

FINAL

**Inventory of the Herpetofauna of
Chickamauga and Chattanooga National
Military Park**



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**National Park Service
Cumberland Piedmont Inventory and Monitoring Network
PO Box 112
Mammoth Cave, KY 42259**

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INTRODUCTION

During the fall of 1863, Union and Confederate armies fought for control of the city of Chattanooga which was a key rail center and gateway to the heart of the Confederacy. In September, a two-day battle was fought near Chickamauga Creek which resulted in the retreat of Union forces. This was considered the last major Confederate victory in the Western theater, but General Grant and his Union forces ultimately regained control of Chattanooga two months later. Chickamauga and Chattanooga National Military Park was established in 1890 and is the first and largest of the national military parks. It is managed under the guidance of the 1916 Organic Act. The National Park Service (NPS) is responsible for the preservation of native wildlife, including amphibian and reptile species, within Chickamauga and Chattanooga National Military Park in accordance with the 1916 NPS Organic Act, as amended and this direction is re-enforced through both NPS policy and guidelines affecting natural resource management. The Cumberland/Piedmont Inventory and Monitoring Network was established by the NPS Natural Resource Challenge Initiative. Among the goals set forth by this initiative are documentation of the occurrence of at least 90% of the species of vertebrates and vascular plants that occur within each National Park unit containing “significant natural resources” and documenting relative frequencies of occurrence by habitat type and descriptions of the distribution and relative abundance of species of special concern. Following a preliminary review of the existing inventory data within each network park, the Inventory and Monitoring Network for the Cumberland/Piedmont determined that the largest and most pressing data gaps involved amphibian and reptile species. This lack of information was targeted as one of the network’s highest priorities for funding. It is therefore necessary to conduct a baseline inventory of the herpetofauna resources within these NPS Parks, because the existing information is either non-existent or poorly defined.

This inventory effort will provide Park Managers with comprehensive, scientifically based information about the distribution and status of herpetofauna resources occurring within the parks. This information will be used for management decisions regarding park resources and protection, as well as education and outreach to the public. Further, this is an important part of the groundwork necessary for managers to develop effective monitoring programs designed to ensure the continued long-term health of Park natural resources.

Recent data shows that reptiles and amphibians are important, perhaps critical, components of terrestrial and aquatic ecosystems. Both groups are considered to be excellent indicator species of environmental degradation, amphibians because of their complex life cycle and permeable skin and reptiles because of their frequent position as the top carnivores in the food chain (Gibbons 1988). These facts have led to an increasing recognition of the need for collecting better data on the biodiversity and ecology of amphibians and reptiles by NPS managers (Scott and Seigel 1992).

Currently, NPS managers at Chickamauga and Chattanooga National Military Park possess neither a comprehensive baseline inventory nor the information upon which to base monitoring of the Park's amphibian and reptile species utilizing park lands and waters. In recent years, the shift to protecting biodiversity through the preservation of functional ecosystems has made reliable inventory and monitoring programs of critical importance to NPS management. Without detailed information on the distribution, habitat requirements and relative abundance of native amphibian and reptile species, resource managers may only preserve that portion of the fauna which is highly visible or economically important (Bogan, *et al*, 1988). For these reasons, Accipiter Biological Consultants was contracted by the NPS to design and develop a park-wide inventory of reptile and amphibian species currently occurring at the Park as part of the overall Inventory and Monitoring Program being conducted for the Cumberland/Piedmont Inventory and Monitoring Network.

GOALS AND OBJECTIVES

This inventory program for surveying reptile and amphibian species at Chickamauga and Chattanooga National Military Park has the following goals:

1. To determine species presence information, both habitat specific and across landscapes and to document at least 90% of the species thought to occupy the Park lands.
2. To document relative frequencies of occurrence by habitat type within the Park.
3. To describe the distribution and relative abundance of species of special concern within the Park.
4. To collect voucher specimens or photographs of species occurring in the Park which are not already documented. Emphasis is put on photographic vouchers in this park.

DESCRIPTION OF THE STUDY AREA

The Park consists of over 3,318 ha straddling the Georgia/Tennessee border. Only the three largest units of CHCH (i.e., Chickamauga Battlefield, Lookout Mountain, and the Sherman Reservation) will be covered by this inventory.

Chickamauga Battlefield, the largest unit of the Park, contains limestone cedar glades, creek bluffs, sagponds, beaver and quarry ponds, and open fields which are either cut twice a year for hay or mowed regularly. The oak-hickory forests surrounding the glades are comprised of post and northern red oak, loblolly pine, and pignut hickory. Lookout Mountain, a 1,120 ha section of the Park is comprised of a maintained lawn, sandstone cliffs, and rich limestone slopes. The slopes are dominated by white ash, northern red oak, and hickory species. Cave Spring is located near the northwest boundary of this unit and the woods along Lookout Creek contain floodplain species such as hackberry. The Sherman Reservation, a 20 ha tract, is predominantly a disturbed second-growth woodland.

Habitats and Descriptions

Eleven major community types were utilized in this inventory process. These were provided by NPS personnel and include the following:

Mixed Hardwood Forest (MH) – This category consists of hardwood forest dominated by Oaks, Ash, Beech and Maples. While it may occur under mesic conditions oak species do not usually dominate. It is usually found higher on the slopes than the following.

Mixed Mesic Hardwood Forest (MF) – This habitat includes such tree species as Red and White Oaks, with smaller amounts of Beech, Basswood and Buckeye. It usually includes lower areas in the proximity of streams or springs.

Juniper/Hardwood Forest (JH) – This habitat is characterized by mixed Juniper and a variety of hardwood species, usually with some degree of shrub or forb understory. This habitat is found in patches throughout the Park.

Pine/Hardwood Forest (PH) – This habitat consists of mixed Pine and hardwood species. It is usually found on slopes or ridges and usually has little understory. This habitat is usually drier than the previous habitat and is uncommon on the Park.

Open Fields (OF) – This habitat consists of open, grassy areas and exists in several forms on the Park. Mowed fields and agricultural fields are also included in this habitat form.

Cedar Glades (CG) – Generally open areas of predominantly limestone substrate dominated by forbs and grasses within the glade and many times being encroached on by Eastern Red Cedar and various oak species.

Rock Faces (RF) – Rock faces with no apparent source of constantly running water. These areas tend to have vegetation adapted to drier habitats.

Ponds (PO) – This habitat is comprised of water bodies which are encircled with hydric vegetation. It includes manmade lakes, as well as natural (beaver dams) water bodies. Emergent vegetation may or may not exist depending on conditions.

Springs (SP) – Springs occur where ground water discharges to the surface. Small stream flows often result, however, for purposes of this inventory, only stream flows where the ground water discharge point is readily apparent are considered springs.

Streams (ST) – These habitats feature flowing water of an ephemeral, intermittent or perennial nature. Substrate on the bottom ranges from mud or sand to various sized cobbles or even bedrock. Streams are also often associated with adjacent habitats such as forests.

Ephemeral Pools (EP) – This habitat consists of pools that exist only in response to precipitation and/or its subsequent runoff. They receive no water from springs and no long-continued supply from melting snow or other surface source. This habitat is usually associated with other habitat types such as surrounding forest or riparian corridors.

METHODOLOGIES

A detailed review of the field methods utilized in this inventory program is provided in the following paragraphs. This selection of methodologies was determined by the need to balance the availability of suitable personnel against the need to establish a valid, quantifiable inventory program.

This project began with a literature search to establish a potential list of reptile and amphibian species that include Chickamauga and Chattanooga National Military Park in their range of distribution. This search provided a potential list of 50 species or discernable subspecies. Further search was conducted to determine if potential habitat exists on Chickamauga and Chattanooga National Military Park for each species on that list and to gain insight on the life history of each species. A number of species reach the limit of their natural range at or near the Park. Confirming their presence was a priority during this inventory process.

We utilized seven primary inventory methods to attain goals 1 and 2. These are random plots with associated sampling frameworks to provide standardized results for defined habitat areas and general herpetological collecting and observation, minnow traps, coverboards, audio frog breeding surveys, road surveys and drift fences utilizing funnel type live traps or cover boards to inventory special habitat areas.

Random Plots with Associated Sampling Frameworks

Circular, 1-hectare random plots were established by the NPS as part of the networks' vegetation mapping/plant inventory project. Most of the plots fall within common habitats that comprise much of the area within the park – primarily terrestrial or rarely flooded environments. These include both open and wooded habitats. Operationally, the grid plots are sampled in a structured manner that involves cover boards and constrained-area searches within the 8 m² rectangular plots, as well as generalized searches of the remainder of the circular 1-hectare plot. The structured placement of the cover boards and 8m² rectangular plots for constrained-area searches is for the purpose of producing standardized results for defined habitat areas that can be compared to estimate relative species richness among parks and habitat types. Within plots, one of two survey techniques were applied uniformly across all spatial and temporal replicates, unless otherwise provided for. (a) Where the plots fell either in open environments or in floodplains (whether open or forested) cover boards were used, as shown in Statement of Work. (b) Where the plots fell in upland forest and woodland, 8m² plots without cover boards were used in a system of “area-constrained searches”.

- a. Cover board methodology: Applicable in open environments such as prairies, old fields and hay fields, as well as flood plains and riparian corridors, and in forest/field edges.
 - i. Within each 1-ha plot, four cover boards were laid out in a systematic cluster, as shown in the Statement of Work.
 - ii. Two boards were placed flush with a line running north through each plot center. The northwest corner of one of these boards was placed flush with the east side of the line at 10 meters north of the center point. The southeast

corner of the other board was placed flush with the west side of the line at 10 meters south of the center point.

- iii. Two boards were placed flush with a second line that runs perpendicular to the north running line (90°- 270°). The northeast corner of one of these boards was placed flush with the south side of the line at 10 meters east of the plot center. The southwest corner of the other board was placed flush with the north side of the line at 10 meters west of the center point.
- iv. At each plot, 2 of the boards were wooden and the other 2 were tin (of approximately equivalent dimensions). Preferred material for the wooden boards was 4' X 4' plywood.

b. Area constrained search (ACS) methodology: To be applied in wooded environments such as upland and successional forest (where cover boards are not used).

- i. At each 1 ha plot, four ACS plots were laid out in a systematic cluster as illustrated in the Statement of Work.
- ii. Each ACS plot was 8m².
- iii. Two ACS plots were placed flush with a line running north through each grid point. The northwest corner of one of these plots was placed flush with the east side of the line at 20 meters north of the plot center. The southeast corner of the other plot was placed flush with the west side of the line at 20 meters south of the center point.
- iv. Two ACS plots were placed flush with a second line that runs perpendicular to the north running line (90°- 270°). The northeast corner of one of these plots was placed flush with the south side of the line at 20 meters east of the plot center. The southwest corner of the other plot was placed flush with the north side of the line at 20 meters west of the center point.

Frequency of cover board and ACS sampling on sample plots: Within each 1 ha plot, each set of cover boards and/or set of ACS plots were sampled at least once during each season in which herpetofauna are active.

During the course of this inventory 40 of these plots were utilized and have been surveyed six times. Results of these surveys may be found in Appendix A. Table 1 lists the utilized plots and their location and affiliated habitat.

