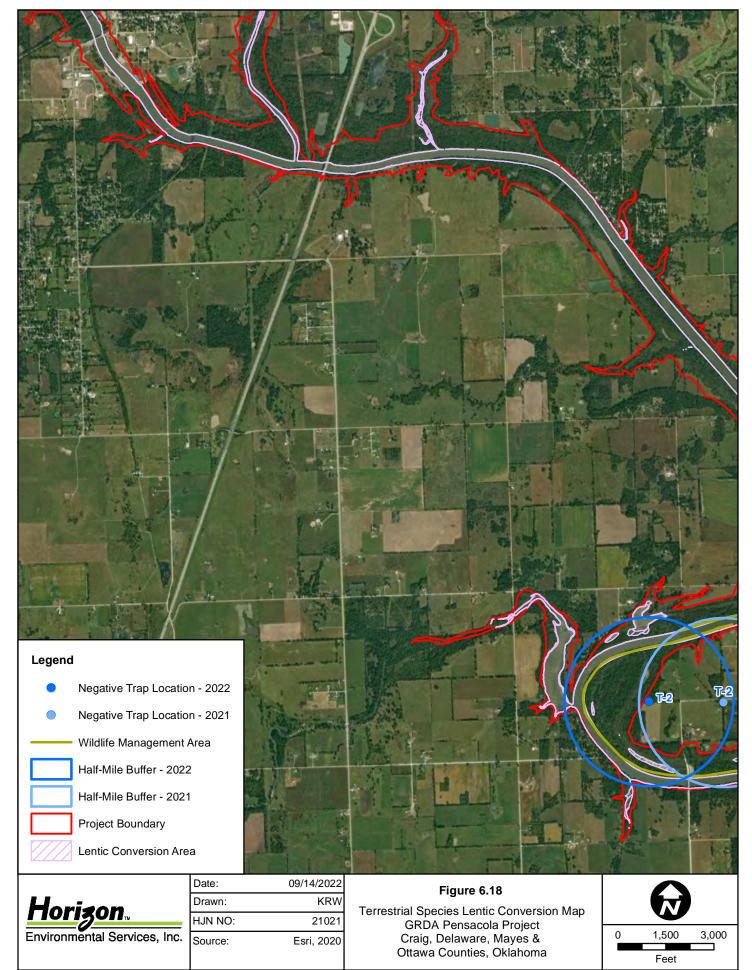


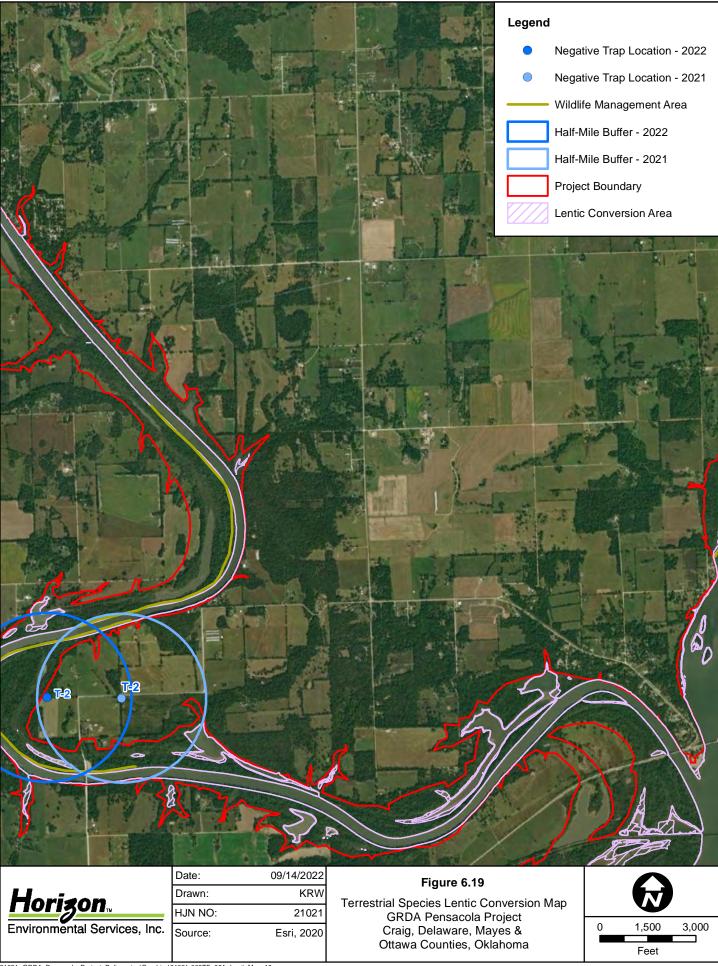


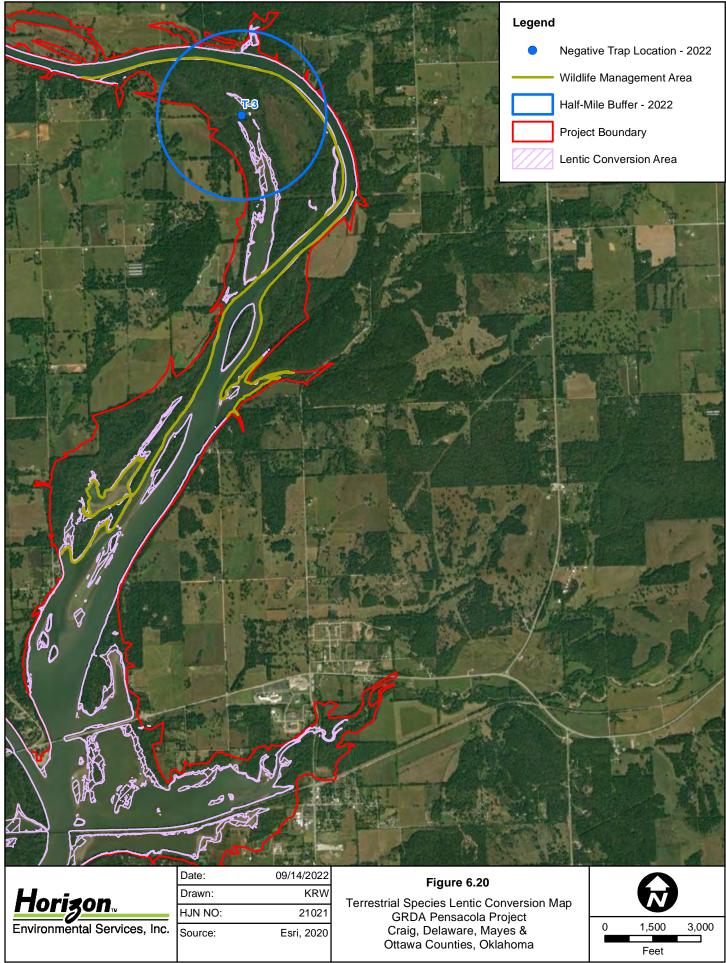


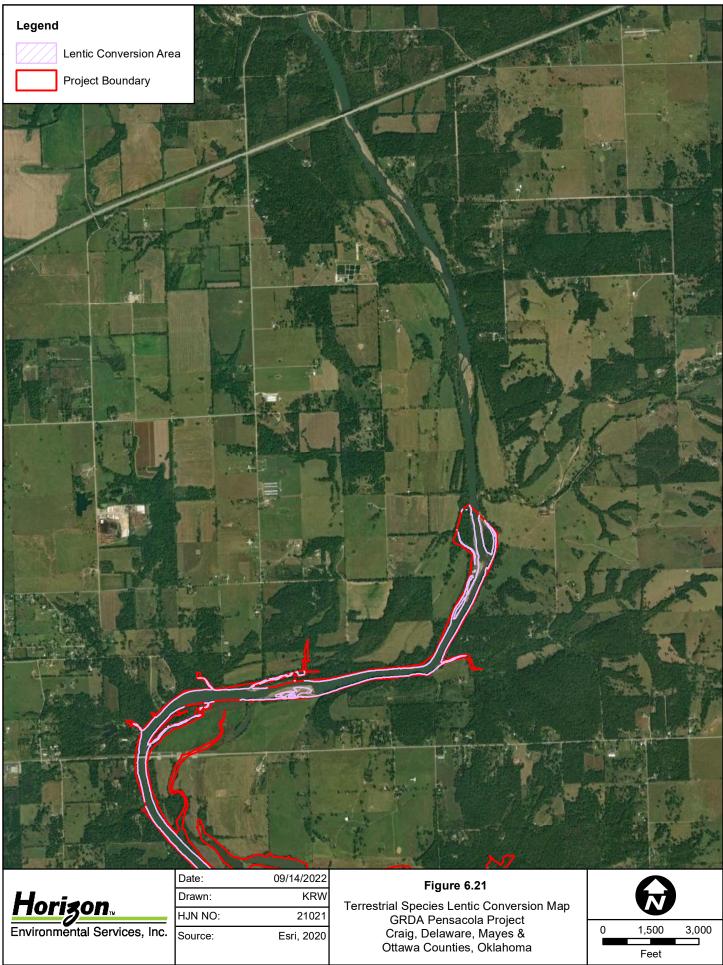


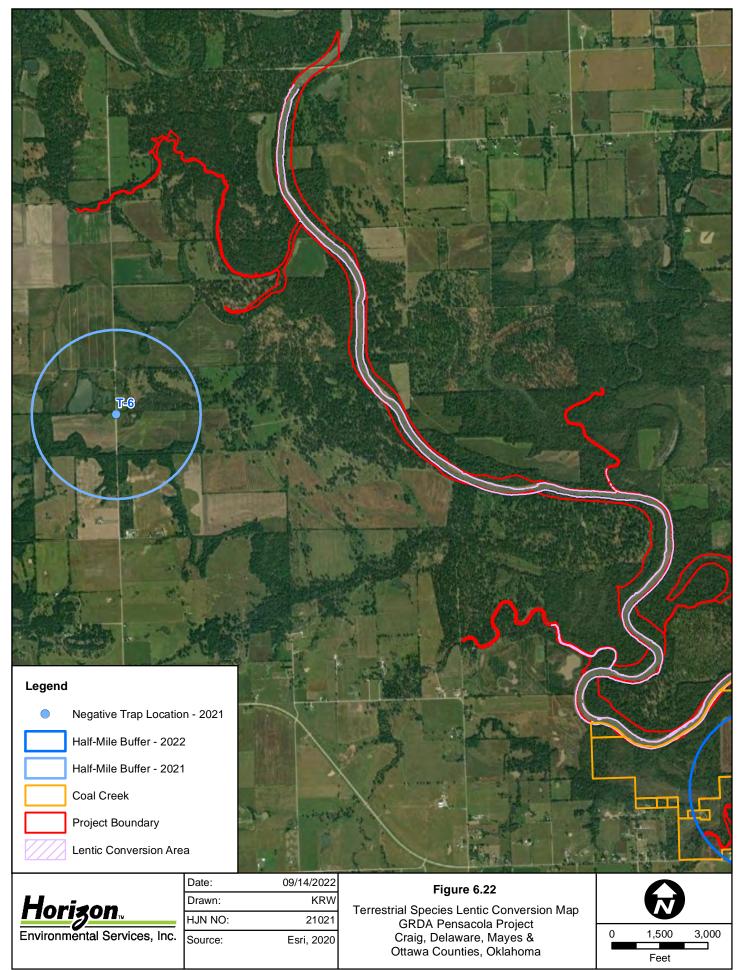


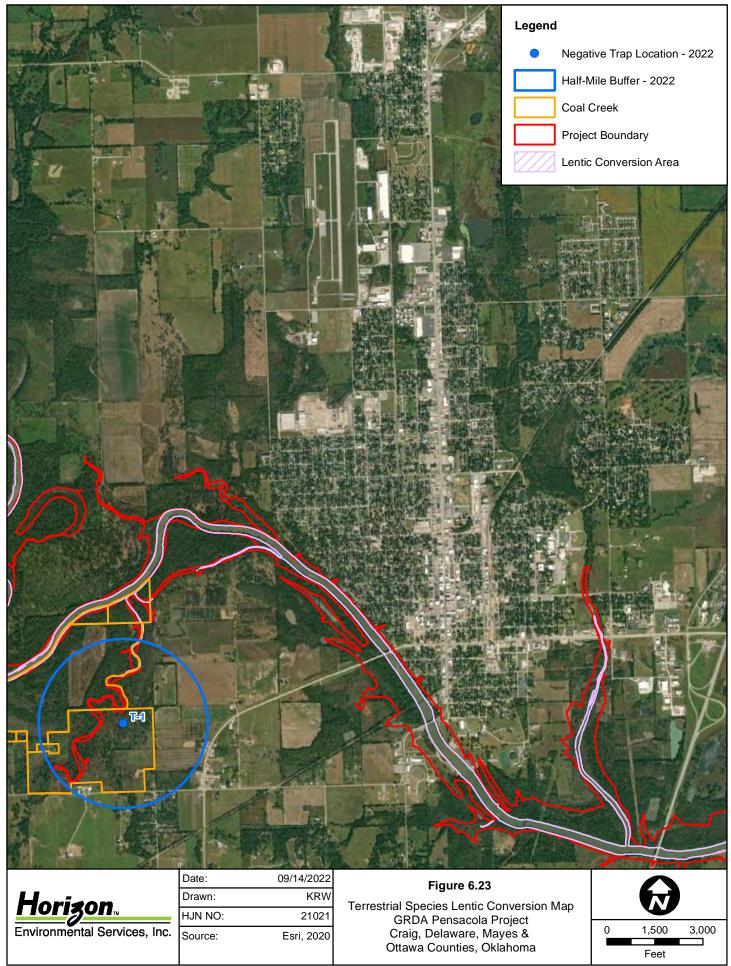


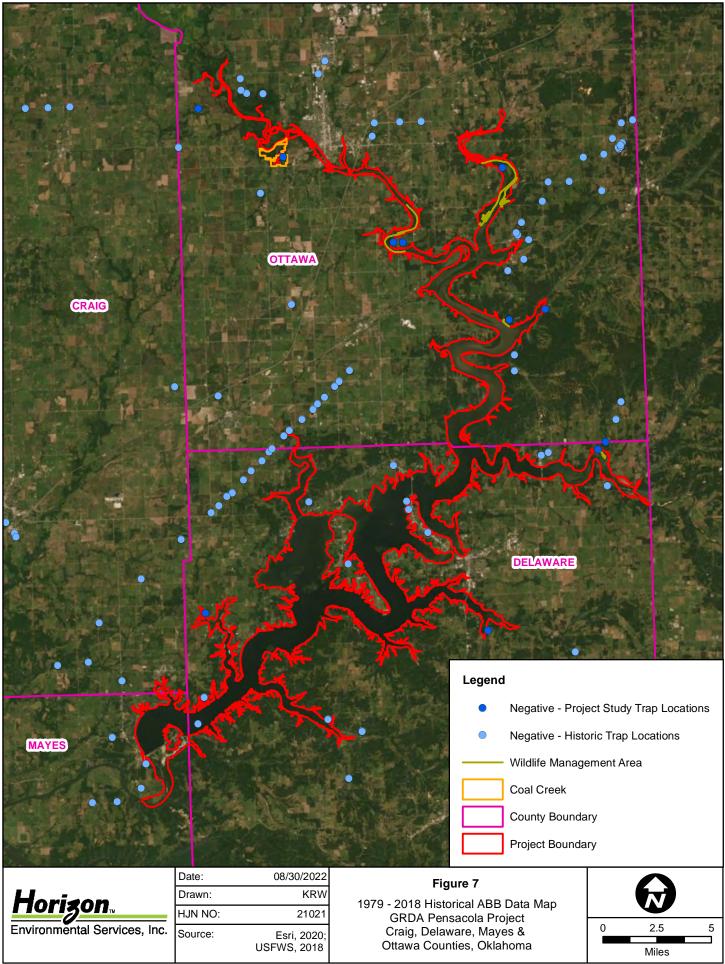












21021-GRDA_Pensacola_Project_Relicensing\Graphics\21021-001ABB_03A_Historical_Traps

APPENDIX B

American Burying Beetle Pensacola Hydroelectric Project Survey Report 2022



30 August 2022

Jacklyn Jaggars Director of Hydropower Projects Grand River Dam Authority 420 OK-28 Langley, OK 74350 918-981-8473 Office Jacklyn.Jaggars@grda.com

RE: American Burying Beetle Presence/Absence Survey for the Pensacola Hydroelectric Project (Project; FERC [Federal Energy Regulatory Commission] No. 1494); Craig, Delaware, Mayes and Ottawa Counties, Oklahoma

Dear Ms. Jaggers:

Horizon Environmental Services, Inc. (Horizon) appreciates the opportunity to provide environmental support services to the Grand River Dam Authority (GRDA) for the Pensacola Hydroelectric Project (Project; FERC [Federal Energy Regulatory Commission] No. 1494), spanning Craig, Delaware, Mayes & Ottawa Counties, Oklahoma (Project Area).

As part of the relicensing of the Pensacola Hydroelectric Project the GRDA filed a preapplication document with FERC on February 1, 2017 (GRDA 2017). The GRDA filed its Proposed Study Plan (PSP) for the relicensing on April 27, 2018 (GRDA 2018a). Also, on April 27, 2018, FERC released its Scoping Document 2 for the relicensing of the Project (FERC 2018).

In support of the relicensing effort, Horizon was contracted to conduct two years of presence/absence surveys for the American burying beetle (*Nicrophorus americanus*; ABB) to determine whether the ABB, a federally threatened species, may be present within the proposed Project Area. The Project Area is located within the ABB's current range, but outside of any conservation priority area (CPA) as defined by the US Fish and Wildlife Service (USFWS) (see attached Vicinity Map). The 2021 ABB survey was concluded in July 2021 with negative findings for all six survey locations. The 2022 ABB survey was completed in June 2022 with negative findings for all six survey locations.

On 9 June 2022, Horizon ABB Specialist Stephanie Rainwater (permit number TE-00284A) placed six (6) traps to cover a representative sample of all suitable habitat types within the Project Area (see attached Trap Maps), as well as covering the largest surface areas of potential terrestrial impact from potential water level fluctuations determined by the output from the Comprehensive Hydraulic Model (CHM) developed from as part of the Hydrologic and Hydraulic Modeling Study (H&H Study) associated with this project. The traps were designed, baited and checked following the guidelines of the *American Burying Beetle Range-wide Presence/Absence Survey Guidance* (USFWS, 2018). Trap locations were oriented in Delaware and Ottawa Counties



only, but confirmed with Kevin Stubbs, USFWS National Species Lead via email as sufficiently representative of the overall four county Project Area.

The six traps were checked daily for a total of five nights with valid weather parameters and yielded no positive ABB findings. The survey effort concluded on 14 June 2022 (see attached Data Collection Forms). The results of this survey will remain valid until the conclusion of the 2022 ABB active season. These negative survey findings indicate that the ABB is not active within the Project Area; thus, take (defined by the Endangered Species Act [ESA] as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect any threatened or endangered species") is not expected as a result of this project.

If you have any questions or concerns, please do not hesitate to contact me.

Sincerely, Hampter

Stephanie Rainwater Project Manager/Biologist (USFWS Permit Number TE-00284A) Horizon Environmental Services, Inc. 321 S. Boston Ave., Suite 300 Tulsa, OK 74103 918-219-9951 srainwater@horizon-esi.com

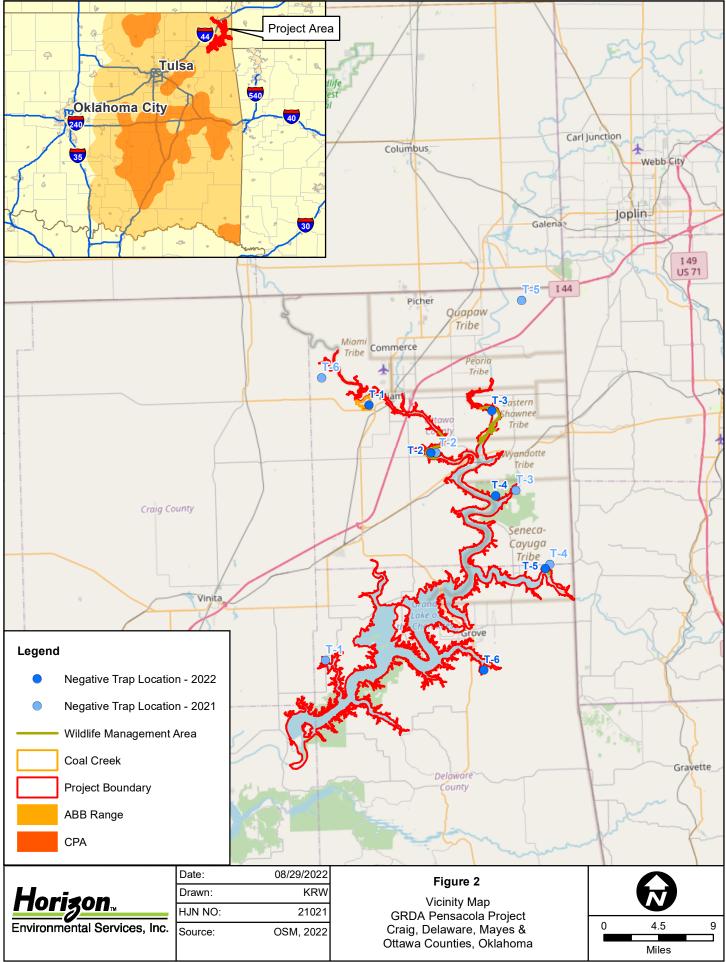
Attachments:

Maps
 Data Collection Forms

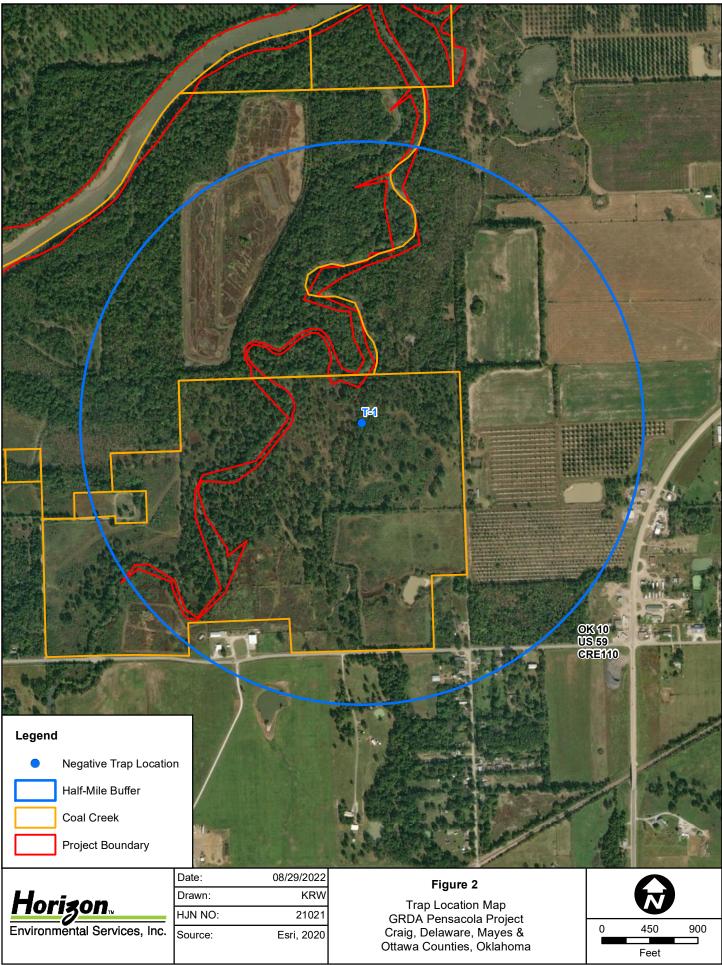


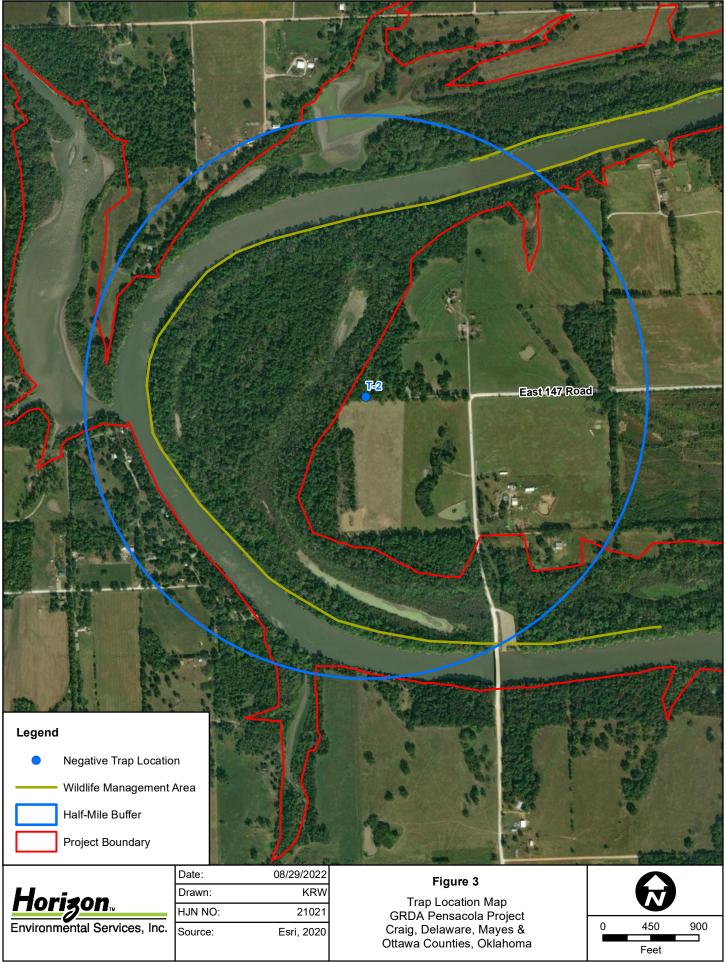
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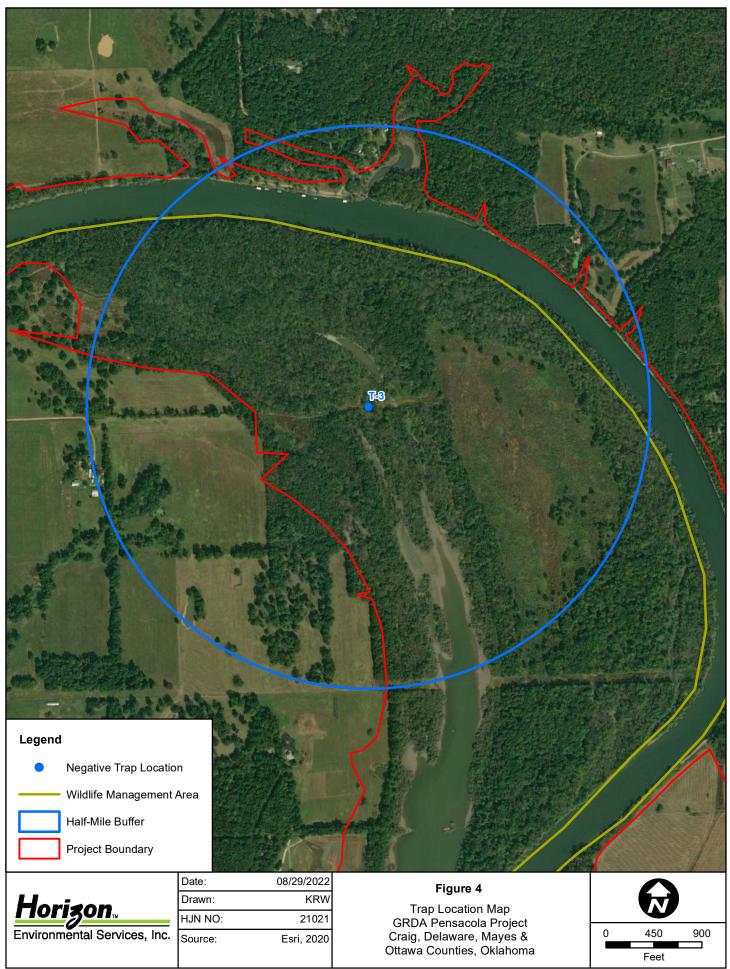
- (Esri) Environmental Systems Research Institute. World Imagery, <https://www.arcgis.com/ home/item.html?id=10df2279f9684e4a9f6a7f08febac2a9>. Imagery date 5 August 2020. Accessed 29 August 2022.
- (OSM) OpenStreetMap contributors. OpenStreetMap, http://www.openstreetmap .org>. Available under the Open Database License (www.opendatacommons.org/ licenses/odbl). Accessed 10 August 2022.
- (USFWS) US Fish and Wildlife Service. American Burying Beetle (Nicrophorus americanus) Range-wide Presence/Absence Survey Guidance, <https://www.fws.gov/southwest/ es/oklahoma/Documents/ABB/Surveying%20final/ABB%20Rangewide%20Survey% 20Guidance_Final8May2018.pdf>. Published May 2018.
- (USFWS) US Fish and Wildlife Service, Oklahoma Ecological Services Field Office. *American Burying Beetle: Additional Information*. ABB Range Map and Conservation Priority Area GIS Shapefiles, available at https://www.fws.gov/southwest/es/oklahoma/ABB_Add_Info.htm. Range Map updated 2022; CPA Map updated 2022.

