

THE TENNESSEE VALLEY AUTHORITY



Clinch River- Addendum Barge/Traffic Area

Terrestrial Animal Survey Report

Elizabeth B. Hamrick

Revision 0 – 05/01/2015

Revision 1 – 07/01/2015

This study has been prepared as a supporting document for the Clinch River Nuclear (CRN) Site Early Site Permit Application and is being distributed for project use. The study provides a summary of documented terrestrial habitats and common and protected terrestrial animals present on the 1200-acre Clinch River Property in Roane County, TN.

INTRODUCTION

Additional areas needed for a barge unloading zone and highway/traffic improvements were identified adjacent to the Clinch River Nuclear (CRN) Site, in Roane County, Tennessee in 2014. In order to support the feasibility investigation for these additional areas and meet guidelines provided by Nuclear Regulatory Commission (NRC), TVA Biological Permitting and Compliance (BCC) staff examined terrestrial animal resources on the barge/traffic area during all four seasons from fall 2014 to summer 2015.

In the fall of 2014, BCC staff performed a desktop analysis to identify rare species potentially occurring within the barge/traffic area. BCC staff also examined habitats on the property with an emphasis on identifying suitable habitat for listed species. Following these habitat surveys, BCC carried out terrestrial animal surveys in the barge/traffic area similar to those carried out on the larger proposed Clinch River Small Modular Reactor site. Diurnal surveys were conducted along four linear transects distributed across the landscape to represent the variety of habitat types within the barge/traffic area. Minnow traps, Sherman traps, and cover boards, were set up along these transects and monitored to assess amphibian, small mammal, and herpetofauna presence, respectively. Nocturnal surveys for calling frogs were conducted in close proximity to water features. Finally, acoustic monitoring equipment was used to detect/collect calls of bats present (spring, summer and fall only). No boat surveys were conducted along the Clinch River specifically for the barge/traffic area because previous boat surveys associated with the larger SMR site inadvertently included surveys of the barge/traffic area due to the location of boat ramps in the area.

FIELD OBSERVATIONS

HABITAT

The habitat of the Barge/Traffic Area is similar to that of the Clinch River Property in its heterogeneity and types. Habitat includes deciduous forest, coniferous forest, mixed deciduous ever-green forest, edge habitat, transmission line rights-of-way, herbaceous vegetation, a spring, wet-weather conveyances, river inlets, and wetlands. The majority of the barge/traffic area is comprised of deciduous forest over an undulating landscape (primarily north of Bear Creek Valley Road and along both sides of Water Tank Road). The area south of Bear Creek Valley Road along the Clinch River is comprised of herbaceous habitat along rights-of-way and river inlets, mixed deciduous/coniferous forest, forested wetland and edge habitat. The eastern edge of the barge/traffic area has a large pond/wetland surrounded by emergent vegetation, rights-of-way, mixed forest, edge habitat, and Bear Creek Valley Road. See Cox et al. 2015 for further detailed description of terrestrial habitat present on the Clinch River Property.

WILDLIFE SURVEYS

Visual and aural observations of terrestrial animals on the Barge/Traffic Area were very similar to terrestrial animal observations on the Clinch River Property. Most species observed are generalists and were found in multiple habitats across the Barge/Traffic Area, though some are habitat specialists where observations were confined to specific habitat types. Examples of bird species observed included American goldfinch, barred owl, blue jay, Carolina chickadee, Carolina wren, cedar waxwing, downy woodpecker, eastern phoebe, eastern towhee, field sparrow, golden-crowned kinglet, hermit thrush, northern cardinal, northern flicker, pine warbler, prairie warbler, red-bellied woodpecker, red-eyed vireo, red-tailed hawk, red-winged black bird, ruby-throated hummingbird, song sparrow, tufted titmouse, yellow-rumped warbler, and white-eyed vireo. Belted kingfisher, great blue heron, and tree swallow were observed along the riparian corridor. A juvenile bald eagle and several foraging osprey were observed flying over the site. Common amphibians and reptiles observed were American Toad, southern leopard frog, pickerel frog, spring peeper, northern watersnake, red-eared slider, and box turtle. Upland chorus frog tadpoles also were identified from a wet depression a mowed area in the northwestern corner of the Barge/Traffic area.

Common mammals observed in the Barge/Traffic Area included American beaver, white-tailed deer, coyote, eastern gray squirrel, eastern chipmunk, eastern cottontail, raccoon, and Virginia opossum. Surveys specifically designed for detecting bats also were conducted in 2014 and 2015. See section in this addendum entitled BAT ACOUSTIC SURVEY RESULTS for further discussion on surveys for bats.