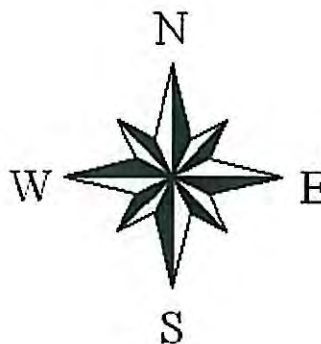
Table 1: Random Plots Established by Nature Serve

Plot #	UTM Coordinates NAD 83	Habitat
CHCH-1	16 S 657265 3866765	MF
CHCH-2	16 S 658402 3863340	JH
CHCH-3	16 S 658395 3864484	PO
CHCH-4	16 S 658402 3865608	OF
CHCH-5	16 S 658396 3866774	OF
CHCH-6	16 S 659561 3863311	MH

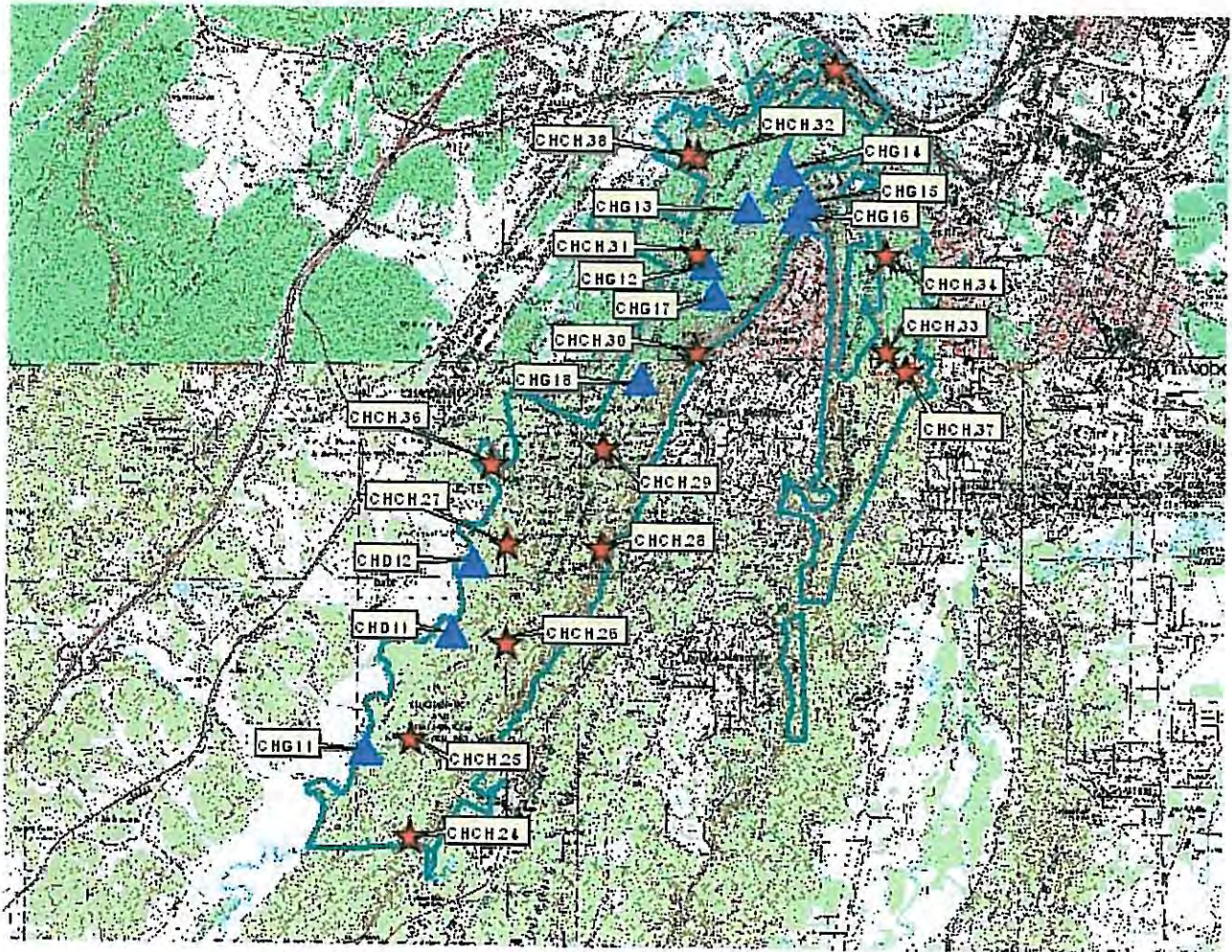
Plot #	UTM Coordinates NAD 83	Habitat
CHCH-7	16 S 659536 3864469	JH
CHCH-8	16 S 659545 3865626	MH
CHCH-9	16 S 659557 3866774	MH
CHCH-10	16 S 659532 3867909	MF
CHCH-11	16 S 660687 3862188	OF
CHCH-12	16 S 660694 3863344	JH
CHCH-13	16 S 660676 3864593	PH
CHCH-14	16 S 660689 3865623	MH
CHCH-15	16 S 660690 3866763	MH
CHCH-16	16 S 660680 3867916	JH
CHCH-17	16 S 660810 3863042	JH
CHCH-18	16 S 657877 3867721	MF
CHCH-19	16 S 659847 3866269	OF
CHCH-20	16 S 659697 3865703	CG, PH
CHCH-21	16 S 660469 3864406	CG
CHCH-22	16 S 657156 3866056	PH
CHCH-23	16 S 660720 3862128	MF
CHCH-24	16 S 647509 3870128	MH
CHCH-25	16 S 647517 3870976	MH
CHCH-26	16 S 648368 3871822	MF
CHCH-27	16 S 648368 3872685	MH
CHCH-28	16 S 649213 3872657	PH
CHCH-29	16 S 649224 3873523	PH
CHCH-30	16 S 650063 3874370	MH
CHCH-31	16 S 650063 3875219	MH
CHCH-32	16 S 650061 3876079	MH
CHCH-33	16 S 651780 3874380	MH
CHCH-34	16 S 651762 3875224	MH
CHCH-35	16 S 651292 3876849	MH
CHCH-36	16 S 648217 3873372	MF
CHCH-37	16 S 651958 3874212	PH
CHCH-38	16 S 649967 3876081	MF
CHCH-39	16 S 660508 3882066	MH
CHCH-40	16 S 660601 3882168	MF

General Herpetological Collecting and Observation

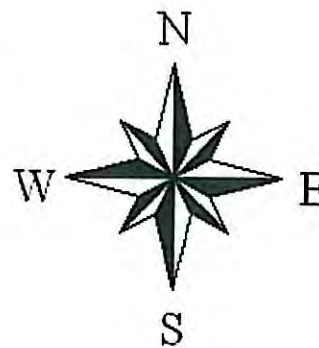
Also known as hand collecting, this method is purported to provide the largest number of individuals and species based on comparable inventory projects. Specific methods included carefully turning and replacing ground cover, time constrained hand collecting, seining and dip netting of small ponds or streams within the area, and spotlight surveys of aquatic habitats.



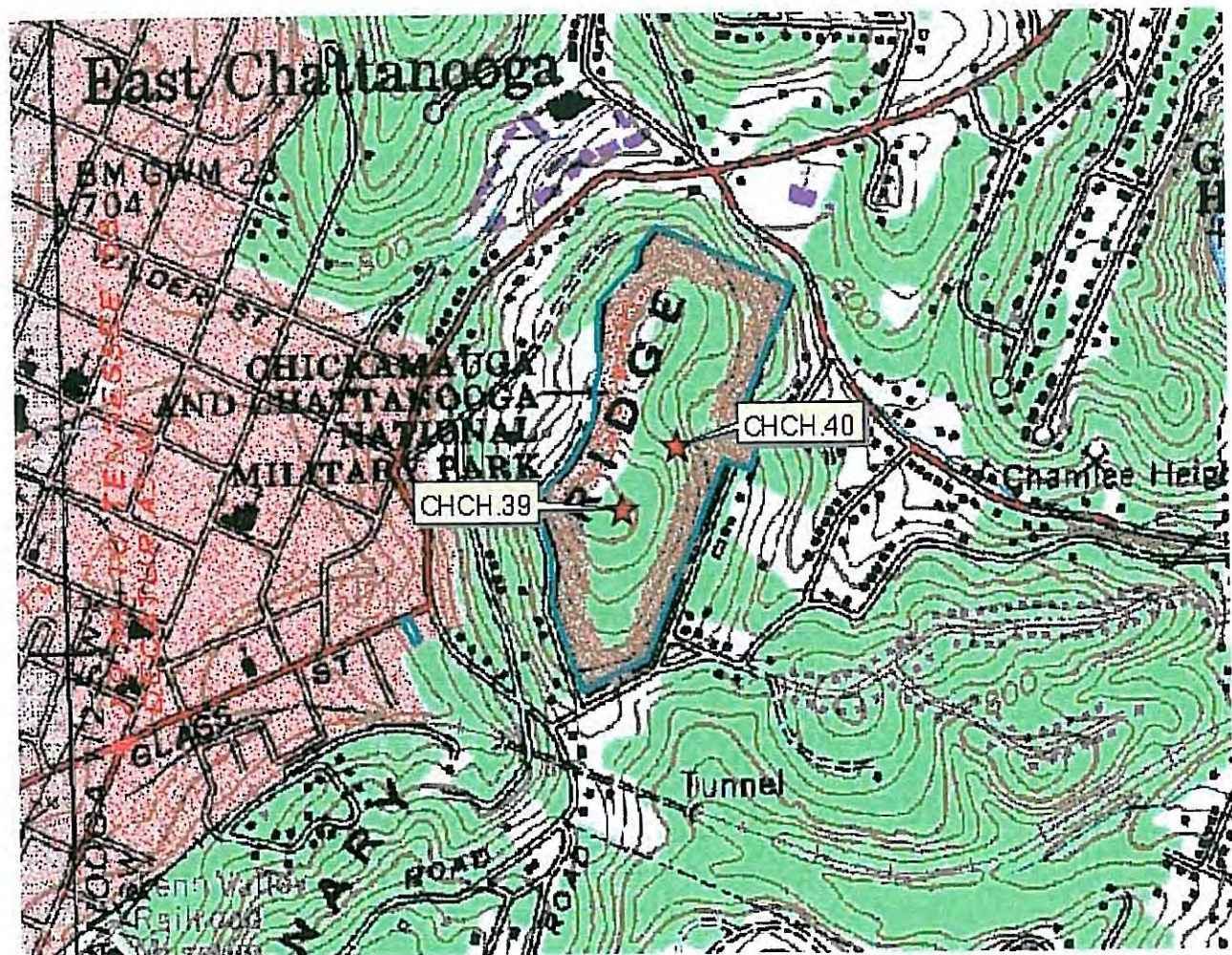
Chickamauga and Chattanooga NMP Lookout Mountain Sampling Plot Locations



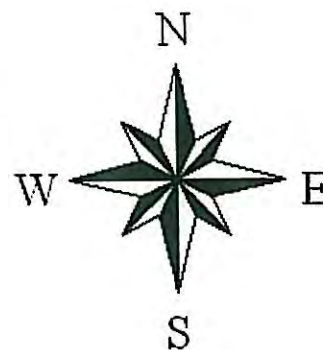
- ★ NatureServe plots
- ▲ Plots established by Accipiter Biological



Chickamauga and Chattanooga NMP Sherman Reservation Sampling Plot Locations



- ★ NatureServe plots
- ▲ Plots established by Accipiter Biological



Some hand collecting was accomplished by raking small areas of forest floor debris on appropriate plots. All disturbed habitats were restored to their original condition to the greatest degree possible. This methodology also includes visual observations of reptiles and amphibians made during the survey of the area, including surveys of basking turtles, frogs and snakes at a distance utilizing binoculars. Sites have been chosen so as to sample each major habitat within the Park unit. During the course of this inventory 25 sites have been established to sample the major as well as specialized habitats within the Park. Each has been sampled six times. Data on reptiles and amphibians located during this sampling is located in Appendix A. Table 2 lists the utilized plots and their location and affiliated habitat.

Table 2: General Collecting Sites

Plot #	UTM Coordinates NAD 83	Habitat
G-1	16 S 660442 3867434	CG, PH
G-2	16 S 659551 3866712	ST
G-3	16 S 660218 3863891	ST
G-4	16 S 660611 3864167	CG, JH
G-5	16 S 661744 3864137	ST
G-6	16 S 658951 3867645	ST
G-7	16 S 658829 3863459	ST, PH
G-8	16 S 659359 3863628	EP
G-9	16 S 657803 3863571	OF
G-10	16 S 657584 3865554	JH
G-11	16 S 647099 3870855	SP
G-12	16 S 650138 3875117	MH
G-13	16 S 650515 3875602	MH
G-14	16 S 650876 3875935	MH, PH, MF
G-15	16 S 651051 3875663	MH, MF
G-16	16 S 650962 3875523	MH
G-17	16 S 650219 3874849	SP, MH
G-18	16 S 649553 3874100	MH
G-21	16 S 657992 3864475	RF, PH
G-22	16 S 658454 3866137	OF, EP
G-23	16 S 658103 3866548	OF
G-24	16 S 658861 3865783	OF
G-25	16 S 660619 3864154	PH
G-26	16 S 658686 3865326	PH
G-27	16 S 658864 3865297	OF

Minnow Traps

Minnow traps are an effective means of capturing aquatic amphibians and reptiles, especially tadpoles, frogs, salamanders, salamander larvae and aquatic snakes. They can be set in most

aquatic situations, but appear to be most effective in ponds or swamps with shallow waters. Traps are set near the shoreline, in water deep enough to at least cover the funnel openings. The traps are set from 5-10 meters apart and are checked daily. During the course of this inventory 5 sites have been identified for utilization of this methodology. Some of these suffered from lack of water depth during the late summer visits. All others were sampled during those timeframes. Data on reptiles and amphibians located during these samplings is located in Appendix A. Table 3 lists the utilized plots and their location and affiliated habitat.

Table 3: Minnow Trapping Sites

Plot #	UTM Coordinates NAD 83	Habitat
M-1	16 S 657889 3863638	ST
M-2	16 S 657911 3863623	SP
M-3	16 S 659305 3867971	ST
M-4	16 S 657899 3867762	ST
M-5	16 S 658799 3864327	PO

Coverboards (Artificial Shelters)

One of the major disadvantages of minnow and other “active” traps is that they must be set and monitored on a continual basis. An alternative method of inventorying herpetological communities involves the use of artificial shelters established in systematic arrays in various habitats. This method has been utilized extensively to sample reptile and amphibian populations nationwide in a variety of habitats. The major advantages of this approach are that they require no maintenance and they can be checked whenever time permits. These shelters are very effective in sampling salamanders, lizards, snakes and frogs. The sampling scheme utilized consists of the following; Arrays of coverboards consisting of .66 meter by .66 meter sections of exterior plywood were established and set up. Each array consisted of at least four boards and was arranged randomly through each terrestrial habitat block located on Park. All were sampled every field day during the study that investigators are in the area of the array. Realistically, arrays should be sampled at least a month after they are set up to allow the boards to age and to adequately compact the vegetation under them for easier visibility of reptiles and amphibians utilizing the shelters. These coverboards were also utilized in conjunction with drift fences because pitfall traps cannot be used due to the ground disturbing nature in an historical park. (See Drift Fences section below.)