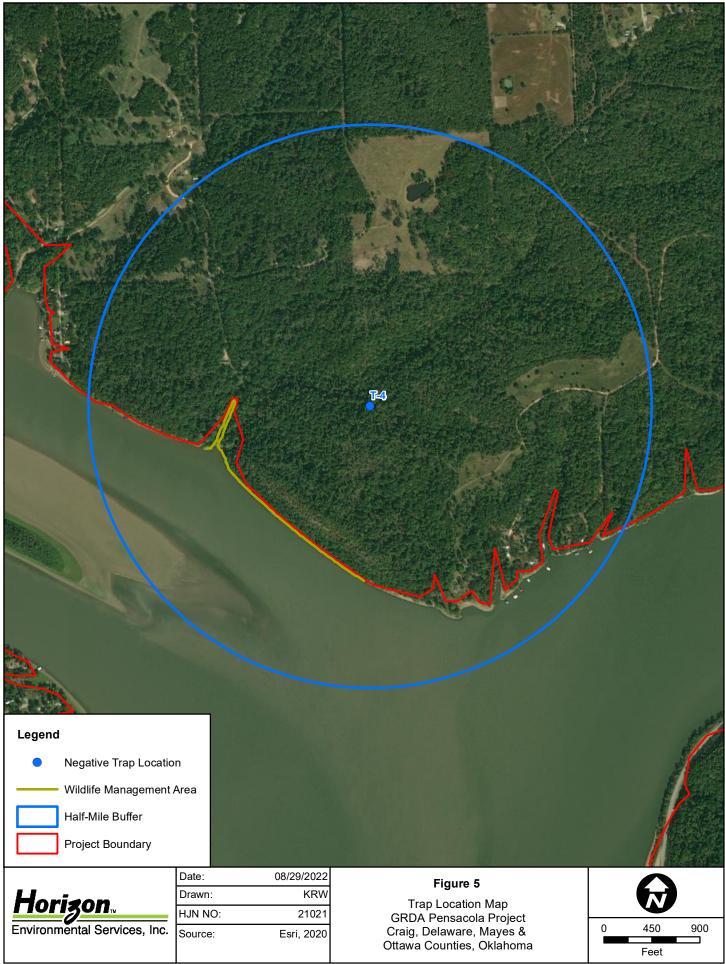


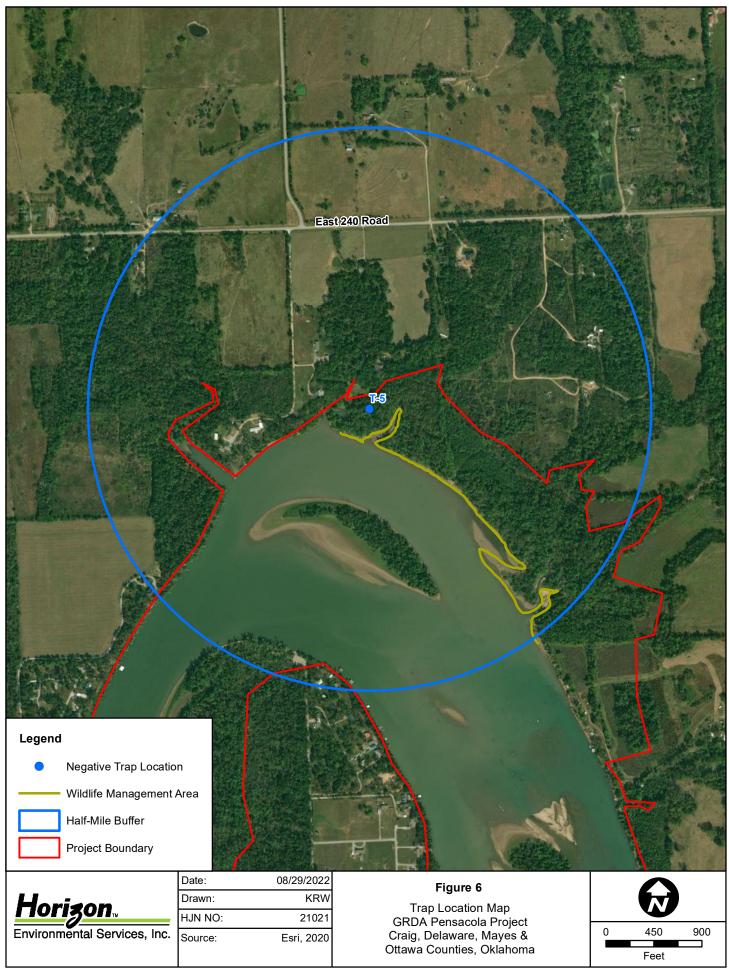
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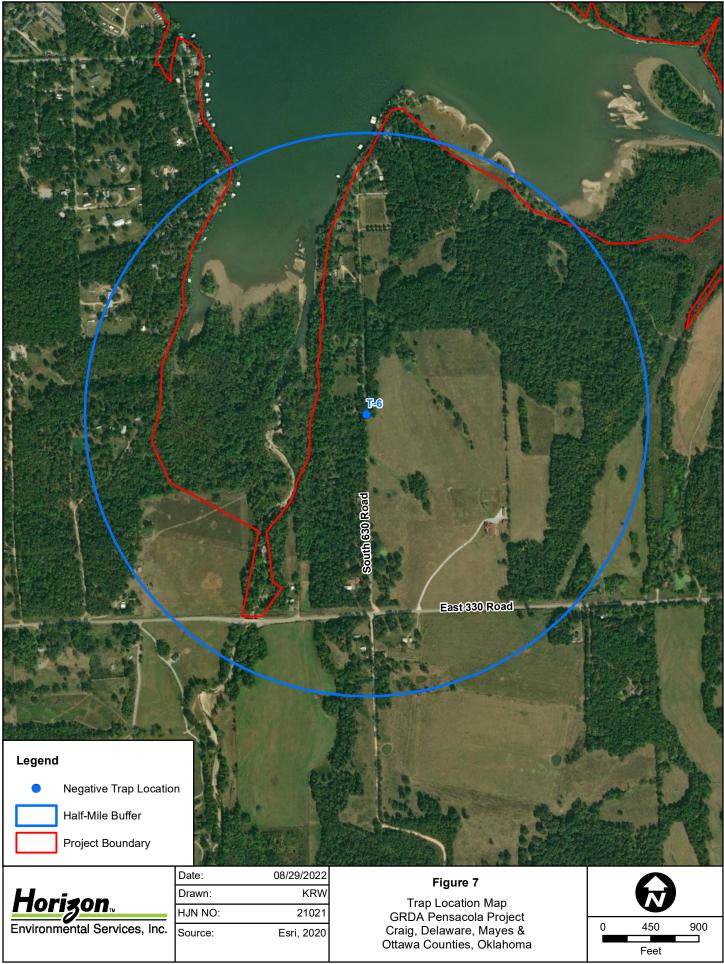












		Appendix	A: Data Co	llection Forms	*** Ame	rican Burying	Beetle Nic	rophorus ar	nericanus Pr	esence/Abse	nce Live-trappi	ng Survey G	iuidance		
		ENTER DA	TA IN COLC	R-SHADED CEI	LLS ONLY I	N CELLS THAT	REQUIRE I	DATA ENTRY	(- DO NOT E	NTER DATA I	N WHITE CELLS	OR HEADE	RROWS		
				AMERI	CAN BUR	YING BEETLI	<mark>E SURVEY</mark>	DATA CO	LLECTION F	<mark>ORM (April</mark>	2017)				
	Project Name:	Pensacola Reli	censing				No. of Trans	ects Deployed:	6			Survey Night:		1	
Р	Project Description:	Hydroelectric F	Relicensing					Trap Type:	Above Ground		C	Date Checked ¹ :		June 10, 202	2
Action A	Agency/Proponent:	Grand River Da						Bait Type:							
	Permittee:	Stephanie Rain	nwater					Trap Cover Size	24"	l			Month	Date	Year
	TE Permit #:	TE-00284A									Survey End	d Date:	June	14	2022
	Survey Company:	Horizon Enviro	nmental Servi	ces, Inc.											
							Tran Loc	ation Data							
	Tran Coor	dinatas		Legal Description					Vegetation						Weather
Trap No.	Trap Coor Latitude	Longitude	Township	Range	Section	Gen Location	County	State	Type	Priman	/ Soil Name	Soil Des	crintion	Area	Station
1	36.86497	-94.912339	28N	22E	35	Miami	Ottawa	OK	Forest		e silty clay	silt o		521	MIAM
2	36.805691	-94.823145	27N	23E	21	Wyandotte	Ottawa	OK	Forest		s silt loam	silt lo		521	MIAM
3	36.853037	-94.730515	27N	24E	4	Wyandotte	Ottawa	OK	Forest		digris complex	silt lo		521	MIAM
4	36.751592	-94.729234	26N	24E	9	Wyandotte	Ottawa	OK	Forest	Clarksville	stony silt loam	silt lo	oam	521	MIAM
								er Data							
	Daytime Temps		84.04	Survey	Period Temps		71.42		Humidity		94.13				
		(min.)	(max.)			(min.)	(max.)			(min.)	(max.)				
	Wind>10mph?6	No	1		Heavy Rain? ⁵	No	1		Soil Moisture ⁴	1.5556	1				
	winds tompilite	(Yes/No)			neavy nam:	NO			Son Worscure	1.5550					
		(163/140)													
Capt	ture Data			Nicro	phorus spe	cies			Necrophilia	Necrodes	Other	Trap Night	Time		
Trap No.	Disturbed (Y=1/N=0)	americanus	orbicollis	tomentosus	pustulatus	marginatus	carolinus	sayi	americana	surinamensis		Valid	Checked ¹ :		
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	0	0	0	0	0	0	0	Suyi O	0	0	2	(No=0/Yes=1) 1	7:00		
2	0	0	0	0	0	0	0	0	2	5	0	1	7:49		
3	0	0	0	0	0	1	0	0	0	2	3	1	7:26		
4	0	0	0	1	1	0	0	0	2	0	5	1	8:20		
Totals	0	0	0	1	1	1	0	0	4	7	10	4			
													1		
No.	of disturbed traps a	and/or bait (D):	0	1	Addition	al survey night re	quired becaus	e of weather? ⁸	0	1	# Valid Trap Nights:	4	1		
				•			-		(No=0/Yes=1)	•					
	List the in	ndividual ABB	METRICS belo	ow and complete	the approp	riate columns. Y	ou will then	COPY each ro	ow and PASTE i	nto Individual	ABB Capture Forr	n BEGINNING	at Cell A44	2 on Pg 6.	
400	Country in Trees						Female		Male	Female		Descenter	Picture		Newly
ABB Number	Caught in Trap No.	Male	Female	Unknown Sex	Male New ⁹	Male Old ⁹	New ⁹	Female Old ⁹	Unknown Age ⁹	Unknown Age ⁹	Dead	Pronotum Width (mm)	(Yes=1/No=0	Recapture ¹⁰	Marked ¹¹
Humber	140.	iviale	Ternale	UTIKITOWIT JEX	Water New	Wale Old	NCW	Tennale Old	Onknown Age	Onknown Age	Deau	widen (min)	,	necapture	Warked
Autor	mated Total	0	0	0	0	0	0	0	0	0	0	NA	0		
Commonte															
Comments:															