WILDLIFE SURVEY METHODOLOGY AND RESULTS (BARGE/TRAFFIC AREA)

Terrestrial animal surveys on the barge/traffic area were conducted in 2014 and 2015 for approximately 1 week in each of the 4 seasons (November 3-7, 2014; January 5-9, 2015; April 6-10, 2015, and June 22-26, 2015). This sampling regime aligns NRC recommendations and surveys performed on the Clinch River Property. A total of 117 terrestrial animal species were observed at the barge/traffic area, 13 of which were not observed at the Clinch River Property. These species were either visually observed, heard, trapped, noted based on sign (e.g., scat remains), and/or acoustically detected across one or more seasons using multiple detection methods (Table 1, Figure 1). In total 190 terrestrial animal species were observed across both sites animals over the course of all terrestrial animal studies from 2011-2015. This included documentation of 9 species of anuran (frog or toad), 11 species of bat, 106 species of bird, 33 species of invertebrate, 16 mammal species (other than bats), 1 salamander species, 4 species of snake, and 9 species of turtle. These detections resulted in a master species list for the Clinch River Property and Barge/Traffic Area (Table 2 of the Clinch River Property Terrestrial Animal Survey).

Four linear transects were established across the Barge/Traffic Area for surveys of this area during the fall of 2014-summer of 2015 (Figure 1). Two transects were sited within upland mature deciduous forest (one in the northeast corner and one near a spring parallel to Water Tank Road) one in edge habitat between wetland forest (along the Clinch River) and an upland pine forest fragment, and one through a stand of pine trees adjacent to a transmission line right-of-way and large wetland. Surveys along these transects followed methodology used for

Terrestrial Animal Survey Report

TVA Clinch River Site

surveys at Clinch River Property with modifications to fit this smaller Barge/Traffic area. Survey techniques included Sherman traps, cover boards, and visual and aural encounters. These survey types are further described below.

Sherman traps (N=5) and cover boards (N=4) were deployed along these transects to survey small mammals and herpetofauna, respectively. Sherman traps and cover boards were placed alternately along each transect 15m apart from each other, with Sherman traps being the first and last trap type deployed along each transect. The first trap was placed 15 m from the beginning of each transect, with each trap approximately 15 m from adjacent traps. Cover boards were made of plywood cut in 2 foot by 2 foot squares. A total of 20 Sherman traps and 16 cover boards were deployed across the Barge/Traffic Area. Four minnow traps were deployed across the Barge/Traffic Area to inventory frog and salamanders. Two minnow traps were placed along an inlet of the Clinch River in a transmission line right-of-way and in an emergent wetland alongside Bear Creek Road. Anuran call surveys were conducted adjacent to two aquatic sites on the Barge/Traffic Area and in accordance with the North American Amphibian Monitoring program (North American Amphibian Monitoring Program 2012). Techniques for baiting and checking traps, visual and aural encounter surveys, anuran surveys, and opportunistic detections were identical to those described for the Small Modular Reactor Clinch Property Site terrestrial animal surveys. Any observations were recorded and included in the overall catalog of species observed at both the Clinch River Property and Barge/Traffic Area reflected in Table 2 of the Terrestrial Animal Survey Report of the Clinch River Property.

Table 1. Type and timing of wildlife surveys conducted in 2014-15 on the Barge/Traffic Area, Roane County, TN

Survey Type	Survey Location	Survey Description, Sample Size	Survey Dates ¹				Targeted Animal Groups
			F	W	Sp	Su	
Visual and Aural Encounter Surveys (VES) by Foot	Linear transects (N = 4) 120 m distributed across Barge/Traffic Area	N = 4 surveys/season/transect, walked beginning to end on 4 consecutive days per season, noting aural and visual detections	X	X	X	X	Any species observed, but focused on birds and mammals
Sherman Traps	Placed along same transects used for VES, alternating with cover boards	N = 5 traps/transect/season spaced 15m from transect endpoints and adjacent cover board, opened and then checked for 3 consecutive days,	X	X	X	X	Small mammals
Cover boards	Placed along same transects used for	N = 4 boards/transect/season spaced 15 m apart from adjacent Sherman trap,	X	X	X	X	Amphibians and reptiles