Frog Breeding Surveys

The fact that anuran amphibians congregate for breeding allows for highly effective inventories of these species. These surveys involve the systematic survey of major aquatic habitats during the primary breeding seasons for these species in early spring and early summer.

Sites established under this approach were surveyed by spot lighting at night and by active listening in the various aquatic habitats by the biologists involved in this study. During the

course of this inventory, the entire Park was driven twelve times at speeds appropriate for the road riding methodology detailed below, six times during the day and six times at night (after dark). At least 13 sites were established to have calling anurans during those surveys. Those sites were specifically monitored throughout the remainder of this inventory process. Data on frogs and toads located during this sampling is located in Appendix A. Table 4 lists the utilized plots and their location and affiliated habitat.

Table 4: Frog Breeding Survey Sites

Plot #	UTM Coordinates NAD 83	Habitat
M-2	16 S 657911 3863623	PH
M-4	16 S 657899 3867762	ST, MH
M-5	16 S 658799 3864327	ST
G-2	16 S 659551 3866712	ST
G-6	16 S 658951 3867645	OF, PO
G-7	16 S 658829 3863459	PO
G-8	16 S 659359 3863628	OF, EP
G-14	16 S 650876 3875935	PH
G-21	16 S 657992 3864475	PH
G-24	16 S 658861 3865783	OF
G-26	16 S 658686 3865326	PH
R-14	16 S 660689 3865623	PH
R-20	16 S 659697 3865703	PO

Road Surveys

Many amphibians and reptiles routinely cross roads during their daily activities and investigators have found this approach to be the most effective method of sampling many terrestrial snakes, lizards, turtles, frogs and toads, as well as many semi-aquatic snakes. This approach has been used to successfully census and monitor amphibians and reptiles throughout the country and provides a transferable approach for use at Chickamauga and Chattanooga National Military Park. The sampling scheme for this approach consists of driving at slower speeds (10-25 miles per hour) and observing the amphibians and reptiles crossing or otherwise utilizing the roadway. The entire Park was sampled utilizing this methodology two times each visit to the Park, once during the day and once at night (after dark). The Park has been sampled in its entirety twelve times. Overall the results have been disappointing, with few reptiles and amphibians tallied utilizing this methodology. Of interest is the fact that no herps of any kind were found on roads in the park during 2005 surveys. Data on reptiles and amphibians located during this sampling is located in Appendix A.

Drift Fences

Drift fences are frequently a most productive method of inventorying herpetological communities. Equipped with pitfall traps, funnel traps or both, studies show that the productivity

of drift fences is significantly higher than hand-captures, although, this does not always apply in all areas of the country. These arrays were set up to sample each terrestrial habitat identified on the Park lands. These arrays have been developed using 10 inch aluminum flashing for drift fence material with plastic 5-gallon pails embedded in the ground so that the top was flush with the ground surface being used for pitfalls. Aluminum screen funnel traps and plastic funnel traps used by commercial snake breeders were used to augment the trapping effort at the drift fence sites. This methodology was further augmented by the use of .66 meter by .66 meter coverboards placed alongside the drift fences since pitfall traps could not be utilized due to the ground disturbing nature in an historical park. 3 sites were established utilizing these sample methods on the Park with the first active trapping beginning during the spring 2004 surveys with data on reptiles and amphibians located during the sampling located in Appendix A. Table 5 lists the utilized plots and their location and affiliated habitat.

Table 5: Drift Fence Sites

Plot #	UTM Coordinates NAD 83	Habitat
D-1	16 S 660601 3863042	JH
D-11	16 S 647864 3871880	MH
D-12	16 S 648056 3872505	MH

ANALYSIS OF SURVEY METHODOLOGY EFFICIENCY

Table 6 summarizes the overall efficiency of the seven field methodologies utilized in this survey as well as the efficiency of all seven combined. An efficiency quotient has been established to enumerate this efficiency and is determined by dividing the number of species inventoried by a certain methodology by 50, the total number of species known to occur in the general area of Chickamauga and Chattanooga National Military Park. This would give a numerical value of the likelihood of a given methodology to accomplish a total inventory given the conditions available on Chickamauga and Chattanooga National Military Park during the survey.

Table 6: Field Methodology Efficiency Analysis

Methodology	No. of Species (n)	No. of Individuals	Efficiency Quotient (n/50)
General Herpetological Collecting	33	1725	.667
Minnow Traps	5	70	.100
Random Plots	8	32	.160
Frog Breeding Surveys	9	77+	.180
Road Surveys	4	8	.080
Drift Fences	2	9	.040
Combined Six Methodologies	36	1921	.720

Table 6 shows very low efficiency quotients for several of the methodologies used in this inventory. This is to be expected as minnow traps and frog breeding surveys target smaller numbers of species than other methodologies. Each methodology has its own strengths and weaknesses as an inventory device. These and other potential biases will be discussed in the following paragraphs. Weather is a factor affecting the efficiency of all individual field methods, as well as the combination of the six.

PROCESSING OF INDIVIDUALS

All reptiles and amphibians captured or observed to date have been identified to species (many to identifiable subspecies), and where possible, sexed, measured for length (snout to vent length is becoming the standard for measuring snakes, lizards and amphibians, while carapace length is used for turtles), weighed and checked for reproductive condition. All lengths are recorded in millimeters while weights are recorded in grams. Sexing of snakes is done by probing which has a 96% reliability rate. Lizards are sometimes harder to sex, but anal pores and display markings of males are helpful in this respect. Turtles are sexed by a combination of indented plastron of most male individuals and location of the vent in relation to the end of the shell. Frogs, toads and salamanders are hard to sex with any degree of reliability outside the breeding season.

RESULTS

Analysis of Species Richness and Relative Abundance

The following tables and text analyze the species richness and relative abundance of the reptiles and amphibians found on Chickamauga and Chattanooga National Military Park in two contexts; parkwide and at the habitat level. The numbers in the tables reflect the relative abundance of that species compared to other species within that assemblage. This number is acquired by dividing the number of individuals found by the number of sampling points located within that geographic area or habitat (Jones, 1988). These numbers reflect only the results of this inventory and do not include previous or concurrent studies on the Park.

Table 7: Species Richness Analysis

<u>Level of Analysis</u>	<u>Number of Species</u>
Parkwide	36
Habitats	
Mixed Hardwood Forest	11
Mixed Mesic Hardwoods	4
Juniper/Hardwood Forest	7
Pine/Hardwood Forest	13
Open Field	3
Cedar Glade	11
Rock Face	5
Pond	9
Spring	8
Stream	13
Ephemeral Pools	4

Table 8: Relative Abundance at Park Level

Species	Relative Abundance Factor
Spotted Salamander	.086
Spotted Dusky Salamander	.012
Southern Red-backed Salamander	.006
Zigzag Salamander	.019
Northern Slimy Salamander	.309
Spring Salamander	.006
Northern Red Salamander	.012
Southern Two-lined Salamander	.019
Longtail Salamander	.012
Cave Salamander	.105
American Toad	3.741
Fowler's Toad	.056
Northern Cricket Frog	.049
Cope's Gray Treefrog	.148
Spring Peeper	.012
Upland Chorus Frog	.043
Eastern Narrowmouth Toad	2.000
Bullfrog	.117
Green Frog	.222
Southern Leopard Frog	4.185

Species	Relative Abundance Factor
Pickerel Frog	.019
Common Snapping Turtle	.006
Eastern Box Turtle	.012
Hieroglyphic River Cooter	.204
Eastern Fence Lizard	.167
Ground Skink	.043
Five-lined Skink	.105
Midland Watersnake	.019
Eastern Garter Snake	.012
Smooth Earth Snake	.019
Ringneck Snake	.019
Eastern Worm Snake (Midwest)	.037
Rough Green Snake	.012
Rat Snake	.006
Black Kingsnake	.006
Copperhead	.012

Table 9: Relative Abundance by Terrestrial Habitats

Species	Mixed Hardwood Forest (39 Sites)	Mixed Mesic Hardwoods (14 Sites)	Juniper/Hardwood Forest (11 Sites)	Pine/Hardwood Forest (29 Sites)	Open Field (16 Sites)	Cedar Glade (9 sites)	Rock Face (4 Sites)
Spotted Salamander							
Spotted Dusky Salamander							
Southern Red-backed Salamander		.071					
Zigzag Salamander							
Northern Slimy Salamander	.282		1.818	.241		.666	1.250
Spring Salamander						.111	
Northern Red Salamander	.026					.111	
Southern Two-lined Salamander			.091				
Longtail Salamander						.111	.250
Cave Salamander							3.500
American Toad	.128			.034			
Fowler's Toad			.091	.103			

Species	Mixed Hardwood Forest (39 Sites)	Mixed Mesic Hardwoods (14 Sites)	Juniper/Hardwood Forest (11 Sites)	Pine/Hardwood Forest (29 Sites)	Open Field (16 Sites)	Cedar Glade (9 sites)	Rock Face (4 Sites)
Northern Cricket Frog				.069			
Cope's Gray Treefrog	.077			.103			
Spring Peeper				.069			
Upland Chorus Frog							
Eastern Narrowmouth Toad	.026			.138	.375	.444	
Bullfrog							
Green Frog							
Southern Leopard Frog				.552	.250		
Pickerel Frog							
Common Snapping Turtle							
Eastern Box Turtle		.071		.034			
Hieroglyphic River Cooter							
Eastern Fence Lizard	.026	.143	.091			2.222	
Ground Skink			.091	.034		.444	
Five-lined Skink	.205	.071		.034	.250	.111	
Midland Watersnake							
Eastern Garter Snake	.051						
Smooth Earth Snake	.026		.091	.034			
Ringneck Snake	.051						.250
Eastern Worm Snake (Midwest)	.026		.091			.444	
Rough Green Snake						.222	
Rat Snake							.250
Black Kingsnake						.111	
Copperhead				.069			

Table 10: Relative Abundance by Aquatic Habitats

Species	Pond (7 Sites)	Stream (19 Sites)	Spring (7 Sites)	Ephemeral Pond (7 Sites)
Spotted Salamander	2.000			
Spotted Dusky Salamander			.286	

Species	Pond (7 Sites)	Stream (19 Sites)	Spring (7 Sites)	Ephemeral Pond (7 Sites)
Southern Red-backed Salamander				
Zigzag Salamander			.429	
Northern Slimy Salamander		053		
Spring Salamander				
Northern Red Salamander				
Southern Two-lined Salamander		.105		
Longtail Salamander				
Cave Salamander			.429	
American Toad				85.714
Fowler's Toad				.714
Northern Cricket Frog	.571	.105		
Cope's Gray Treefrog	2.571			
Spring Peeper				
Upland Chorus Frog		.368		
Eastern Narrowmouth Toad	1.286			42.857
Bullfrog	2.571	.053		
Green Frog	4.429	.211	.143	
Southern Leopard Frog	5.714	.105	1.429	86.571
Pickerel Frog			.429	
Common Snapping Turtle		053		
Eastern Box Turtle				
Hieroglyphic River Cooter		1.737		
Eastern Fence Lizard			.429	
Ground Skink			.143	
Five-lined Skink	.143	.053		
Midland Watersnake	.143	.105		
Eastern Garter Snake				
Smooth Earth Snake				
Ringneck Snake				
Eastern Worm Snake (Midwest)				
Rough Green Snake				
Rat Snake				
Black Kingsnake				
Copperhead				

THREATENED AND ENDANGERED SPECIES AND SPECIES OF CONCERN

Chickamauga and Chattanooga National Military Park is located in Hamilton County, Tennessee and Walker, Catoosa and Dade Counties, Georgia. The federal Endangered Species Act (ESA) does not list any reptile or amphibian species located in that area as threatened or endangered. No individuals of Federally listed threatened, endangered or candidate species were located during this inventory.

The State of Tennessee lists the following species **threatened**.

Tennessee Cave Salamander	Northern Pine Snake
Bog Turtle	Western Pygmy Rattlesnake

Of these species only the Tennessee Cave Salamander and the Northern Pine Snake have distributions close to the area of this park. No individuals of any of these species were located during the course of this inventory, however, historical records of Tennessee Cave Salamanders exist for Lookout Mountain Cave within Chickamauga and Chattanooga National Military Park (Hobbs, 1994).