						RYING BEET				ORM					
Proj	ect Name:	Pensacola Reli	censing					Above Ground			Survey Night:		2		
	Description:	Hydroelectric			1		Bait Type:	Aged Chicken			Date Checked ¹ :		June 11, 202		
Action Age	ency/Proponent:	Grand River Da	am Authority		1	I	rap Cover Size	24"	l		Permittee: TE Permit #:	Ste	ephanie Rain TE-00284A		
											Survey Company:	Horizon Er	nvironmental	Services, Inc.	
						W	/eather Dat	а							
	Daytime Temps	66.79 (min.)	90.27 (max.)	Survey	Period Temps	68.36 (min.)	78.26 (max.)			62.29 (min.)	97.88 (max.)]			
			1				1		4		1				
	Wind>10mph?6	No (Yes/No)	1		Heavy Rain? ⁵	No	1		Soil Moisture ⁴	1.5619					
Gaud	Data	1		N //							0 11	Trap Night	Time	1	
	Disturbed (Y=1/N=0)	americanus	orbicollis	tomentosus	phorus spe pustulatus	marginatus	carolinus	sayi	Necrophilia americana	Necrodes surinamensis	Other	Valid	Checked ¹ :		
1	0	0	0	0	0	0	0	0	0 4	2	7	1	6:55		
2	0 0	0 0	0 0	0 1	0	0	0	0	0	2	6 8	1	7:45 7:22		
4	0	0	0	0	0	0	0	0	0	4	5	1	8:15		
Totals	0	0	0	1	0	1	0	0	4	10	26	4	j	•	
No.	of disturbed traps	and/or bait (D):	0	1	Addition	al survey night re	equired becaus	e of weather? ⁸	0		# Valid Trap Nights:	4	1		
				-		-			(No=0/Yes=1)				-		
		List the inc	dividual ABB N	METRICS below a	nd complete	the appropria	te columns. \	ou will then (COPY each row	and PASTE int	o Individual ABB	Capture Form			
ABB	Caught in Trap						Female		Male	Female		Pronotum	Picture (Yes=1/No=0		Newly
Number	No.	Male	Female	Unknown Sex	Male New ⁹	Male Old ⁹	New ⁹	Female Old ⁹	Unknown Age ⁹	Unknown Age ⁹	Dead	Width (mm))	Recapture ¹⁰	Marked ¹¹
	mated Tot.	0	0	0	0	0	0	0	0	0	0	NA	0		
Comments:													-		
				AMER	ICAN BUF		LE SURVE	<mark>' DATA CO</mark>	LLECTION F	ORM]
	ect Name:	Pensacola Reli		AMER	ICAN BUF	RYING BEETI	Trap Type:	Above Ground	LLECTION F	ORM	Survey Night:		3	2	
Project	ect Name: t Description: ency/Proponent:	Pensacola Reli Hydroelectric I Grand River Da	Relicensing	AMER	ICAN BUF		Trap Type:		LLECTION F	ORM	Date Checked ¹ : Permittee:	Ste	June 12, 202 Phanie Rain	water	
Project	Description:	Hydroelectric I	Relicensing	AMER	ICAN BUF		Trap Type: Bait Type:	Above Ground Aged Chicken	LLECTION F	ORM	Date Checked ¹ :		June 12, 202 Phanie Rain TE-002844	water	
Project	Description:	Hydroelectric I	Relicensing	AMER	ICAN BUF	Т	Trap Type: Bait Type: rap Cover Size	Above Ground Aged Chicken 24"	LLECTION F	ORM	Date Checked ¹ : Permittee: TE Permit #:		June 12, 202 Phanie Rain TE-002844	water	
Project	Description:	Hydroelectric I Grand River Da	Relicensing		Period Temps	T	Trap Type: Bait Type:	Above Ground Aged Chicken 24"	LLECTION F		Date Checked ¹ : Permittee: TE Permit #:		June 12, 202 Phanie Rain TE-002844	water	
Project	t Description: ency/Proponent:	Hydroelectric I Grand River Da	Relicensing am Authority			T	Trap Type: Bait Type: rap Cover Size	Above Ground Aged Chicken 24"			Date Checked ¹ : Permittee: TE Permit #: Survey Company:		June 12, 202 Phanie Rain TE-002844	water	
Project	t Description: ency/Proponent:	Hydroelectric I Grand River Da 77.56 (min.) No	Relicensing am Authority 93.67	Survey		T W 78.26	Trap Type: Bait Type: rap Cover Size /eather Dat 81.5	Above Ground Aged Chicken 24"		57.59	Date Checked ¹ : Permittee: TE Permit #: Survey Company: 89.56		June 12, 202 Phanie Rain TE-002844	water	
Project	EDescription: ency/Proponent: Daytime Temps	Hydroelectric I Grand River Da 77.56 (min.)	Relicensing am Authority 93.67	Survey	Period Temps	T 78.26 (min.)	Trap Type: Bait Type: rap Cover Size /eather Dat 81.5	Above Ground Aged Chicken 24"	Humidity	57.59 (min.)	Date Checked ¹ : Permittee: TE Permit #: Survey Company: 89.56	Horizon Er	June 12, 202 Phanie Rain TE-002844	water	
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				AMER	ICAN BUF	RYING BEET	LE SURVE		LLECTION	FORM					
Proj	ject Name:	Pensacola Reli	censing					Above Ground			Survey Night:		4		1
	t Description: ency/Proponent:	Hydroelectric I Grand River Da]	-		Aged Chicken 24"	1		Date Checked ¹ : Permittee:		June 13, 202 ephanie Rain		
ACTION Age	ency/Proponent.	Grand River Da	am Authority		1		rap Cover Size	24	1		TE Permit #:	50	TE-00284A		
											Survey Company:	Horizon Er	nvironmental	Services, Inc.	
						W	/eather Da	a							
	Daytime Temps	78.75 (min.)	93.22 (max.)			80.6 (min.)	85.64 (max.)		Humidity	55.13 (min.)	77.42 (max.)				
			1				1		c		1				
	Wind>10mph?6	No (Yes/No)			Heavy Rain? ⁵	No			Soil Moisture ⁴	1.6401					
Cani	ture Data	1		Nicro	phorus spe	ecies			Necrophilia	Necrodes	Other	Trap Night	Time		
Trap No.	Disturbed (Y=1/N=0)	americanus	orbicollis	tomentosus	pustulatus	marginatus	carolinus	sayi	americana	surinamensis		Valid (No=0/Yes=1)	Checked ¹ :		
1 2	0	0	1 0	0	2	0	0	0	0	4 5	3 6	1	7:10 8:00		
3	0	0	2	0	0	0 2	0	0	5	6 3	5 4	1	7:35 8:29		
4	0	0	0	1	0	2	0	0	1	3	4	1	6.29		
Totals	0	0	3	1	2	3	0	0	6	18	18	4	1		
No.	of disturbed traps	and/or bait (D):	0]	Addition	al survey night re	equired becau	e of weather? ⁸	0 (No=0/Yes=1)]	# Valid Trap Nights:	4]		
		1 Sector Sector	1		-	Alexandre		(
		List the inc	aviddai ABB N	VIETRICS DELOW a	nu complete	e the appropria		ou will then			o Individual ABB		Picture		
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)	(Yes=1/No=0)	Recapture ¹⁰	Newly Marked ¹¹
	-														
Auto	mated Tot.	0	0	0	0	0	0	0	0	0	0	NA	0		
Comments:		, ,	, î	, î	Ĵ	, ,	Ĵ	ů	, î	ů	-	101	, ,		
				AMER	ICAN BUF		LE SURVE	/ DATA CO	LLECTION I	FORM			-		
	ject Name:	Pensacola Reli	censing	AMER	ICAN BUF	RYING BEET		/ DATA CO Above Ground	LLECTION I	FORM	Survey Night:		- 5		
Project	t Description:	Hydroelectric I	Relicensing	AMER	ICAN BUF		Trap Type: Bait Type:	Above Ground Aged Chicken		FORM	Date Checked ¹ :		June 14, 202		
Project			Relicensing	AMER	ICAN BUF		Trap Type:	Above Ground	LLECTION I	FORM	Date Checked ¹ : Permittee: TE Permit #:		June 14, 202 ephanie Rain TE-00284A	water	
Project	t Description:	Hydroelectric I	Relicensing	AMER	ICAN BUF		Trap Type: Bait Type:	Above Ground Aged Chicken	LLECTION I	FORM	Date Checked ¹ : Permittee:		June 14, 202 ephanie Rain TE-00284A	water	
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Project	t Description:	Hydroelectric I Grand River Da	Relicensing		Period Temps	т	Trap Type: Bait Type: rap Cover Size	Above Ground Aged Chicken 24"	Humidity		Date Checked ¹ : Permittee: TE Permit #:		June 14, 202 ephanie Rain TE-00284A	water	
Project	t Description: ency/Proponent:	Hydroelectric I Grand River Da 78.08 (min.)	Relicensing am Authority 89.56	Survey I		T V 78.98 (min.)	Trap Type: Bait Type: rap Cover Size /eather Da 82.04	Above Ground Aged Chicken 24"		52.05	Date Checked ¹ : Permittee: TE Permit #: Survey Company: 77.04		June 14, 202 ephanie Rain TE-00284A	water	
Project	t Description: ency/Proponent: Daytime Temps	Hydroelectric I Grand River Da 78.08 (min.)	Relicensing am Authority 89.56	Survey I	Period Temps	T V 78.98 (min.)	Trap Type: Bait Type: rap Cover Size /eather Dat 82.04	Above Ground Aged Chicken 24"	Humidity	52.05 (min.)	Date Checked ¹ : Permittee: TE Permit #: Survey Company: 77.04		June 14, 202 ephanie Rain TE-00284A	water	
Project Action Age	t Description: ency/Proponent: Daytime Temps Wind>10mph?e ture Data	Hydroelectric I Grand River Da 78.08 (min.) No (Yes/No)	Relicensing am Authority 89.56 (max.)	Survey I	Period Temps Heavy Rain? ⁵ phorus spe	T 78.98 (min.) No	Trap Type: Bait Type: rap Cover Size /eather Da 82.04 (max.)	Above Ground Aged Chicken 24"	Humidity Soil Moisture ⁴	52.05 (min.) 1.8303 Necrodes	Date Checked ¹ : Permittee: TE Permit #: Survey Company: 77.04	Horizon Er	June 14, 202 ephanie Rain TE-00284A nvironmental	water	
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Project Action Age Capi Trap No. 1 2	t Description: ency/Proponent: Daytime Temps Wind>10mph?e ture Data Disturbed (v=1/x=0) 0	Hydroelectric I Grand River Da 78.08 (min.) No (Yes/No) americanus 0	Relicensing am Authority 89.56 (max.) orbicollis 0	Survey I Nicroj tomentosus 0	Period Temps Heavy Rain? ⁵ phorus spe pustulatus 0	T 78.98 (min.) No ecies marginatus 0 0	Trap Type: Bait Type: Trap Cover Size /eather Da (max.) carolinus 0 0	Above Ground Aged Chicken 24" :a sayi sayi 0 0	Humidity Soil Moisture ⁴ Necrophilia americana 0 5	52.05 (min.) 1.8303 Necrodes surinamensis 4 5	Date Checked ¹ : Permittee: TE Permit #: Survey Company: 77.04 (max.) Other 4 6	Horizon Er Trap Night Valid (No=0/Yes=1) 1	June 14, 202 ephanie Rain TE-002844 nvironmental Checked ¹ : 6:45 7:40	water	
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al Numbe	r of Traps:	6			DATA	ENTRY IS ON	LY REQUIR	ED IN DATA	BLOCK 2						
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rap No.	Disturbed (0/1)	americanus	orbicollis	tomentosus	pustulatus	marginatus	carolinus	sayi	Necrophilia	Necrodes	Other	Nights			
1	0	0	1 0	0	4	0	0	0	0 14	14 25	22 25	5			
3	0	0	2	2 5	0	3	0	0	5	15 12	31 22	5			
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Totals	0	0	3	7	7	7	0	0	26	66	100	20	1		
. of disturl	ped traps and/or ba	ait (D):	0		Addition	al survey night re	quired becau	se of weather? ⁸	0]					
						lual ABB Cap									
			COP	f the INDIVIDUA	L ABB Captu	re Data from Ni		Forms and P			W <u>BY</u> ABB Numl		Picture		
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)	(Yes=1/No=0)	Recapture ¹⁰	Newly Marked
	0	0	0	0	0	0	0	0	0	0	0	NA	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	NA	0	0	0
omments:		0	0	0	0	0	0	0	0	0	0	NA	0	0	0