Terrestrial Animal Survey Report

TVA Clinch River Site

	visual encounter surveys, alternating with Sherman Traps	checked for 3 consecutive days					
Minnow Traps	Aquatic water bodies (river inlet and wetland, (N = 2) distributed across Barge/Traffic Area	N = 4 traps (2 traps per site)/season, partially submerged; traps set and then checked for 3 consecutive days,	X	X	X	X	Anurans (frogs, toads, salamanders)
Anuran Call Surveys	Aquatic water bodies across Barge/Traffic Area (N=2)	N=1 survey/site/season, post- sunset following a rain event	X	X	X	X	Frogs and toads
Bat Acoustic Surveys	Water bodies and forested corridors	4 acoustic detectors, deployed on day 1 of survey and set collect data for 4 consecutive nights		X	X	X	Bats
Opportunistic Sitings	Wherever present on Barge/Traffic Area	Aural, visual, and sign (e.g., scat) indicating animal presence	X	X	X	X	Any wildlife observed were noted

¹ F = Fall (November), W = Winter (January); Sp = Spring (April); Su = Summer (June).

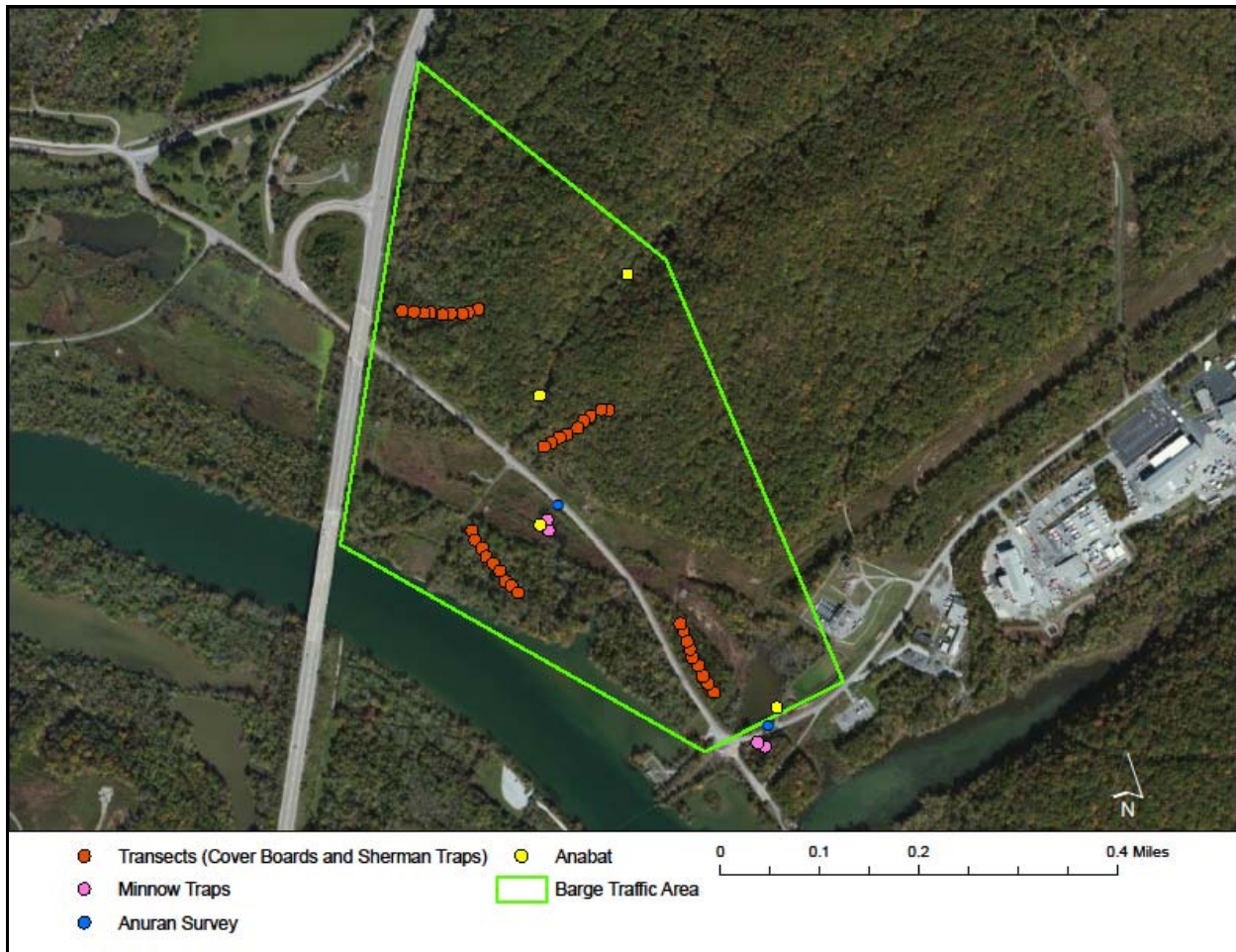


Figure 1. Survey locations in 2014-15 for terrestrial animals, Clinch River Property, Roane County, TN.