The State of Tennessee lists the following species as **wildlife in need of management**:

Black Mountain Dusky Salamander	Mole Salamander
Four-toed Salamander	Barking Treefrog
Janalaska Salamander	Eastern Slender Glass Lizard
Weller's Salamander	Green Anole
Wehrle's Salamander	Six-lined Racerunner
Seepage Salamander	Green Water Snake
Pygmy Salamander	Alligator Snapping Turtle
Black-bellied Salamander	

Of these species only the Four-toed Salamander, Black-bellied Salamander, Green Anole, Eastern Slender Glass Lizard and Six-lined Racerunner have distributions close to the area of this park in Tennessee. No individuals of any of these species were located during this inventory process. Suitable habitat does not exist for most of these species at the high altitudes encountered in the Tennessee portions of the Park.

The Tennessee Division of Natural Heritage is also monitoring the Green Salamander as a **Rare Species** in Hamilton County. No individuals of this species were noted in the course of this inventory, although there is some suitable habitat available on moist rock faces below Pointe Park.

In the vicinity of Walker County, Georgia no Federally or state listed reptile or amphibian species are known. However, the Green Salamander and Pigeon Mountain Salamander are both monitored by the Georgia Department of Natural Resources as **Species of Concern**. Both species are known from Walker County and habitat exists in the Georgia portions of

Chickamauga and Chattanooga National Military Park for both species. During the course of this inventory no individuals of either species were noted in the Park.

In the vicinity of Dade County, Georgia the Hellbender is listed as a Federally protected Partial Status species. The Green Salamander and Common Map Turtle are state protected **Species of Concern**. The Cave Salamander is being monitored in Dade County as a **rare** species by the Georgia Natural Heritage Database Program. No individuals of any of these species were located during this inventory process in the Dade County portions of the Park, although Cave Salamanders were quite common within the Walker County portions

In the Catoosa County vicinity the Hellbender is listed as a Federally protected Partial Status species. The Mudpuppy is being monitored in Catoosa County as a **rare** species by the Georgia Natural Heritage Database Program. No individuals of either of these species were located during this inventory process in the Catoosa County portions of the Park

DISCUSSION

During the course of this inventory process several potential sources of bias were noted. Weather nearly always creates some bias in herpetological survey. Because of the need for fairly exacting moisture and heat parameters by most reptile and amphibian species, some bias is certain to occur. During the time of our surveys, weather appeared to be within normal parameters for the area of the Park. Therefore, little bias would enter in to these survey results.

Another thing that became apparent was that randomly placed plots do not work well for reptiles and amphibians. They do work for birds, but, for more sedentary species, they do not seem to be of much value. Most reptiles and amphibians depend on fairly exacting microhabitats in which to live and randomly placed plots do not take this into account, thus leading to great inefficiency, especially as an inventory technique. This was borne out in other herpetological inventories conducted by Accipiter Biological Consultants including those on the Natchez Trace Parkway, Camp Dodge, Iowa Military Training Area, the Blue Ridge Parkway and now at Chickamauga and Chattanooga National Military Park. In all cases this technique utilized the most time and produced among the fewest individuals.

Past Herpetological Surveys of Chickamauga and Chattanooga National Military Park

During the course of research for this project one previous study was noted for this park. It was conducted by Horton H. Hobbs III dealing with ecological resources of the caves on Russell Cave National Monument and of the Chickamauga-Chattanooga National Military Park.

Hobbs listed several reptile and amphibian species located in or near the caves of the Lookout Mountain unit of Chickamauga and Chattanooga National Military Park. They include Eastern Box Turtle, Tennessee Cave Salamander, Cave Salamander and Northern Slimy Salamander. He also mentions *Rana pipiens* at Chickamauga and Chattanooga National Military Park. As of this writing *R. pipiens* is the Northern Leopard Frog. The type now found at the Park is *R. utricularia*, the Southern Leopard Frog. Taxonomists apparently split the Leopard Frog complex into a number of species in the late 1990's.

All species located by this study were also located on the present inventory except for the Tennessee Cave Salamander so one additional species was added to the annotated list by previous studies.

Anecdotal Observation Records

Anecdotal observations are those observations made by other people, outside the study, which may or may not be verified as to the true species observed. The usefulness of this type of data is limited and depends, to a great extent, on the experience of the observer. This being said, a number of species were reported to Accipiter Biological Consultants staff during the surveys by Park visitors and staff. The Northern Black Racer, Timber Rattlesnake, Eastern Hognose Snake, Spotted Dusky Salamander and Common Musk Turtle were reported to us in this manner. Habitat exists for all five species on the Park and all five would be within their currently mapped distribution. Four of the five were not located on this inventory so they will be added to the annotated list for the Park on the basis of these reports and their anecdotal nature is listed.

During the course of this study a number of NPS employees, especially maintenance workers and rangers, who are out on the Park daily, local inhabitants and visitors to the Park were interviewed in regards to reptile and amphibian species that they had observed on the Park. While this is not a reliable method of gaining information for a study of this type, several interesting conclusions could be drawn from the information.

1. Many local people fear all snakes and feel that all should be killed without delay.
2. Timber Rattlesnakes and snakes in general may have been more prevalent than survey methodologies led us to believe. Many were reported to us but few were found during the surveys.

Taxonomic Issues

Since the beginning of this project, all North American species in the Genus *Eumeces* have been changed to *Plestiodon*. This would include all species of skinks found on Chickamauga and Chattanooga National Military Park with the exception of the Ground Skink. Additionally, all lizards of the Genus *Cnemidophorus* residing in North America north of Mexico have been relegated to the Genus *Aspidoscelis*. These changes have been made, where appropriate, in this text.

Of interest to the ABC staff was the inclusion of *Rana pipiens* in the database of NPSpecies for Chickamauga and Chattanooga National Military Park. This inclusion may have arisen from the Hobbs report cited earlier. As was stated at that time, the notation should be changed to *R. utricularia* to reflect current taxonomy.

SUMMARY

During the course of this inventory 41 species of amphibians and reptiles were documented for Chickamauga and Chattanooga National Military Park. This 41 species equates to 82% of the 50 species on our original list which have preferred habitat on the Park. Of the original 50 species

the Marbled Salamander, Red-spotted Newt, Broadhead Skink, Northern Pine Snake, Brown Snake, Red-bellied Snake, Corn Snake, Mole Kingsnake and Southeastern Crowned Snake were not located. Potential habitat exists on the Park for all nine species so any of them could be found on the Park in the future. Little habitat exists for the Marbled Salamander and Red-spotted Newt and the best is the pond located at Random Plot # 3. This pond already sustains a population of Spotted Salamanders and competition may be keeping the other two species out. No unexpected species were located during the inventory. The Red-bellied Snake and Southeastern Crowned Snake are very fossorial species and, under the best of conditions, hard to inventory. They could both be present in numbers, but, go unknown because they spend only a small amount of time active on the surface. The Northern Pine Snake is at the extreme limit of its mapped distribution in the Park and, at best, would be very rare. The goal of documenting at least 90% of expected reptile and amphibian species was not met with this inventory, however, any of the above nine species could be added to the list at any time, as potential habitat does exist for them on the Park and the Park is within the published range of distribution for each species..

CONSERVATION AND MANAGEMENT RECOMMENDATIONS

Throughout history, many human activities have proven detrimental to the natural biota. As human populations increase, more and more natural habitat is eliminated or modified such that many species are now at risk. Several major threats to reptile and amphibian populations exist. The greatest include habitat destruction, modification of hydrologic controls that affect wetlands, pollution and collection for commercial or scientific purposes. The following are a series of conservation and management recommendations aimed at mitigating the effects of these threats on Chickamauga and Chattanooga National Military Park. These are not meant to be binding on the National Park Service, but rather recommendations for best management practices on the Park.

- As is the case with so many kinds of wildlife, reptiles and amphibians are under great pressure and they are rapidly disappearing from many areas where they were formerly abundant. This is due in the largest part to ignorance of the value of these animals, habitat destruction and exploitation for the pet trade. Current regulations of the National Park Service protect and manage all native wildlife within the National Park System lands. With this progressive attitude in mind, **land managers at Chickamauga and Chattanooga National Military Park should entirely eliminate the collection of native reptiles and amphibians, except as allowed by law through the scientific collecting permit process, and enforce laws relating to killing or harassing of these animals to the highest degree possible.**
- **All wetland areas should be managed to preserve, protect and, if necessary, restore natural functions in compliance with Executive Orders 11988 (requires agencies to preserve natural values served by floodplains) and 11990 (requires avoidance of adverse impacts associated with destruction or modification of wetlands), with the objective of minimizing degradation of stream banks and the loss of wetland habitat.**

- On several occasions the area of small streams or running ditches were mowed well into the wetland. Several small ephemeral ponds were also driven through or mowed over during mowing operations. This can have adverse affects on the hydrology of these wetlands which represents some of the best amphibian habitat on the Park. This mowing causes turbidity in the water, as well as opens the canopy of the marsh to more direct sunlight causing more rapid evaporation of the wetland. **Mowing should occur only up to, but not into the marshy area surrounding the ponds and streams.** In other words, if the tires are kicking up water, then, habitat damage is probably being done.
- **Avoid straightening or diverting sections of stream channel. These activities increase stream velocity and erosion, reduce streambank stability, and negatively affect upstream and downstream habitat.**
- **Disturbed wetland areas could be enhanced by revegetation with native plants around the wetland to control erosion and reduce nutrient inputs into the water.** All amphibians and many aquatic reptiles are adversely affected by impurities in the water. To this end **chemical pesticides and non-biodegradable herbicides should be avoided, especially within 300 feet of any wetland. They should be used only in conjunction with an established Integrated Pest Management Plan.**
- **Where appropriate sites and habitat types exist, especially where ephemeral pools have been drained or otherwise destroyed, consideration should be given to construction of additional ephemeral pools, in close consultation with herpetologists and botanists familiar with the native species of the area.** Sites should be carefully chosen, so as not to destroy other valuable resources, or disrupt natural drainage patterns. They are relatively easy to create and provide potential habitat for a majority of the *Ambystoma* salamander species and anurans occupying the Park. The book entitled A Guide to Creating Vernal Ponds by Tom Biebighauser is an excellent sourcebook. If the NPS cannot find a copy, Accipiter Biological Consultants will provide one at no cost. Inexpensive labor and machinery exist with the Planning, Operations and Training Offices of the Tennessee and Georgia Army National Guards. ABC has facilitated these cooperative efforts between military engineers and other National Parks and Forests and in each instance it produced a win-win situation. The engineers get excellent training on their equipment, the NPS gets new habitat built for the cost of allowing the troops to camp while they work and the wildlife gets additional habitat. ABC will gladly put NPS land managers in touch with the appropriate offices for this type of project.
- The following is recommended to further the success of the permanent wetlands on the Park for reptile and amphibian species. **Keep fish out of wetland areas, especially game fish, except for where nature provides them.** These fish are highly predatory on amphibian eggs and larvae. Large game fish are also capable of ingesting adult frogs or salamanders and young aquatic snakes and turtles. Many amphibian species will not breed where these species are present. Even small fish species are capable of making heavy inroads on amphibian eggs.

- While the wetlands on the Park appear to be in fair shape, they do not exist alone, but have hydrologic and biologic ties with the surrounding landscape. **Vegetative corridors should be provided or maintained where they exist between wetlands and surrounding upland areas. Land managers should encourage native vegetative diversity in all habitats located on the Park.**
- **Rights-of-way should be placed near current habitat edge areas to reduce fragmentation of larger blocks of pristine habitat. Avoid building roads or new trails parallel to streams in riparian zones or through wet meadows. Stream crossings should be at right angles to minimize impacts on riparian vegetation, streambanks, soils, and water quality.**
- **Activities that will interrupt ecosystem processes should be avoided, or an alternative location for the activity should be sought. For example, avoid fragmentation activities that will interrupt the water flow patterns in wetland communities or create barriers between connected habitats used by reptile and amphibian species. Roads and firebreaks that disrupt natural hydrologic and burn patterns in higher quality ecotones that serve as reptile and amphibian habitat should be reduced to the minimum level necessary to accomplish the NPS mission, with remaining ecotones being allowed to recover. Roads that transect ecotones should be stabilized to prevent unnecessary erosion impacts and fire ditches and breaks should be restored to the original grade to restore natural hydrologic patterns. Where hydrologic fragmentation has already occurred, the NPS should conduct studies on its effect on reptile and amphibian populations. These studies should be comparative, comparing the fragmented habitats to more pristine habitats on the Park.**
- No ecological benefits are gained by utilizing intensive site preparation activities that cause severe soil disturbance at sites. Therefore, **mechanical site preparation activities in susceptible areas should be minimal and restricted to nonmechanical approaches, if possible.** Intensive site preparation activities are known to lead to invasion by invasive exotic weedy species, and to exacerbate erosion problems.
- Whenever a building is removed on the Park, the following plan of action is recommended. This strategy has been adopted by several military reserves in the midwestern United States because agricultural land uses have reduced the habitat quality and potential hibernation sites for snakes and salamanders. This strategy may also prove helpful on Chickamauga and Chattanooga National Military Park lands. **When buildings are removed, the foundation should be filled with the loose debris and covered with soil to create a snake and salamander hibernaculum. This practice should be repeated whenever a building is demolished at isolated sites on the Park.** Costs for this practice would likely not be higher than hauling the debris away. **Also, agricultural crops and manicured lawns in the immediate vicinity of these sites could be replaced by native grasses and plants to provide for a higher diversity of plant life.**