omments:	r of Traps:	1		!!!!!!DO N	OT ENTER A	ANY DATA IN	THIS DATA	BLOCK!!!!!				NA	0	0	0
omments:	r of Traps:	1			OT ENTER A	ANY DATA IN	THIS DATA	BLOCK!!!!!					0	0	0
omments: otal Numbe	r of Traps: BLOCK	1 <mark>3 - Total AB</mark>	B Capture D	IIIIIDO No Pata by Trap / 1	OT ENTER A	ANY DATA IN Data from TH	THIS DATA IS BLOCK a Female	BLOCK!!!!! utopopulate	es into the Su Male	urvey Summa Female	ry Form	Total Trap/Bait		Newly	0
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Trap No. 1 2 3 4 0 0 0 0 0 0 0 0 0 0 0 0 0	r of Traps: BLOCK Total ABB 0 0 0 0 0 0 0 0 0 0 0 0 0	1 3 - Total AB 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	B Capture D 0 <td< td=""><td>IIIIIDO N vata by Trap / Unknown Sex 0 vor should complexe</td><td>DT ENTER A Transect - I Male New⁹ 0 57.59 55.13 52.05 0 0 0 0</td><td>ANY DATA IN Data from TH Male Old⁹ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>THIS DATA IS BLOCK a New⁹ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>BLOCK!!!!! utopopulate Female Old⁹ 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>es into the Su Male Unknown Age⁹ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>Female Unknown Age⁹ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>ry Form 0 0 0 0 0 0 0 0 0 11S BLOCK</td><td>Total Trap/Bait Disturbed 0 0 0 0 0 0 0 0 0 0 0</td><td>Recapture³⁴ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>Newly Marked¹¹ 0 0 0 0 0 0 0 0 0 0 0</td><td>0</td></td<>	IIIIIDO N vata by Trap / Unknown Sex 0 vor should complexe	DT ENTER A Transect - I Male New ⁹ 0 57.59 55.13 52.05 0 0 0 0	ANY DATA IN Data from TH Male Old ⁹ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	THIS DATA IS BLOCK a New ⁹ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	BLOCK!!!!! utopopulate Female Old ⁹ 0 0 0 0 0 0 0 0 0 0 0 0 0	es into the Su Male Unknown Age ⁹ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Female Unknown Age ⁹ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ry Form 0 0 0 0 0 0 0 0 0 11S BLOCK	Total Trap/Bait Disturbed 0 0 0 0 0 0 0 0 0 0 0	Recapture ³⁴ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Newly Marked ¹¹ 0 0 0 0 0 0 0 0 0 0 0	0
omments: batal Number Trap No. 1 2 3 4 0 0 0 0 0 0 0 0 0 0 0 0 0	r of Traps: BLOCK Total ABB 0 0 0 0 0 0 0 0 0 0 0 0 0	1 3 - Total AB Male 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	B Capture D 0 <td< td=""><td>IIIIIDO N ata by Trap / Unknown Sex 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>DT ENTER A Transect - I Male New⁹ 0 57.59 55.13 52.05 0 0 0 0</td><td>ANY DATA IN Data from TH Male Old⁹ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>THIS DATA IS BLOCK a New⁹ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>BLOCK!!!!! utopopulate Female Old⁹ 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>es into the Su Male Unknown Age⁹ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>Female Unknown Age⁹ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>ry Form 0 0 0 0 0 0 0 0 0 11S BLOCK</td><td>Total Trap/Bait Disturbed 0 0 0 0 0 0 0 0 0 0 0</td><td>Recapture³⁴ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>Newly Marked¹¹ 0 0 0 0 0 0 0 0 0 0 0</td><td>0</td></td<>	IIIIIDO N ata by Trap / Unknown Sex 0 0 0 0 0 0 0 0 0 0 0 0 0	DT ENTER A Transect - I Male New ⁹ 0 57.59 55.13 52.05 0 0 0 0	ANY DATA IN Data from TH Male Old ⁹ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	THIS DATA IS BLOCK a New ⁹ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	BLOCK!!!!! utopopulate Female Old ⁹ 0 0 0 0 0 0 0 0 0 0 0 0 0	es into the Su Male Unknown Age ⁹ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Female Unknown Age ⁹ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ry Form 0 0 0 0 0 0 0 0 0 11S BLOCK	Total Trap/Bait Disturbed 0 0 0 0 0 0 0 0 0 0 0	Recapture ³⁴ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Newly Marked ¹¹ 0 0 0 0 0 0 0 0 0 0 0	0
Trap No. 1 2 3 4 0 0 0 0 0 0 0 0 0 0 0 0 0	r of Traps: BLOCK Total ABB 0 0 0 0 0 0 0 0 0 0 0 0 0	1 3 - Total AB Male 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	B Capture D Female 0	IIIIIDO Nu ata by Trap / Unknown Sex 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	OT ENTER A Transect - I Male New ² 0 0 0 0 0 0 0 0 0 0 0 0 0	ANY DATA IN Data from TH Male Old ⁹ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	THIS DATA IS BLOCK a Female New ⁹ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	BLOCK!!!!! utopopulate Female Old ⁹ 0 0 0 0 0 0 0 0 0 0 0 0 0	es into the Su Male Unknown Age ⁹ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Female Unknown Age ⁹ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ry Form 0 0 0 0 0 0 0 0 0 11S BLOCK	Total Trap/Bait Disturbed 0 0 0 0 0 0 0 0 0 0 0	Recapture ³⁴ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Newly Marked ¹¹ 0 0 0 0 0 0 0 0 0 0 0	0
Trap No. 1 2 3 4 0 0 0 0 0 0 0 0 0 0 0 0 0	r of Traps: BLOCK Total ABB 0 0 0 0 0 0 0 0 0 0 0 0 0	1 3 - Total AB 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	B Capture D Female 0	IIIIIDO NU ata by Trap / Unknown Sex 0 <td>OT ENTER A Transect - I Male New² 0 57.59 55.13 52.05 0<td>ANY DATA IN Data from TH Male Old⁹ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>THIS DATA IS BLOCK a Female New⁹ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>BLOCK!!!!! utopopulate Female Old⁹ 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>es into the Su Male Unknown Age⁹ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>Female Unknown Age⁹ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>ry Form 0 0 0 0 0 0 0 0 0 11S BLOCK</td><td>Total Trap/Bait Disturbed 0 0 0 0 0 0 0 0 0 0 0</td><td>Recapture³⁴ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>Newly Marked¹¹ 0 0 0 0 0 0 0 0 0 0 0</td><td>0</td></td>	OT ENTER A Transect - I Male New ² 0 57.59 55.13 52.05 0 <td>ANY DATA IN Data from TH Male Old⁹ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td> <td>THIS DATA IS BLOCK a Female New⁹ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td> <td>BLOCK!!!!! utopopulate Female Old⁹ 0 0 0 0 0 0 0 0 0 0 0 0 0</td> <td>es into the Su Male Unknown Age⁹ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td> <td>Female Unknown Age⁹ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td> <td>ry Form 0 0 0 0 0 0 0 0 0 11S BLOCK</td> <td>Total Trap/Bait Disturbed 0 0 0 0 0 0 0 0 0 0 0</td> <td>Recapture³⁴ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td> <td>Newly Marked¹¹ 0 0 0 0 0 0 0 0 0 0 0</td> <td>0</td>	ANY DATA IN Data from TH Male Old ⁹ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	THIS DATA IS BLOCK a Female New ⁹ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	BLOCK!!!!! utopopulate Female Old ⁹ 0 0 0 0 0 0 0 0 0 0 0 0 0	es into the Su Male Unknown Age ⁹ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Female Unknown Age ⁹ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ry Form 0 0 0 0 0 0 0 0 0 11S BLOCK	Total Trap/Bait Disturbed 0 0 0 0 0 0 0 0 0 0 0	Recapture ³⁴ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Newly Marked ¹¹ 0 0 0 0 0 0 0 0 0 0 0	0
rap No. 1 2 3 4 0 0 0 0 0 0 0 0 0 0 0 0 0	r of Traps: BLOCK Total ABB 0 0 0 0 0 0 0 0 0 0 0 0 0	1 3 - Total AB 0 93.27 93.67 93.56 0 <tr< td=""><td>Female 0</td><td>IIIIIDO Nu ata by Trap / Unknown Sex 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>OT ENTER A Transect - I Male New⁹ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 52.05 0 <!--</td--><td>MAY DATA IN Data from TH Male Old⁹ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>THIS DATA IS BLOCK a Female New⁹ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>BLOCK!!!!! utopopulate Female Old⁹ 0 0 0 0 0 0 0 0 0 0 ary - NO DAT</td><td>A series of the series of the</td><td>Female Unknown Age⁹ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>ry Form 0 0 0 0 0 0 0 0 0 11S BLOCK</td><td>Total Trap/Bait Disturbed 0 0 0 0 0 0 0 0 0 0 0</td><td>Recapture³⁴ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>Newly Marked¹¹ 0 0 0 0 0 0 0 0 0 0 0</td><td>0</td></td></tr<>	Female 0	IIIIIDO Nu ata by Trap / Unknown Sex 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	OT ENTER A Transect - I Male New ⁹ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 52.05 0 </td <td>MAY DATA IN Data from TH Male Old⁹ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td> <td>THIS DATA IS BLOCK a Female New⁹ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td> <td>BLOCK!!!!! utopopulate Female Old⁹ 0 0 0 0 0 0 0 0 0 0 ary - NO DAT</td> <td>A series of the series of the</td> <td>Female Unknown Age⁹ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td> <td>ry Form 0 0 0 0 0 0 0 0 0 11S BLOCK</td> <td>Total Trap/Bait Disturbed 0 0 0 0 0 0 0 0 0 0 0</td> <td>Recapture³⁴ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td> <td>Newly Marked¹¹ 0 0 0 0 0 0 0 0 0 0 0</td> <td>0</td>	MAY DATA IN Data from TH Male Old ⁹ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	THIS DATA IS BLOCK a Female New ⁹ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	BLOCK!!!!! utopopulate Female Old ⁹ 0 0 0 0 0 0 0 0 0 0 ary - NO DAT	A series of the	Female Unknown Age ⁹ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ry Form 0 0 0 0 0 0 0 0 0 11S BLOCK	Total Trap/Bait Disturbed 0 0 0 0 0 0 0 0 0 0 0	Recapture ³⁴ 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Newly Marked ¹¹ 0 0 0 0 0 0 0 0 0 0 0	0