BAT ACOUSTIC SURVEY RESULTS (2014-2015)

Anabats used at the Traffic/Barge Area were directed down Water Tank Road (Sites 1 and 2; a rarely used forested corridor), across an inlet of the Clinch River (Site 3) and across a large wetland (Site 4). Acoustic monitor placement and acoustic analysis for these surveys followed the most current Indiana bat survey guidelines (USFWS 2015). Forest dwelling bats and those that forage and travel in and along forests were likely to be recorded along Water Tank Road, while the wetland and inlet are likely used by multiple bats for drinking, and foraging. It also is likely that individual bats were detected and recorded multiple times due to repeated visits to these aquatic features. Individual bats likely visited these sites multiple times, perhaps making multiple passes in front of the Anabat during a single visit, thus resulting in multiple recordings.

Terrestrial Animal Survey Report

TVA Clinch River Site

Acoustic monitors at the Barge/Traffic area detected 10 species across the Clinch River Property (Figure 1, Table 2). The most prevalent species detected were tricolored bat (*Perimyotis subflavus*), red bat (*Lasiurus borealis*), evening bat (*Nycticeius humeralis*), gray bat (*Myotis grisescens*), big brown bat (*Eptesicus fuscus*), and silver-haired bat (*Lasionycteris noctivagans*). Other species recorded were hoary bat (*Lasiurus cinereus*), little brown bat (*Myotis lucifugus*), and northern long-eared bat (*Myotis septentrionalis*). Recordings of bats that were identified by acoustic software as Indiana bat (*Myotis sodalis*) suggest this species may have been present in the Barge/Traffic Area, though visual assessment of these calls determined that the species identification for these recordings are not definitive.

Table 2 Summary of seasonal results of federally listed bat species by acoustical (Anabat) monitoring at the Barge Traffic Area, Roane County, Tennessee, 2014-2015.

Anabat Location ¹	Location ¹	Survey Season ²	Bat Calls (BCID/K-PRO) ³	# Identified as MYSO (BCID/K-PRO) ⁴	# Identified as MYGR (BCID/K-PRO) ⁵	# Identified as MYSE (BCID/K-PRO) ⁶
1	Water Tank Rd, forested corridor (North)	Fall	26/37	0/0	3/4	0/0
		Spring	430/676	0/0	12/11	0/5
		Summer	377/499	1/0	30/23	8/5
2	Water Tank Rd, forested corridor (South)	Fall	70/102	0/0	7/2	0/3
		Spring	716/1038	0/0	11/8	0/2
		Summer	304/408	3/0	17/11	7/3
3	Inlet of the Clinch River surrounded by emergent vegetation and scatterend trees	Fall	3/6	0/0	0/0	0/0
		Spring	85/149	0/0	0/0	0/0
		Summer	87/127	0/0	9/7	0/0
4	wetland surrounded by emergent vegetation, forest and Bear Creek Road	Fall	12/16	0/0	0/1	0/1
		Spring	1270/1804	0/0	6/0	0/0
		Summer	149/187	0/0	7/15	0/3
Total			3529/5049	4/0	102/82	15/22

¹See Figure 1 for 2014-2015 acoustic monitoring locations.

²Fall Surveys occurred 11/03/14-11/07/14; Spring Surveys occurred 04/06/15-04/10/15; Summer Surveys occurred 06/22/15-06/26/15.

³The number of files that passed the 'NOISE' filter indicating these were bat calls using Bat Call Identification (BCID) and Kaleidoscope Pro software.

⁴MYSO = *Myotis sodalis* (Indiana bat).

⁵MYGR = *Myotis grisescens* (gray bat).

⁶MYSE = *Myotis septentrionalis* (northern long-eared bat).

REFERENCES

Cox, P. B., A. J. Dattilo, J. T. Baxter. 2015. Clinch River Small Modular Reactor Site: Terrestrial Plant Communities and Botanical Survey Report. Tennessee Valley Authority. 13 pp.

North American Amphibian Monitoring Program. 2012. Patuxent Wildlife Research Center, United States Geological Society. Accessed February 27, 2015. Available at <https://www.pwrc.usgs.gov/naamp/index.cfm?fuseaction=app.protocol> .

U. S. Fish and Wildlife Service (USFWS). 2015. Range-wide Indiana Bat Summer Survey Guidelines April 2015. Available online: <http://www.fws.gov/midwest/endangered/mammals/inba/surveys/pdf/2015IndianaBatSummerSurveyGuidelines01April2015.pdf> (Accessed 1 July 2015).