- Hazards to reptile and amphibian species on the Park include automobile traffic and mowing of large, open areas of the Park lands. While there have been numerous studies made on the effects of traffic on herp movements, the NPS may wish to **investigate the effects of Park traffic on sedentary species such as woodland salamanders which make up a large percentage of the animal biomass in many areas of their ranges.** During the course of the initial inventory, box turtles were found dead as the result of run-ins with automobiles and mowers on the Park. When possible, **mowers should be set to cut not less than at an eight-inch height to avoid damaging or killing turtles and snakes utilizing the grassy areas of the Park.** The NPS should investigate the effects of mowing on home range and movement of herp species on the Park.
- During 2003-2005 a baseline inventory of the reptile and amphibian species was accomplished on Chickamauga and Chattanooga National Military Park. The results of this survey are included in this report. **In addition, a monitoring plan for reptile species should be developed. This monitoring plan should be implemented as soon as time, personnel and financial resources are available.**
- **Visitors and employees at Chickamauga and Chattanooga National Military Park should be encouraged to leave microhabitats intact. Rocks, logs, boards and other ground debris should be replaced when disturbed.** These microhabitats form a large share of the usable reptile and amphibian habitat on Park lands. This encouragement could potentially come in the form of notices on Park maps, literature and bulletin boards currently located at a number of pullovers throughout the Park. Brief statements prior to or following the Park film shown in the Visitors Center could also be utilized. These same sources could also be used to **educate visitors and employees on the usefulness of these animals, and to prohibit the harassment of reptiles, amphibians and other native wildlife on Chickamauga and Chattanooga National Military Park.**

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APPENDIX A

CHCH FIELD DATASHEETS

APPENDIX A KEY

HAB = Habitat

MF = Mixed Hardwood Forest
MH = Mixed Mesic Hardwoods
PH = Pine/Hardwood Forest
JH = Juniper/Hardwood Forest
CG = Cedar Glade
OF = Open Field
EP = Ephemeral Pool
SP = Spring
ST = Stream
PO = Pond
RF = Rock Faces

SKY = Cloud Cover

0 = Clear or few clouds
1 = Partly cloudy or variable
2 = Cloudy or overcast
4 = Fog or smoke
5 = Drizzle
7 = Snow
8 = Showers

RAIN = Rainfall in last 24 hours

Y = Yes
N = No

= Number of individuals found

AGE

A = Adult
J = Juvenile
L = Larval Stage
U = Unknown

SEX

M = Male
F = Female
U = Unknown
S to V = Snout to Vent Length in mm.

WT = Weight in Grams

* = not weighed

Audio Frog Surveys

HEARD

1 = One frog calling
2 = Two frogs calling
3 = Three frogs calling
4 = Chorus of frogs calling

CHCH GENERAL COLLECTING DATASHEET

DATE	SITE #	HAB	SKY	TEMP	RAIN	SPECIES	#	AGE	SEX	S to V	WT	NOTES
09/13/03	G 15	MH	0	74	N	SMOOTH EARTH SNAKE	1	A	F	243	11.5	PIC 1
09/14/03	R 20	CG	5	72	Y	BLACK KING SNAKE	1	A	F	736	193.0	PIC 4
09/14/03	R 20	CG	5	72	Y	EASTERN FENCE LIZARD	6	J	U	29	0.5	
09/14/03	R 20	CG	5	72	Y	GROUND SKINK	1	A	M	42	1.5	
09/14/03	R 20	CG	5	72	Y	FIVE-LINED SKINK	1	J	U	36	1.0	
09/14/03	M 1	ST	5	72	Y	SOUTHERN TWO-LINED SALAMANDER	1	A	U	32	0.5	
09/14/03	M 1	ST	5	72	Y	GREEN FROG	3	A	U	48	1.5	
09/14/03	G 5	ST	5	74	Y	FIVE-LINED SKINK	1	J	U	*	*	OBSERVED
09/14/03	G 5	ST	5	74	Y	HIEROGLYPHIC RIVER COOTER	1	A	F	*	*	SUNNING
09/14/03	M 1	RF	5	72	Y	LONGTAIL SALAMANDER	1	A	U	*	*	OBSERVED
09/14/03	G 11	SP	2	73	Y	SOUTHERN LEOPARD FROG	4	A	U	67	11.0	PIC 29
04/02/04	R 8	MH	2	72	N	NORTHERN SLIMY SALAMANDER	1	A	U	52	2.5	PIC 5
04/02/04	R 6	MH	2	72	N	NORTHERN SLIMY SALAMANDER	1	A	U	72	10.0	
04/02/04	M 1	EP	1	71	N	AMERICAN TOAD	600	L	U	*	*	
04/02/04	G 4	CG	2	67	N	EASTERN WORM SNAKE (MIDWEST)	1	A	M	196	4.0	PIC 6
04/02/04	G 4	CG	1	59	N	EASTERN WORM SNAKE (MIDWEST)	1	A	F	157	3.0	
04/02/04	R 21	CG	1	59	N	EASTERN NARROW-MOUTHED TOAD	1	A	U	29	1.5	PIC 7
04/02/04	R 21	CG	1	59	N	NORTHERN RED SALAMANDER	1	A	U	96	13.0	PIC 8
04/02/04	G 4	CG	1	59	N	NORTHERN SLIMY SALAMANDER	1	J	U	*	*	
04/02/04	G 1	PH	0	63	N	EASTERN FENCE LIZARD	8	J	U	39	1.5	PIC 9
04/03/04	R 17	PH	0	71	N	SMOOTH EARTH SNAKE	1	A	F	202	9.0	
04/03/04	D 1	JH	0	71	N	NORTHERN SLIMY SALAMANDER	2	J	U	99	0.5	
04/03/04	D 1	JH	0	71	N	EASTERN WORM SNAKE (MIDWEST)	1	A	F	229	8.5	
04/04/04	G 11	SP	0	62	N	NORTHERN SLIMY SALAMANDER	1	A	U	64	7.0	
04/04/04	G 11	SP	0	62	N	ZIGZAG SALAMANDER	1	A	U	22	*	PIC 10
04/04/04	G 15	MF	0	60	N	EASTERN FENCE LIZARD	1	A	U	*	*	OBSERVED
04/05/04	G 4	JH	0	51	N	SOUTHERN RED-BACKED SALAMANDER	1	A	U	30	0.5	
04/05/04	G 5	ST	0	54	N	EASTERN FENCE LIZARD	1	J	U	33	1.0	
04/05/04	M 1	SP	0	57	N	HIEROGLYPHIC RIVER COOTER	2	A	U	*	*	SUNNING
04/05/04	M 1	SP	0	61	N	ZIGZAG SALAMANDER	1	J	U	9	*	SPOTTED
06/25/04	R 20	PH	8	73	Y	ZIGZAG SALAMANDER	1	A	U	30	0.5	
06/25/04	M 1	RF	8	76	Y	NORTHERN SLIMY SALAMANDER	1	J	U	42	1.5	
06/25/04	R 21	CG	8	72	Y	CAVE SALAMANDER	1	A	U	*	*	OBSERVED
06/25/04	R 13	PH	8	72	Y	NORTHERN SLIMY SALAMANDER	1	J	U	44	2.0	
06/25/04	R 3	PO	8	72	Y	NORTHERN SLIMY SALAMANDER	1	J	U	36	1.0	
06/26/04	M 1	SP	2	76	Y	SPOTTED SALAMANDER	3	L	U	40	3.0	
06/26/04	G 9	OF	1	77	Y	CAVE SALAMANDER	3	A	U	42	1.0	
06/26/04	M 1	MH	2	76	Y	FIVE-LINED SKINK	1	A	M	67	7.0	PIC 15
06/26/04	G 21	RF	2	76	Y	NORTHERN SLIMY SALAMANDER	1	J	U	40	1.5	
06/26/04	G 21	RF	2	76	Y	CAVE SALAMANDER	1	A	U	*	*	OBSERVED
06/26/04	G 22	OF	2	76	Y	NORTHERN SLIMY SALAMANDER	1	A	U	*	*	OBSERVED
06/26/04	G 22	OF	2	76	Y	FIVE-LINED SKINK	1	A	U	*	*	OBSERVED

CHCH GENERAL COLLECTING DATASHEET

DATE	SITE #	HAB	SKY	TEMP	RAIN	SPECIES	#	AGE	SEX	S to V	WT	NOTES
06/26/04	G23	OF	2	76	Y	FIVE-LINED SKINK	1	A	U	*	*	OBSERVED
06/26/04	G22	EP	2	81	Y	EASTERN NARROW-MOUTHED TOAD	300+	L	U	23	0.5	
06/26/04	G5	ST	1	83	Y	HIEROGLYPHIC RIVER COOTER	4	A	U	*	*	OBSERVED
06/26/04	R20	CG	1	80	Y	EASTERN NARROW-MOUTHED TOAD	2	A	U	28	0.5	
06/26/04	R20	CG	1	80	Y	GROUND SKINK	1	A	U	*	*	OBSERVED
06/27/04	G14	MH	2	76	Y	EASTERN WORM SNAKE (MIDWEST)	1	J	F	97	1.0	
06/27/04	G18	MH	5	81	Y	RING-NECKED SNAKE	1	A	F	244	6.5	PIC 14
06/27/04	G14	PH	8	79	Y	COPE'S GRAY TREEFROG	1	A	U	42	1.0	PIC 16
06/27/04	G17	SP	8	78	Y	SPOTTED DUSKY SALAMANDER	1	L	U	22	0.5	
06/27/04	G17	MH	8	78	Y	AMERICAN TOAD	1	L	U	25	1.5	
06/27/04	G13	MH	8	78	Y	AMERICAN TOAD	1	A	U	28	1.5	PIC 13
09/09/04	M2	RF	0	82	N	CAVE SALAMANDER	1	A	U	*	*	OBSERVED
09/09/04	M2	SP	0	82	N	PICKEREL FROG	2	A	U	46	8.0	PIC 24
09/09/04	G21	RF	0	82	N	RAT SNAKE	1	A	F	530	120.0	
09/09/04	R17	JH	0	81	N	NORTHERN SLIMY SALAMANDER	5	A	U	43	0.5	
09/09/04	G4	JH	0	80	N	SOUTHERN TWO-LINED SALAMANDER	1	A	U	44	1.5	PIC 2
09/09/04	G4	JH	0	79	N	NORTHERN SLIMY SALAMANDER	2	A	U	74	7.5	
09/09/04	G21	RF	0	66	N	NORTHERN SLIMY SALAMANDER	2	A	U	70	7.0	
09/10/04	G13	MH	0	74	N	NORTHERN RED SALAMANDER	1	A	U	73	8.0	SAWDUST PILE
09/10/04	G20	ST	0	77	N	HIEROGLYPHIC RIVER COOTER	9	A	U	*	*	4 JUV.
09/10/04	D11	ST	0	77	N	HIEROGLYPHIC RIVER COOTER	7	A	U	*	*	LOWER TRUCK RD.
09/10/04	D11	MH	0	77	N	EASTERN FENCE LIZARD	1	A	U	*	*	LOWER TRUCK RD.
09/10/04	D11	ST	0	77	N	SNAPPING TURTLE	1	J	U	*	*	LOWER TRUCK RD.
09/11/04	M5	PO	0	77	N	BULLFROG	5	A	M	142	72.0	4 LARVAL PIC 26
09/11/04	M5	PO	0	69	N	FIVE-LINED SKINK	1	J	U	*	*	OBSERVED
09/11/04	G27	OF	1	80	N	FIVE-LINED SKINK	1	J	U	*	*	OBSERVED
09/11/04	G5	ST	1	80	N	HIEROGLYPHIC RIVER COOTER	2	A	U	*	*	OBSERVED
09/11/04	M2	RF	1	79	N	CAVE SALAMANDER	2	A	U	*	*	OBSERVED
09/11/04	G5	ST	1	76	N	NORTHERN SLIMY SALAMANDER	1	A	U	65	6.5	
09/12/04	R20	CG	2	76	N	ROUGH GREEN SNAKE	2	J	M	119	1.0	PIC NOT NUMBERED
09/12/04	R20	CG	2	76	N	LONGTAIL SALAMANDER	1	A	U	52	2.5	PIC 27
09/12/04	R20	CG	2	77	N	NORTHERN SLIMY SALAMANDER	1	A	U	56	1.5	
09/12/04	R20	CG	2	77	N	SPRING SALAMANDER	1	A	U	62	4.5	PIC 18
09/12/04	G1	JH	2	77	N	SMOOTH EARTH SNAKE	1	A	F	214	5.0	
09/12/04	M2	RF	2	81	N	CAVE SALAMANDER	1	A	U	44	1.0	PIC 28
09/12/04	G17	SP	2	80	N	SPOTTED DUSKY SALAMANDER	1	A	U	44	2.5	PIC 17
06/23/05	M5	PO	0	81	N	COPE'S GRAY TREEFROG	2	L	U	18	1.0	CALLING IN AREA
06/23/05	M5	PO	0	81	N	COPE'S GRAY TREEFROG	2	L	U	41	1.0	
06/23/05	M1	MF	0	82	N	EASTERN BOX TURTLE	1	A	F	124	455.0	
06/23/05	G10	PH	0	88	N	GROUND SKINK	1	A	U	66	8.0	
06/23/05	G10	PH	0	88	N	FIVE-LINED SKINK	1	A	U	66	8.0	
06/23/05	G10	PH	0	88	N	COPPERHEAD	1	A	U	*	*	OBSERVED