											nce Live-trappi				
		ENTER DA	TA IN COLO	R-SHADED CE	LLS ONLY II	N CELLS THAT	REQUIRE	DATA ENTRY	/ - DO NOT E	NTER DATA I	N WHITE CELLS	OR HEADE	RROWS		
				AMERI	CAN BUR	YING BEETL	<mark>E SURVEY</mark>	DATA COI	LLECTION F	ORM (April	2017)				
	Project Name:	Pensacola Reli	-				No. of Trans	ects Deployed:	6			Survey Night:		1	
	Project Description:	Hydroelectric F						Trap Type:	Above Ground		C	ate Checked ¹ :		June 10, 202	2
Action A	Agency/Proponent:	Grand River Da						Bait Type:	Aged Chicken				Manth	Data	Veee
	Permittee: TE Permit #:	Stephanie Rair TE-00284A	iwater					Frap Cover Size	24"	l	Survey End	Data	Month June	Date 14	Year 2022
	Survey Company:		nmental Servio	ces, Inc.	1						Survey Lin	Date.	Julie	14	2022
					1										
	_						Trap Loca	ation Data				_			
	Trap Coor			Legal Description					Vegetation						Weather
Trap No.	Latitude	Longitude	Township	Range	Section	Gen Location	County	State	Туре		y Soil Name	Soil Des		Area	Station
<u>5</u>	36.663097 36.5446	<u>-94.659122</u> -94.75535	25N 24N	25E 24E	7 20	Turkey Ford Jay	Delaware Delaware	OK OK	Forest Mixed		g silt loam er silt loam	silt lo silt lo		521 521	JAYX JAYX
0	30.5440	-94.75555	2411	246	20	Jay	Delaware	UK	WINEU	Diftwat		Silt it	Jain	521	JAIA
-															
							Weath	er Data							
	Daytime Temps	65.05	82.4	Survey	Period Temps	65.3	68.36			-996	-996	1			
	,	(min.)	(max.)			(min.)	(max.)			(min.)	(max.)	1			
	Wind>10mph?6	No			Heavy Rain? ⁵	No			Soil Moisture ⁴	1.4622					
		(Yes/No)													
Cant	ture Data			Nicro	ohorus spe	cies			Necrophilia	Necrodes	Other	Trap Night	Time		
Trap No.	Disturbed (Y=1/N=0)	americanus	orbicollis	tomentosus	pustulatus	marginatus	carolinus	a an st	1	surinamensis	other	Valid	Checked ¹ :		
1rap No. 5	0	americanus 0	2	o comentosus	1	marginatus 0	carolinus 0	sayi 0	americana 5	18	3	(No=0/Yes=1) 1	9:00		
6	0	0	0	0	0	0	0	0	2	5	5	1	9:30		
							-			-					
-															
Totals	0	0	2	0	1	0	0	0	7	23	8	2	l		
No	of disturbed traps	and/or bait (D)	0	1	Addition	al survey night re	nuired becaus	e of weather? ⁸	0	1	# Valid Trap Nights:	2	1		
		and/or bait (b).		1	/ during in	an survey mgneres	quireu beccuus	c or meditier.	(No=0/Yes=1)	1	, vala riap rigres.		1		
	List the in	ndividual ABB	METRICS belo	w and complete	the approp	riate columns. Y	ou will then	COPY each ro	ow and PASTE i	into Individual	ABB Capture Forr	n BEGINNING	at Cell A44	2 on Pg 6.	
ABB	Caught in Trap						Female		Male	Female		Pronotum	Picture (Yes=1/No=0		Newly
Number	No.	Male	Female	Unknown Sex	Male New ⁹	Male Old ⁹	New ⁹	Female Old ⁹	Unknown Age ⁹	Unknown Age ⁹	Dead	Width (mm)	(162=1/NO=0)	Recapture ¹⁰	Marked ¹¹
									Ŭ	Ŭ		. ,			
Autor	mated Total	0	0	0	0	0	0	0	0	0	0	NA	0		
Comments:															
Comments.															