CHCH GENERAL COLLECTING DATASHEET

DATE	SITE #	HAB	SKY	TEMP	RAIN	SPECIES	#	AGE	SEX	S to V	WT	NOTES
06/23/05	R22	PH	0	89	N	NORTHERN SLIMY SALAMANDER	1	J	U	32	0.5	
06/23/05	G5	ST	0	92	N	HIEROGLYPHIC RIVER COOTER	3	A	U	*	*	OBSERVED
06/23/05	G4	JH	0	92	N	NORTHERN SLIMY SALAMANDER	2	J	U	36	0.5	
06/23/05	G4	JH	0	92	N	GROUND SKINK	1	A	U	41	1	
06/23/05	G8	EP	0	92	N	SOUTHERN LEOPARD FROG	300	L	U	11	0.5	
06/24/05	G6	ST	0	87	N	MIDLAND WATERSNAKE	1	J	F	396	41.0	
06/24/05	R8	CG	0	87	N	NORTHERN SLIMY SALAMANDER	1	J	U	36	0.5	
06/24/05	R20	CG	0	87	N	EASTERN NARROW-MOUTHED TOAD	1	A	U	31	0.5	
06/24/05	R21	MH	0	88	N	RING-NECKED SNAKE	1	A	M	231	5.0	
06/24/05	R21	MH	0	88	N	EASTERN NARROW-MOUTHED TOAD	1	A	U	28	0.5	
06/24/05	R21	MH	0	88	N	NORTHERN SLIMY SALAMANDER	2	J	U	33	0.5	
06/24/05	D1	MH	0	89	N	NORTHERN SLIMY SALAMANDER	3	J	U	29	1	
06/24/05	R40	MF	0	87	N	EASTERN FENCE LIZARD	2	A	M	86	12.0	
06/25/05	R3	PO	2	82	N	COPE'S GRAY TREEFROG	7	L	U	18	0.5	
06/25/05	R3	PO	2	82	N	GREEN FROG	10	L	U	18	0.5	3 ADULT
06/25/05	R3	PO	2	82	N	SPOTTED SALAMANDER	3	L	U	37	1.0	
06/25/05	R3	PO	1	82	N	EASTERN NARROW-MOUTHED TOAD	1	L	U	15	0.5	
06/25/05	M1	ST	1	85	N	SOUTHERN TWO-LINED SALAMANDER	1	A	U	42	1.0	
06/25/05	M1	ST	1	85	N	BULLFROG	1	A	U	*	*	OBSERVED
06/25/05	M2	RF	1	85	N	CAVE SALAMANDER	7	A	U	*	*	OBSERVED
06/25/05	M2	RF	1	85	N	NORTHERN SLIMY SALAMANDER	2	A	U	*	*	OBSERVED
06/25/05	G21	RF	1	86	N	RING-NECKED SNAKE	1	A	U	*	*	OBSERVED
06/26/05	M1	EP	1	86	N	SOUTHERN LEOPARD FROG	300	L	U	12	0.5	
06/26/05	G14	MF	5	82	Y	FIVE-LINED SKINK	1	A	M	*	*	OBSERVED
06/26/05	G12	MH	5	82	Y	FIVE-LINED SKINK	8	J	U	26	1	2 ADULTS (NEST)
06/26/05	D11	ST	2	84	Y	HIEROGLYPHIC RIVER COOTER	3	A	U	*	*	OBSERVED
06/26/05	G11	SP	2	84	Y	EASTERN FENCE LIZARD	2	A	F	76	8.0	
06/26/05	G11	SP	2	84	Y	SOUTHERN LEOPARD FROG	4	A	U	22	1.5	
06/26/05	R25	MH	5	82	Y	EASTERN GARTER SNAKE	1	A	F	533	62.0	
06/26/05	R25	MH	5	82	Y	NORTHERN SLIMY SALAMANDER	2	J	U	32	0.5	
09/01/05	M1	RF	0	87	N	CAVE SALAMANDER	1	A	U	*	*	OBSERVED
09/01/05	M2	SP	0	87	N	SOUTHERN LEOPARD FROG	2	A	U	23	1.5	
09/01/05	M2	SP	0	87	N	PICKEREL FROG	1	A	U	27	2.0	
09/01/05	G1	CG	0	87	N	NORTHERN SLIMY SALAMANDER	1	A	U	46	1.0	
09/01/05	M3	ST	0	87	N	NORTHERN CRICKET FROG	2	A	U	24	0.5	PIC 25
09/02/05	G11	SP	0	86	N	GROUND SKINK	1	A	U	40	0.5	
09/02/05	R36	ST	0	74	N	HIEROGLYPHIC RIVER COOTER	1	A	U	*	*	SUNNING
09/02/05	D12	MH	0	74	N	AMERICAN TOAD	3	A	U	36	5.5	
09/02/05	D11	ST	0	75	N	HIEROGLYPHIC RIVER COOTER	1	A	U	*	*	OBSERVED

CHCH RANDOM PLOT DATASHEET

DATE	SITE #	HAB	SKY	TEMP	RAIN	SPECIES	#	AGE	SEX	S to V	WT	NOTES
06/25/04	R20	PH	8	73	Y	NORTHERN SLIMY SALAMANDER	1	J	U	42	1.5	
06/25/04	R3	PO	8	75	Y	GREEN FROG	3	L	U	11	0.5	
06/25/04	R3	PO	8	75	Y	COPE'S GRAY TREEFROG	9	L	U	17	1.0	
06/25/04	R3	PO	8	75	Y	SPOTTED SALAMANDER	3	L	U	34	1.0	
06/25/04	R3	PO	8	75	Y	BULLFROG	1	L	U	41	19.0	
09/09/04	R21	CG	0	80	N	FENCE LIZARD	6	J	U	32	1.0	
09/09/04	R21	CG	0	80	N	WORM SNAKE (MIDWEST)	2	J	F	94	0.5	
09/09/04	R21	CG	0	80	N	GROUND SKINK	2	A	U	42	2.0	1 JUV. PIC 30 of adult
09/04/04	R22	PH	0	78	N	NORTHERN SLIMY SALAMANDER	1	A	U	67	7.5	
06/24/05	R12	JH	0	90	N	NORTHERN SLIMY SALAMANDER	1	J	U	37	1.0	
09/01/05	R17	JH	0	84	N	NORTHERN SLIMY SALAMANDER	2	A	U	48	1.5	
09/01/05	R21	CG	0	85	N	NORTHERN SLIMY SALAMANDER	1	J	U	38	1.0	

CHCH MINNOW TRAP DATASHEET

DATE	SITE #	HAB	SKY	TEMP	RAIN	SPECIES	#	AGE	SEX	S to V	WT	NOTES
09/11/04	M5	PO	0	69	N	MIDLAND WATERSNAKE	1	J	M	373	36.0	PIC 21
09/11/04	M5	PO	0	69	N	BULLFROG	2	L	U	48	23.0	
09/11/04	M1	ST	0	75	N	GREEN FROG	1	A	U	62	16.0	PIC 3
09/11/04	M2	SP	0	75	N	GREEN FROG	1	A	U	69	38.0	
09/12/04	M5	PO	2	79	N	GREEN FROG	2	L	U	28	1.5	
09/12/04	M5	PO	2	79	N	SPOTTED SALAMANDER	3	L	U	35	1.0	
06/25/05	M5	PO	2	82	N	GREEN FROG	3	J	U	34	4.0	
06/25/05	M5	PO	2	82	N	SOUTHERN LEOPARD FROG	8	L	U	27	3.5	
06/26/05	M5	PO	5	79	N	GREEN FROG	3	J	U	39	5.0	
09/01/05	M5	PO	0	81	N	SOUTHERN LEOPARD FROG	27	L	U	8	0.5	
09/01/05	M5	PO	0	81	N	BULLFROG	7	L	U	41	16.0	
09/03/05	G6	ST	0	65	N	MIDLAND WATERSNAKE	1	J	M	306	14.5	
09/03/05	M5	PO	0	65	N	GREEN FROG	7	L	U	10	0.5	
09/03/05	M5	PO	0	65	N	SOUTHERN LEOPARD FROG	4	L	U	10	0.5	

CHCH DRIFT FENCE DATASHEET

DATE	SITE #	HAB	SKY	TEMP	RAIN	SPECIES	#	AGE	SEX	S to V	WT	NOTES
09/10/04	D12	MH	0	78	N	EASTERN GARTER SNAKE	1	A	M	508	54.0	PIC 23
09/10/04	D12	MH	0	78	N	NORTHERN SLIMY SALAMANDER	1	A	U			OBSERVED
06/24/05	D1	JH	0	89	N	NORTHERN SLIMY SALAMANDER	2	A	U	62	5.0	
09/01/05	D1	JH	0	84	N	NORTHERN SLIMY SALAMANDER	5	J	U	39	1.0	

CHCH ANURAN AUDIO DATASHEET

DATE	SITE #	HAB	SKY	TEMP	RAIN	SPECIES	#	NOTES
04/03/04	M4	ST	0	71	N	UPLAND CHORUS FROG	2	
04/03/04	G2	ST	0	71	N	UPLAND CHORUS FROG	2	
04/03/04	M5	ST	0	69	N	UPLAND CHORUS FROG	3	
06/25/04	R20	PO	8	75	Y	GREEN FROG	3	
06/25/04	R20	PO	8	75	Y	BULLFROG	3	
06/25/04	R20	PO	8	75	Y	NORTHERN CRICKET FROG	4	
06/25/04	G6	PO	8	75	Y	EASTERN NARROW-MOUTHED TOAD	4	
06/25/04	G6	PO	8	75	Y	SOUTHERN LEOPARD FROG	1	
06/25/04	G7	PO	8	78	Y	EASTERN NARROW-MOUTHED TOAD	4	
06/25/04	G8	OF	8	72	Y	EASTERN NARROW-MOUTHED TOAD	4	
06/25/04	M4	MH	8	72	Y	COPE'S GRAY TREEFROG	3	
06/26/04	G24	OF	1	72	Y	EASTERN NARROW-MOUTHED TOAD	2	
06/26/04	G8	EP	1	72	Y	SOUTHERN LEOPARD FROG	2	
06/26/04	G8	EP	1	70	Y	FOWLER'S TOAD	4	
06/26/04	M2	PH	1	70	Y	SPRING PEEPER	2	
06/26/04	M2	PH	1	70	Y	EASTERN NARROW-MOUTHED TOAD	4	
06/26/04	M2	PH	1	70	Y	SOUTHERN LEOPARD FROG	4	
06/26/04	G21	PH	1	70	Y	SOUTHERN LEOPARD FROG	4	
06/26/04	G26	PH	1	70	Y	SOUTHERN LEOPARD FROG	4	
06/26/04	G26	PH	1	70	Y	NORTHERN CRICKET FROG	2	
06/27/04	G14	PH	8	79	Y	COPE'S GRAY TREEFROG	2	
06/23/05	G2	ST	1	80	N	SOUTHERN LEOPARD FROG	2	
06/23/05	R14	PH	1	80	N	SOUTHERN LEOPARD FROG	4	
06/23/05	G8	EP	1	80	N	SOUTHERN LEOPARD FROG	4	
06/23/05	G6	OF	1	79	N	SOUTHERN LEOPARD FROG	4	

APPENDIX B

**ANNOTATED
CHECKLIST
OF THE REPTILE
AND
AMPHIBIAN SPECIES
OF
CHICKAMAUGA AND
CHATTANOOGA
NATIONAL MILITARY
PARK**

ANNOTATED REPTILE AND AMPHIBIAN CHECKLIST KEY

Native

N = Native to CHCH -- Native; includes endemic or indigenous

I = Introduced to CHCH

Park Status

P = Present-- Extremely high confidence in park; Current, verifiable evidence exists; Extant.

PP = Probably Present-- Very high confidence in park; Verifiable evidence may exist, but not current; Park within range; Appropriate habitat exists; Adjacent to park.

H = Historical-- Extremely low confidence in park; Verifiable evidence exists but not current.

U = Unconfirmed-- Very low to high confidence in park; Verifiable evidence may exist, but not current or insufficient.

? = Unknown

Residency

R = Resident on the Park

B = Positive Breeder on the Park—Reproduces.

U = Unknown

Abundance

A = Abundant-- Large numbers; Habitats covering large portion of park.

C = Common-- Large numbers; Habitats not covering large portion of park.

U = Uncommon-- Few to moderate numbers; Sporadic; Habitats uncommon in park.

R = Rare-- Few individuals; Habitats rare.

? = Unknown

Previous Studies

H = Hobbs (1994)

Voucher Exists

P = Photographic voucher obtained during this study

Other

A = Anecdotal record for the Park

ANNOTATED REPTILE AND AMPHIBIAN CHECKLIST	NATIVE	PARK STATUS	RESIDENCY	ABUNDANCE	FOUND 2003/2005	PREVIOUS STUDIES	VOUCHER THIS STUDY	OTHER
Order Caudata - Salamanders								
Ambystomatidae – Mole Salamanders								
Spotted Salamander - <i>Ambystoma maculatum</i>	N	P	B	C	X			
Plethodontidae – Lungless Salamanders								
Spotted Dusky Salamander - <i>Desmognathus conanti</i>	N	P	B	U	X		P	A
Southern Red-back Salamander - <i>Plethodon serratus</i>	N	P	R	U	X			
Zigzag Salamander – <i>Plethodon dorsalis</i>	N	P	B	C	X		P	
Northern Slimy Salamander – <i>Plethodon glutinosus</i>	N	P	B	A	X	H	P	
Spring Salamander - <i>Gyrinophilus porphyriticus</i>	N	P	R	U	X		P	
Tennessee Cave Salamander – <i>Gyrinophilus pallescens</i>	N	PP	U	?		H		
Northern Red Salamander - <i>Pseudotriton ruber ruber</i>	N	P	R	U	X		P	
Southern Two-lined Salamander - <i>Eurycea cirrigera</i>	N	P	R	C	X		P	
Longtail Salamander – <i>Eurycea longicauda</i>	N	P	R	U	X		P	
Cave Salamander – <i>Eurycea lucifuga</i>	N	P	R	C	X	H	P	
Order Anura – Frogs and Toads								
Bufonidae – True Toads								
American Toad - <i>Bufo americanus</i>	N	P	B	A	X		P	
Fowler's Toad - <i>Bufo woodhousii fowleri</i>	N	P	B	C	X		P	
Hylidae – Treefrogs and Allies								
Northern Cricket Frog - <i>Acris crepitans</i>	N	P	B	C	X		P	
Cope's Gray Treefrog - <i>Hyla chrysoscelis</i>	N	P	B	C	X		P	
Spring Peeper - <i>Hyla crucifer</i>	N	P	B	U	X			
Upland Chorus Frog - <i>Pseudacris triseriata</i>	N	P	B	C	X			

ANNOTATED REPTILE AND AMPHIBIAN CHECKLIST	NATIVE	PARK STATUS	RESIDENCY	ABUNDANCE	FOUND 2003/2005	PREVIOUS STUDIES	VOUCHER THIS STUDY	OTHER
Microhylidae – Narrowmouth Toads								
Eastern Narrowmouth Toad – <i>Gastrophryne carolinensis</i>	N	P	B	A	X		P	
Ranidae – True Frogs								
Bullfrog - <i>Rana catesbeiana</i>	N	P	B	C	X		P	
Green Frog - <i>Rana clamitans melanota</i>	N	P	B	A	X		P	
Southern Leopard Frog – <i>Rana utricularia</i>	N	P	B	A	X	H	P	
Pickerel Frog – <i>Rana palustris</i>	N	P	R	U	X		P	
Order Testudines - Turtles								
Chelydridae – Snapping Turtles								
Common Snapping Turtle - <i>Chelydra serpentina</i>	N	P	B	U	X			
Kinosternidae – Musk and Mud Turtles								
Eastern Musk Turtle- <i>Sternotherus odoratus</i>	N	P	U	?				A
Emydidae – Box and Water Turtles								
Eastern Box Turtle - <i>Terrapene carolina carolina</i>	N	P	B	U	X	H	P	
Hieroglyphic River Cooter – <i>Pseudemys concinna hieroglyphica</i>	N	P	R	C	X			
Order Squamata – Lizards and Snakes								
Suborder Lacertilia – Lizards								
Phrynosomatidae – Spiny Lizards and Allies								
Eastern Fence Lizard - <i>Sceloporus undulatus</i>	N	P	B	A	X		P	
Scincidae – Skinks								
Five-lined Skink - <i>Plestiodon fasciatus</i>	N	P	B	C	X		P	
Ground Skink – <i>Scincella lateralis</i>	N	P	R	C	X		P	
Suborder Serpentes - Snakes								
Colubridae – Colubrids								
Midland Watersnake - <i>Nerodia sipedon pleuralis</i>	N	P	B	C	X		P	

ANNOTATED REPTILE AND AMPHIBIAN CHECKLIST	NATIVE	PARK STATUS	RESIDENCY	ABUNDANCE	FOUND 2003/2005	PREVIOUS STUDIES	VOUCHER THIS STUDY	OTHER
Eastern Garter Snake - <i>Thamnophis sirtalis</i>	N	P	R	U	X		P	
Smooth Earth Snake – <i>Virginia valeriae</i>	N	P	R	U	X		P	
Eastern Hognose Snake – <i>Heterodon platirhinos</i>	N	PP	U	?				A
Ring-necked Snake - <i>Diadophis punctatus</i>	N	P	R	U	X		P	
Eastern (Midwest)Worm Snake - <i>Carphophis amoenus helenae</i>	N	P	B	C	X		P	
Northern Black Racer - <i>Coluber constrictor constrictor</i>	N	PP	U	?				A
Rough Green Snake - <i>Opheodrys aestivus</i>	N	P	B	U	X		P	
Rat Snake - <i>Elaphe obsoleta</i>	N	P	R	U	X			
Black Kingsnake – <i>Lampropeltis getula nigra</i>	N	P	R	U	X		P	
Viperidae - Vipers								
Crotalinae – Pit Vipers								
Copperhead - <i>Agkistrodon contortrix</i>	N	P	R	U	X		P	
Timber Rattlesnake - <i>Crotalus horridus</i>	N	PP	U	?				A

APPENDIX C

**LIFE HISTORY
INFORMATION
OF THE REPTILE AND
AMPHIBIAN SPECIES
OF
CHICKAMAUGA AND
CHATTANOOGA
NATIONAL MILITARY
PARK**

SPOTTED SALAMANDER

(Ambystoma maculatum)

Status:

Common.

Distribution and Habitat:

This species inhabits forested areas with nearby ponds throughout the Park.

Special Habitat Requirements:

Requirements include shallow water bodies in which to breed and moist areas in which to hide.

Breeding:

Breeds February through April. Females normally deposit 2-4 egg masses containing 1-250 eggs each. Incubation is 3-4 weeks with metamorphosis occurring at 6-16 weeks.

Food Habits:

This species will eat any insect or invertebrate it can fit into its mouth.

Other Information

This species is often found in small pools within the Park. In most cases, the spent egg masses are more noticeable than the salamander or its larvae. Adults seen primarily during early spring breeding period.

SPOTTED DUSKY

SALAMANDER

(Desmognathus conanti)

Status:

Uncommon.

Distribution and Habitat:

Occupies edges of small woodland streams, brooks, springs and seepage areas over the entire Park. Seldom wanders far from running or trickling water.

Special Habitat Requirements:

Requirements include running waterways with stones, chunks of wood or other miscellaneous debris to provide shelter for the salamanders and their food.

Breeding:

Breeding takes place in the spring and eggs are deposited in small clusters under stones or logs near water where the female stays curled around them until they hatch. The aquatic larval period lasts from 2-8 months

Food Habits:

The diet consists of small arthropods including snails, earthworms, beetles and flies.

Other Information

Usually seen in many of the small streams within the Park. Particularly noticeable in streams or seeps with good leaf beds.

**SOUTHERN RED-BACK
SALAMANDER**
(*Plethodon serratus*)

Status:

Uncommon.

Distribution and Habitat:

This species lives under rocks, leaf litter and rotten logs in forested areas.

Special Habitat Requirements:

Requirements include forested areas with rocks, logs or other debris under which these animals can hide.

Breeding:

Little is known of the breeding and reproductive strategies of this species. Females are presumed to lay eggs in underground burrows. Embryos hatch in late summer.

Food Habits:

The diet consists of small invertebrates including beetles, flies, ants and spiders.

Other Information

This species was located in forest debris at the side of a stream.

ZIGZAG SALAMANDER
(*Plethodon dorsalis*)

Status:

Common.

Distribution and Habitat:

This species inhabits seepages near rock outcroppings on slopes in mixed hardwood forests.

Special Habitat Requirements:

Requirements include talus slopes, rocky hillsides and other habitats with rocky substrates in mesic forests.

Breeding:

Breeding occurs from fall to midspring. Females deposit 1-10 eggs in underground retreats in late spring or early summer and attend them until hatching some 90 days later. The young are miniature replicas of the adults and are terrestrial.

Food Habits:

This species eats primarily spiders, beetles, mites and other small arthropods.

Other Information

Look for this species in appropriate habitats in the Lookout Mountain portions of the Park.

**NORTHERN SLIMY
SALAMANDER**
(*Plethodon glutinosus*)

Status:

Abundant.

Distribution and Habitat:

This species inhabits moist woodland habitats which are not susceptible to flooding. They should be found throughout the Park.

Special Habitat Requirements:

This species generally requires more moisture than other salamanders of this genus.

Breeding:

Eggs are laid in late summer or fall in or under logs and among roots. Young do not have an aquatic stage.

Food Habits:

Invertebrates including earthworms, beetles and ants are the mainstay of the diet.

Other Information

This species is often found by turning logs or flat rocks in their preferred habitat.

SPRING SALAMANDER
(*Gyrinophilus porphyriticus*)

Status:

Uncommon.

Distribution and Habitat:

This species inhabits springs and other small, cold, rocky streams throughout the Park.

Special Habitat Requirements:

Requirements include small fish free running water sources with rocks or leaf beds under which the salamanders may hide.

Breeding:

Breeding is little studied. Females attach 20-60 eggs to the lower surface of submerged rocks, usually in deep underground recesses of springs or seeps. The female attends the eggs which hatch in about 3 months. The hatchlings have a larval period of about 3-4 years.

Food Habits:

This species eats primarily other salamanders, large insects and worms.

Other Information

This species was located most often in small spring flows within the Park.

**NORTHERN RED
SALAMANDER**

(Pseudotriton ruber ruber)

Status:

Uncommon.

Distribution and Habitat:

This species inhabits habitats in or near springs or streams in open or wooded areas throughout the Park.

Special Habitat Requirements:

Requirements include areas of clear, cool and not stagnant water. Streams with substrates of sand, gravel or rock are preferred.

Breeding:

Courtship occurs in summer, spawning in October and hatching in December. About 70 eggs are laid in aquatic vegetation. The larval stage lasts about 32 months.

Food Habits:

Earthworms, insects and smaller salamanders are the chief foods.

Other Information

This species is most easily found by looking under moss, stones, logs or within leaf beds in the preferred habitat.

**SOUTHERN TWO-LINED
SALAMANDER**

(Eurycea cirrigera)

Status:

Common.

Distribution and Habitat:

This species lives in or near springs, seepages and streams in hardwood forests and swamps in the Park.

Special Habitat Requirements:

Requirements include rocks or logs in their preferred habitat under which to hide and rocks or logs in running water for egg laying.

Breeding:

Mating occurs in the fall, and eggs are laid in the winter or early spring. The female deposits a flat cluster of eggs on the underside of rocks or logs in running water. The female remains with the eggs until the aquatic larvae hatch. Larval period lasts from 1-3 years.

Food Habits:

Food consists of small terrestrial or aquatic invertebrates and their larvae.

Other Information

This species was commonly located in or near small streams or seeps by turning logs and rocks.

LONG-TAILED SALAMANDER

(Eurycea longicauda)

Status:

Uncommon.

Distribution and Habitat:

This species lives in or near the margins of shaded seeps, springs or streams and sometimes in forested situations.

Special Habitat Requirements:

Requirements include rocks or logs in their preferred habitat under which to hide and shaded waterways for larval stages.

Breeding:

Mating occurs in the fall or early winter. Females lay approximately 90 eggs which are attached to stones, roots or boards in running water or suspended above the water. Hatching occurs in 4-12 weeks. Larval period lasts from 4-7 months.

Food Habits:

Food consists of a wide variety of small terrestrial or aquatic invertebrates and their larvae.

Other Information

This species should be looked for in appropriate habitat throughout the Park.

CAVE SALAMANDER

(Eurycea lucifuga)

Status:

Common.

Distribution and Habitat:

This species occurs on or near rock faces in conjunction with streams or caves. Many times they may be found in debris at the bottom of the rock face or in forested areas nearby.

Special Habitat Requirements:

Requirements include rock faces with varied fissures and cracks and nearby rocks and logs under which to hide and shaded waterways for larval stages.

Breeding:

Oviposition occurs in the fall or early winter. Females lay single eggs which are attached by a stalk to the side of small rimstone pools. Eggs number from 60-120. Larval period lasts from 6-18 months.