															1
Proi	ject Name:	Pensacola Reli	censing	AIVIEN				Above Ground	1		Survey Night:		2		
Projec	t Description:	Hydroelectric	Relicensing		1		Bait Type:	Aged Chicken			Date Checked ¹ :		June 11, 202		
Action Ag	ency/Proponent:	Grand River Da	am Authority]	Т	rap Cover Size	24"	l		Permittee: TE Permit #:	Ste	ephanie Rain TE-002844		
											Survey Company:	Horizon Er		Services, Inc.	
						w	/eather Dat	а							
	Daytime Temps	67.08	89.19	Survey	Period Temps	68.36	73.04	-	Humidity		-996	I			
		(min.)	(max.)			(min.)	(max.)			(min.)	(max.)				
	Wind>10mph?6]		Heavy Rain? ⁵	No]		Soil Moisture ⁴	1.4573					
		(Yes/No)													
	ture Data				phorus spe		-		Necrophilia	Necrodes	Other	Trap Night Valid	Time		
Trap No. 5	Disturbed (Y=1/N=0)	americanus 0	orbicollis 4	tomentosus 0	pustulatus 4	marginatus 0	carolinus 0	sayi 0	americana 6	surinamensis 25	5	(No=0/Yes=1) 1	Checked ¹ : 9:05		
6	0	0	0	1	0	0	0	0	3	4	3	1	9:37		
								-		20					
Totals	0	0	4	1	4	0	0	0	9	29	8	2	1		
No.	of disturbed traps	and/or bait (D):	0]	Addition	al survey night re	equired becaus	e of weather? ⁸]	# Valid Trap Nights:	2]		
									(No=0/Yes=1)						
		List the inc	dividual ABB I	METRICS below a	ind complete	the appropria	te columns. \	ou will then (COPY each row	and PASTE int	o Individual ABB	Capture Form			
ABB	Caught in Trap						Female	^	Male	Female		Pronotum	Picture (Yes=1/No=0		Newly
Number	No.	Male	Female	Unknown Sex	Male New ⁹	Male Old ⁹	New ⁹	Female Old ⁹	Unknown Age ⁹	Unknown Age ⁹	Dead	Width (mm))	Recapture ¹⁰	Marked ¹¹
	I omated Tot.	0	0	0	0	0	0	0	0	0	0	NA	0		
Comments:													-		
				AMER	ICAN BUR		LE SURVE	OATA CO	LLECTION F	ORM					
Proj	ject Name:	Pensacola Reli	censing	AMER	ICAN BUF	YING BEET		DATA CO Above Ground	LLECTION F	ORM	Survey Night:		3		
Projec	t Description:	Hydroelectric	Relicensing	AMER	ICAN BUF		Trap Type: Bait Type:	Above Ground Aged Chicken	LLECTION F	ORM	Date Checked ¹ :		June 12, 202		
Projec			Relicensing	AMER	ICAN BUF		Trap Type:	Above Ground	LLECTION F	ORM	Date Checked ¹ : Permittee: TE Permit #:		June 12, 202 Phanie Rain TE-002844	water A	
Projec	t Description:	Hydroelectric	Relicensing	AMER	ICAN BUF		Trap Type: Bait Type:	Above Ground Aged Chicken		ORM	Date Checked ¹ : Permittee:		June 12, 202 Phanie Rain TE-002844	water	
Projec	t Description:	Hydroelectric	Relicensing	AMER	ICAN BUF	Т	Trap Type: Bait Type:	Above Ground Aged Chicken 24"	LLECTION F	ORM	Date Checked ¹ : Permittee: TE Permit #:		June 12, 202 Phanie Rain TE-002844	water A	
Projec	t Description:	Hydroelectric I Grand River Da 77.29	Relicensing am Authority 93.27	AMER	ICAN BUF	T W 77.9	Trap Type: Bait Type: rap Cover Size /eather Dat 80.6	Above Ground Aged Chicken 24"	LLECTION F	-996	Date Checked ¹ : Permittee: TE Permit #: Survey Company: - 996		June 12, 202 Phanie Rain TE-002844	water A	
Projec	t Description: ency/Proponent: Daytime Temps	Hydroelectric I Grand River D 77.29 (min.)	Relicensing am Authority]	}	T 77.9 (min.)	Trap Type: Bait Type: rap Cover Size	Above Ground Aged Chicken 24"	Humidity	-996 (min.)	Date Checked ¹ : Permittee: TE Permit #: Survey Company:		June 12, 202 Phanie Rain TE-002844	water A	
Projec	t Description: ency/Proponent:	Hydroelectric I Grand River D 77.29 (min.)	Relicensing am Authority 93.27]	Heavy Rain? ⁵	T W 77.9	Trap Type: Bait Type: rap Cover Size /eather Dat 80.6	Above Ground Aged Chicken 24"		-996	Date Checked ¹ : Permittee: TE Permit #: Survey Company: - 996		June 12, 202 Phanie Rain TE-002844	water A	
Projec Action Age	t Description: ency/Proponent: Daytime Temps Wind>10mph?6	Hydroelectric I Grand River D 77.29 (min.)	Relicensing am Authority 93.27	J	Heavy Rain? ⁵	T 77.9 (min.) No	Trap Type: Bait Type: rap Cover Size /eather Dat 80.6	Above Ground Aged Chicken 24"	Humidity Soil Moisture ⁴	-996 (min.) 1.5315	Date Checked ¹ : Permittee: TE Permit #: Survey Company: -996 (max.)	Horizon Er	June 12, 202 ephanie Rain TE-00284A wironmental	water A	
Projec Action Age	t Description: ency/Proponent: Daytime Temps	Hydroelectric I Grand River D: 77.29 (min.) No (Yes/No)	Relicensing am Authority 93.27	J	Heavy Rain? ⁵	T (min.) No eccies	Trap Type: Bait Type: rap Cover Size /eather Dat 80.6	Above Ground Aged Chicken 24"	Humidity	-996 (min.)	Date Checked ¹ : Permittee: TE Permit #: Survey Company: - 996	Horizon Er	June 12, 202 Phanie Rain TE-002844	water A	
Projec Action Ag Cap Trap No. 5	t Description: ency/Proponent: Daytime Temps Wind>10mph?6 ture Data Disturbed (v=1/w=0) 0	Hydroelectric I Grand River D: 77.29 (min.) No (Yes/No) americanus 0	Relicensing am Authority 93.27 (max.)] orbicollis 3	Nicroj tomentosus 0	Heavy Rain? ⁵	T 77.9 (min.) No ecies marginatus 0	Trap Type: Bait Type: rap Cover Size /eather Dat 80.6 (max.)] corolinus 0	Above Ground Aged Chicken 24" a sayi 0	Humidity Soil Moisture ⁴ Necrophilia americana 3	-996 (min.) 1.5315 Necrodes surinamensis 15	Date Checked ¹ : Permittee: TE Permit #: Survey Company: <u>-996</u> (max.) Other 6	Horizon Er Trap Night Valid (NegO(Yest)) 1	June 12, 202 ephanie Rain TE-00284A ivironmental	water A	
Projec Action Age	t Description: ency/Proponent: Daytime Temps Wind>10mph?6 ture Data Disturbed (rs1/N=0)	Hydroelectric I Grand River D: 77.29 (min.) No (Yes/No) americanus	Relicensing am Authority 93.27 (max.) orbicollis	Nicro tomentosus	Heavy Rain? ⁵	T 77.9 (min.) No ecies marginatus	Trap Type: Bait Type: rap Cover Size /eather Dat 80.6 (max.)	Above Ground Aged Chicken 24" a sayi	Humidity Soil Moisture ⁴ Necrophilia americana	-996 (min.) 1.5315 Necrodes surinamensis	Date Checked ¹ : Permittee: TE Permit #: Survey Company: 996 (max.) Other	Horizon Er	June 12, 202 ephanie Rain TE-002844 wironmental	water A	
Projec Action Age Cap Trap No. 5	t Description: ency/Proponent: Daytime Temps Wind>10mph?6 ture Data Disturbed (v=1/w=0) 0	Hydroelectric I Grand River D: 77.29 (min.) No (Yes/No) americanus 0	Relicensing am Authority 93.27 (max.)] orbicollis 3	Nicro tomentosus 0	Heavy Rain? ⁵	T 77.9 (min.) No ecies marginatus 0	Trap Type: Bait Type: rap Cover Size /eather Dat 80.6 (max.)] corolinus 0	Above Ground Aged Chicken 24" a sayi 0	Humidity Soil Moisture ⁴ Necrophilia americana 3	-996 (min.) 1.5315 Necrodes surinamensis 15	Date Checked ¹ : Permittee: TE Permit #: Survey Company: <u>-996</u> (max.) Other 6	Horizon Er Trap Night Valid (NegO(Yest)) 1	June 12, 202 ephanie Rain TE-00284A ivironmental	water A	
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				AMER	ICAN BUF	YING BEET	LE SURVE	<mark>(DATA CO</mark>	LLECTION F	FORM					
	ject Name:	Pensacola Reli			-			Above Ground			Survey Night:		4		
	t Description: ency/Proponent:	Hydroelectric I Grand River Da			1	т	rap Cover Size	Aged Chicken 24"			Date Checked ¹ : Permittee:	Ste	June 13, 202 phanie Rain	water	
											TE Permit #: Survey Company:	Horizon Er	TE-00284A vironmental	Services, Inc.	
						W	/eather Dat	a							
	Daytime Temps	78.48	91.49	Survey	Period Temps	80.42	85.46		Humidity		-996]			
	WE 140 10		(max.)			(min.)	(max.)		c	(min.)	(max.)				
	Wind>10mph?6	No (Yes/No)			Heavy Rain? ⁵	No	1		Soil Moisture ⁴	1.8307					
Cap	ture Data			Nicro	phorus spe	ecies			Necrophilia	Necrodes	Other	Trap Night	Time		
Trap No. 5	Disturbed (Y=1/N=0)	americanus 0	orbicollis 2	tomentosus 0	pustulatus 0	marginatus 0	carolinus 0	sayi 0	americana 5	surinamensis 22	7	Valid (No=0/Yes=1) 1	Checked ¹ : 9:07		
6	0	0	1	2	0	0	0	0	2	5	6	1	9:40		
Totals	0	0	3	2	0	0	0	0	7	27	13	2]		
No.	of disturbed traps	and/or bait (D):	0]	Addition	al survey night re	equired becaus	e of weather? ⁸	0 (No=0/Yes=1)]	# Valid Trap Nights:	2			
		List the inc	dividual ABB N	METRICS below a	ind complete	e the appropria	te columns. \	ou will then	COPY <u>each row</u>	and PASTE int	o Individual ABB	Capture Forn	n on Pg <u>6.</u>		
ABB	Caught in Trap						Female		Male	Female		Pronotum	Picture (Yes=1/No=0		Newly
Number	No.	Male	Female	Unknown Sex	Male New ⁹	Male Old ⁹	New ⁹	Female Old ⁹	Unknown Age ⁹	Unknown Age ⁹	Dead	Width (mm))	Recapture ¹⁰	Marked ¹¹
	mated Tot.	0	0	0	0	0	0	0	0	0	0	NA	0		
Comments:											-		-		
									LI COTIONI						
Proj	ject Name:	Pensacola Reli	censing	AMER	<mark>ICAN BUF</mark>	YING BEET		1	LLECTION F	FORM	Survey Night:		5		
Projec	t Description:	Pensacola Reli Hydroelectric I Grand River Di	Relicensing	AMER	ICAN BUF		Trap Type: Bait Type:	Above Ground Aged Chicken	LLECTION F	FORM	Survey Night: Date Checked ¹ : Permittee		June 14, 202		
Projec			Relicensing	AMER	ICAN BUF		Trap Type:	Above Ground Aged Chicken		FORM	Date Checked ¹ : Permittee: TE Permit #:		June 14, 202 ephanie Rain TE-002844	water	
Projec	t Description:	Hydroelectric I	Relicensing	AMER	ICAN BUF	Т	Trap Type: Bait Type: rap Cover Size	Above Ground Aged Chicken 24"	LLECTION F	FORM	Date Checked ¹ : Permittee:		June 14, 202 ephanie Rain TE-002844	water	
Projec	t Description:	Hydroelectric I Grand River Da 76.6	Relicensing am Authority 88.11		Period Temps	T W 78.44	Trap Type: Bait Type: Trap Cover Size	Above Ground Aged Chicken 24"	LLECTION F	-996	Date Checked ¹ : Permittee: TE Permit #: Survey Company: - 996		June 14, 202 ephanie Rain TE-002844	water	
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tal Number	r of Traps:	1			DATA	ENTRY IS ON		ED IN DATA	BLOCK 2						
				BLOCK	1 - INDIV	IDUAL TRAF	CAPTUR	E DATA TO	TALS BY SP	ECIES					
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5	0	0	12	0	9	0	0	sayi 0	25	97	27	5			
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o. of disturb	oed traps and/or ba	ait (D):	0]	Addition	al survey night re	quired becaus	e of weather? ⁸	0						
				BLOCK	(<mark>2 - Indivi</mark> c	lual ABB Capt	ture Data -	DATA ENTR	y <u>is</u> requir	ED IN THIS B	LOCK				
			COP	Y the INDIVIDUA	L ABB Captu	re Data from Ni		Forms and PA			W <u>BY</u> ABB Numb	er.	Picture		
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)	(Yes=1/No=0)	Recapture ¹⁰	Newly Marked ¹
otal ABB	0	0	0	0	0	0	0	0	0	0	0	NA	0	0	0
Comments:												1			
otal Number	r of Traps:	6				NY DATA IN		BLOCKIIII							
	BLOCK	3 - Total AB	<mark>B Capture</mark> D	ata by Trap / ⁻					es into the Su	irvey Summa	ry Form				
							Female		Male	Female		Total Trap/Bait		Newly	
Trap No.	Total ABB	Male	Female	Unknown Sex	Male New ⁹	Male Old ⁹	New ⁹	Female Old ⁹		Unknown Age ⁹	Dead	Disturbed	Recapture ¹⁰	Marked ¹¹	
5	0	0	0	0	0	0	0		Unknown Age ⁹				0	0	
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APPENDIX C USFWS Correspondence Re: Trap Placement

Stephanie Rainwater

From:	Stubbs, Kevin <kevin_stubbs@fws.gov></kevin_stubbs@fws.gov>
Sent:	Wednesday, March 23, 2022 1:55 PM
То:	Stephanie Rainwater
Subject:	Re: [EXTERNAL] GRDA Pensacola Relicensing Project - ABB Trap Placement

[EXTERNAL EMAIL]

That will work. Just put the traps in the best habitat that is available (more open grassland or mix with timber).

Kevin 918-695-6769

From: Stephanie Rainwater <srainwater@horizon-esi.com>
Sent: Monday, March 21, 2022 5:39 PM
To: Stubbs, Kevin <kevin_stubbs@fws.gov>
Subject: RE: [EXTERNAL] GRDA Pensacola Relicensing Project - ABB Trap Placement

Kevin,

Good evening! I have attached a pdf map as well as a kmz showing the Coal Creek mitigation area and the wildlife management areas. I have overlaid five proposed trap sites which cover the four wildlife management areas and the mitigation site. We placed the 6th trap in a far southeastern area that has a somewhat significant terrestrial area between the project boundary and the shoreline. Please let me know if you concur these traps sites provide sufficient coverage in the proper areas for this project.

Thanks!

Stephanie Rainwater Project Manager

Horizon Environmental Services, Inc. www.horizon-esi.com | An LJA Company

LJA Environmental Services, LLC www.ljaenv.com

321 S. Boston, Suite 300, Tulsa, OK 74103 O: 918.553.3232 | C: 918.219.9951

From: Stubbs, Kevin <kevin_stubbs@fws.gov>
Sent: Monday, March 14, 2022 3:07 PM
To: Stephanie Rainwater <srainwater@horizon-esi.com>
Subject: Re: [EXTERNAL] GRDA Pensacola Relicensing Project - ABB Trap Placement

[EXTERNAL EMAIL]

The new project boundary will include all wildlife management and wetland mitigation areas Like the Coal Creek site. So I would put traps at those sites and any other sites with the best available habitat.

Kevin

From: Stephanie Rainwater <srainwater@horizon-esi.com
Sent: Monday, March 14, 2022 1:25 PM
To: Stubbs, Kevin <kevin_stubbs@fws.gov
Subject: [EXTERNAL] GRDA Pensacola Relicensing Project - ABB Trap Placement

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Kevin,

Good afternoon! I'm currently trying to plan the 2022 ABB survey effort for the GRDA Pensacola Relicensing Project and would like to get your input. As a refresher, when I placed the six 2021 survey traps, I positioned them in areas that provided the most terrestrial coverage within the presumed project area which was defined at that time by the upstream extents model (see attached kmz titled "ABB_Trap_Project.kmz"). The boundary has since been reduced based on the results of the H&H study (see attached kmz titled "Project_Boundary_NEW_10012021.kmz"). As there a very few areas of significant terrestrial acreage between the shoreline and the project boundary for me to use the same site selection methodology, I was wondering if you would recommend the six locations that you would consider provide sufficient representation with respect to the project. You can just send me the lat/longs or drop pins in a kmz, whichever works best for you.

Thanks so much!

Stephanie Rainwater Project Manager

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