Food Habits:

Food consists of a wide variety of small terrestrial or aquatic invertebrates and their larvae.

Other Information

This species should be looked for under rocks and logs and on rock faces.

AMERICAN TOAD

(Bufo americanus)

Status:

Abundant.

Distribution and Habitat:

These toads are habitat generalists, inhabiting nearly all habitats within the Park.

Special Habitat Requirements:

Requirements include shallow water bodies in which to breed and moist areas in which to hide.

Breeding:

Breeds February through April. The female lays approximately 6000 eggs in two long strings on the bottom of shallow pools. Metamorphosis takes about 2 months.

Food Habits:

This species will eat any insect or invertebrate it can fit into its mouth.

Other Information

Often seen foraging in the woods.

FOWLER'S TOAD

(Bufo woodhousii fowleri)

Status:

Common.

Distribution and Habitat:

These toads are habitat generalists, inhabiting nearly all habitats within Park.

Special Habitat Requirements:

Requirements include sandy areas and shallow water bodies in which to breed.

Breeding:

Breeds March through May. The female lays approximately 7000 eggs in two long strings on the bottom of shallow pools. Eggs hatch in about one week. Metamorphosis takes about 1-2 months.

Food Habits:

This species will eat any insect or invertebrate it can fit into its mouth.

Other Information

Forages in more open areas of the Park than *americanus*.

NORTHERN CRICKET FROG

(Acris crepitans)

Status:

Common.

Distribution and Habitat:

Occupies open grassy margins of ponds and streams in the Park.

Special Habitat Requirements:

Requirements include emergent vegetation or vegetation along the shore.

Breeding:

Breeding takes place when weather warms up in spring. Eggs are laid singly or in small groups attached to stems or scattered on the bottom in shallow water. Transformation occurs in late summer.

Food Habits:

Small insects and spiders are the major food sources.

Other Information

Commonly seen or heard in appropriate habitats in warm weather throughout the Park.

COPE'S GRAY TREEFROG

(Hyla chrysoscelis)

Status:

Common.

Distribution and Habitat:

Occupies areas with small trees or shrubs near or standing in shallow bodies of water within the Park.

Special Habitat Requirements:

Requirements include emergent vegetation in unpolluted water bodies.

Breeding:

Breeding takes place from May to August. Scattered groups of 10-40 eggs are laid on the surface of shallow ditches, puddles and ponds. Hatching occurs in 5 days and metamorphosis occurs in about 50 days.

Food Habits:

The diet consists of arboreal insects.

Other Information

This frog is seldom seen outside of the breeding season. It may be heard singing in appropriate habitats within the Park.

SPRING PEEPER

(Hyla crucifer)

Status:

Uncommon.

Distribution and Habitat:

Occupies woodlands near temporary or semi permanent ponds or swamps throughout the Park.

Special Habitat Requirements:

Requirements include second growth or cutover woodlots near unpolluted water body.

Breeding:

Breeding takes place from October through March. About 900 eggs are attached singly to submerged objects in shallow water. Eggs hatch in 5-7 days and metamorphosis occurs in 3-4 months.

Food Habits:

The diet consists of small arthropods.

Other Information

This frog is seldom seen outside of the breeding season. It may sometimes be seen wandering in woody areas after rains. More often heard than seen.

UPLAND CHORUS FROG

(Pseudacris triseriata)

Status:

Common

Distribution and Habitat:

This species inhabits grassy swales, moist woodlands, river bottom swamps and the environs of ponds, bogs and marshes.

Special Habitat Requirements:

Semi-permanent pools are required for breeding.

Breeding:

Breeds December through March. Females lay about 1000 eggs in clusters of 60 each. Eggs are attached to vegetation with metamorphosis in 2-3 months.

Food Habits:

Small arthropods are eaten.

Other Information

This species may be active year around in suitable habitats throughout the Park.

EASTERN NARROWMOUTH TOAD

(Gastrophryne carolinensis)

Status:

Abundant.

Distribution and Habitat:

Occupies areas containing logs, rocks, boards or burrows under which they may hide.

Special Habitat Requirements:

Requirements include areas containing logs, rocks, boards or burrows under which they may hide.

Breeding:

Breeding takes place from May through July. Packets of about 850 eggs are laid on the surface of the water. Eggs hatch in 5-7 days and metamorphosis occurs in 20-70 days.

Food Habits:

The diet consists primarily of ants.

Other Information

This species is very secretive, entirely terrestrial and more often heard than seen.

BULLFROG *(Rana catesbeyiana)*

Status:

Common.

Distribution and Habitat:

This species inhabits larger lakes, ponds, bogs and sluggish stream habitats throughout the Park.

Special Habitat Requirements:

Requirements include vegetation or snags at the water edge in which to hide.

Breeding:

Breeding takes place in late spring and summer. About 12,000 eggs are laid with hatching occurring in 5 days and metamorphosis occurring about a year later.

Food Habits:

The diet consists of insects, crayfish and any small vertebrate which will fit in their mouths.

Other Information

Often seen basking on logs or shores within the Park.

GREEN FROG

(Rana clamitans melanota)

Status:

Abundant.

Distribution and Habitat:

This species inhabits shallow fresh water habitats throughout the Park. Streams and brooks are preferred.

Special Habitat Requirements:

Requirements include shallow and unpolluted water bodies.

Breeding:

Breeding takes place in May and June. The female lays about 3000 eggs in a raft like surface film. Most tadpoles transform within a few months, but, some overwinter.

Food Habits:

The diet consists primarily of arthropods, snails and worms.

Other Information

The banjo-like twang of their call is often heard within the Park. It is readily seen at most water bodies within the Park.

SOUTHERN LEOPARD FROG

(Rana utricularia)

Status:

Abundant.

Distribution and Habitat:

This species inhabits shallow fresh water habitats throughout the Park. Streams and ponds are preferred.

Special Habitat Requirements:

Requirements include shallow and unpolluted water bodies.

Breeding:

Breeding takes place in winter or early spring. The female attaches a firm cluster of several hundred eggs to vegetation just below the water surface. Eggs hatch in 7-14 days. Most tadpoles transform within a few months, but, some overwinter.

Food Habits:

The diet consists primarily of insects.

Other Information

This species is easily found at any pond in the Park.

PICKEREL FROG

(Rana palustris)

Status:

Uncommon.

Distribution and Habitat:

This species inhabits rocky ravines, meadow streams and a wide variety of other habitats near water throughout the Park.

Special Habitat Requirements:

Semi-permanent pools with vegetation are required for breeding.

Breeding:

Breeds April through May. Females lay about 3000 eggs in a round mass attached to aquatic plants. Metamorphosis occurs in 70-80 days.

Food Habits:

Insects and smaller frogs are the main food sources.

Other Information

This species may be readily observed as it ventures well away from water during the summer when vegetation can provide shelter and shade.

COMMON SNAPPING TURTLE

(Chelydra serpentina)

Status:

Uncommon.

Distribution and Habitat:

This species inhabits large or small permanent bodies of fresh water throughout the Park.

Special Habitat Requirements:

This species is a habitat generalist within aquatic habitat types.

Breeding:

Females lay approximately 25 spherical eggs in early spring in a shallow nest, sometimes at considerable distance from water.

Food Habits:

This species is omnivorous. It includes aquatic invertebrates, fish, reptiles, birds, mammals, carrion and aquatic vegetation in its diet.

Other Information

Most often observed in spring as adults wander from one water body to another and young travel from nests to water.

EASTERN BOX TURTLE

(*Terrapene carolina carolina*)

Status:

Uncommon.

Distribution and Habitat:

This species is largely terrestrial and they utilize forested habitats and field edges throughout the Park.

Special Habitat Requirements:

While being largely terrestrial, they do need water close at hand in which to soak.

Breeding:

Females lay 3-8 eggs in June or July. A shallow nest is made in loose soil.

Food Habits:

A wide variety of plants and small animals are eaten.

Other Information

This species is often seen foraging along the roads, especially after rains.

HIEROGLYPHIC RIVER **COOTER**

(*Pseudemys concinna hieroglyphica*)

Status:

Common.

Distribution and Habitat:

This species inhabits a variety of aquatic habitats including rivers, ditches, sloughs, lakes and ponds.

Special Habitat Requirements:

This species requires quiet water with muddy bottom and a profusion of vegetation.

Breeding:

Females lay approximately 10 eggs in May or June. A shallow nest is made in loose soil and the nest may be far from water. Multiple clutches may be laid.

Food Habits:

This species is omnivorous, but juveniles are more carnivorous eating small aquatic insects and snails. Adults eat large amounts of aquatic vegetation.

Other Information

This species is most easily seen in Chickamauga Creek from Alexander's Bridge Site.

EASTERN FENCE LIZARD

(Sceloporus undulatus)

Status:

Abundant.

Distribution and Habitat:

This species inhabits open pine and mixed woods, building sites and fences at lower elevations.

Special Habitat Requirements:

Requirements include open areas with plenty of sunlight.

Breeding:

Females lay from 6-10 eggs in late spring in burrows under rotten logs. Second clutches are sometimes produced in early summer.

Food Habits:

This species eats arthropods such as spiders, crickets, grasshoppers, beetles and snails.

Other Information

Most often observed sunning on rail fences in developed portions of the Park.

FIVE-LINED SKINK

(Plestiodon fasciatus)

Status:

Common.

Distribution and Habitat:

This species inhabits moist, wooded areas throughout the Park.

Special Habitat Requirements:

Requirements include damp areas, dead trees and snags where insects are abundant.

Breeding:

Females lay from 6-12 eggs in June in nests in rotten wood or under rocks.

Food Habits:

This species eats arthropods such as spiders, crickets, grasshoppers and beetles.

Other Information

Most often observed sunning on fences in developed portions of the Park.

GROUND SKINK
(*Scincella lateralis*)

Status:

Common.

Distribution and Habitat:

This species inhabits disturbed areas and open woodlands at lower elevations.

Special Habitat Requirements:

Requirements include areas of leaf litter or detritus in which to forage.

Breeding:

Two or more clutches of from 1-7 eggs are laid in burrows under leaf litter.

Food Habits:

This species eats primarily small insects and spiders.

Other Information

Look for this species in appropriate habitats throughout the Park.

MIDLAND WATERSNAKE
(*Nerodia sipedon pleuralis*)

Status:

Common.

Distribution and Habitat:

This species inhabits swamps, marshes, streams, ponds and lakes throughout the Park.

Special Habitat Requirements:

This species requires quiet water with fish populations.

Breeding:

Eight to fifty young are born live in late summer.

Food Habits:

This species actively seeks fish and amphibians as the chief food items.

Other Information

This species is often observed basking on logs or overhanging limbs at the water's edge.

EASTERN GARTER SNAKE

(Thamnophis sirtalis)

Status:

Uncommon.

Distribution and Habitat:

This species is a habitat generalist and may be found in meadows, marshes, woodlands, hillsides, and along streams and ditches throughout the Park.

Special Habitat Requirements:

This species is most often associated with moist environments and is sensitive to pollution.

Breeding:

Seven to more than one hundred young are born live in late summer.

Food Habits:

Earthworms, fish and amphibians form the bulk of the diet.

Other Information

Most often seen foraging on forest floors during the day.

SMOOTH EARTH SNAKE

(Virginia valeriae)

Status:

Uncommon.

Distribution and Habitat:

This species frequents open forested habitats and forest edges with decaying logs or stumps throughout the Park.

Special Habitat Requirements:

This species needs logs, stones or other surface cover under which to hide.

Breeding:

Two to fourteen young per litter are born in the summer.

Food Habits:

Earthworms are its chief food source.

Other Information

These small snakes are most often located by turning rocks and logs in wooded areas of the Park.

RINGNECK SNAKE

(Diadophis punctatus)

Status:

Uncommon.

Distribution and Habitat:

This species frequents forested habitats with decaying logs or stumps throughout the Park.

Special Habitat Requirements:

While not aquatic, these snakes prefer areas where there is evidence of moisture such as around springs, damp forested hillsides and poorly drained pine woods.

Breeding:

Females lay from 1-10 eggs in sawdust piles, rotten logs or in damp soil under flat stones.

Food Habits:

Earthworms and small salamanders are the principal foods, but frogs, lizards and other small snakes are sometimes eaten.

Other Information

These snakes are almost entirely nocturnal. Individuals may be observed on the Park at night, especially during or following rains.

EASTERN (MIDWEST) WORM SNAKE

(Carphophis amoenus helenae)

Status:

Common.

Distribution and Habitat:

This species frequents moist, forested habitats at low to medium elevations and should be found throughout the Park.

Special Habitat Requirements:

Requires moist earth and will bury deep underground in dry weather.

Breeding:

Females lay from 2-8 eggs in sawdust piles or rotten logs in early summer.

Food Habits:

Earthworms and soft bodied insects are the principal foods of this diminutive species.

Other Information

The best way to find these snakes is to turn over logs or flat rocks in moist woods.

ROUGH GREEN SNAKE

(Opheodrys aestivus)

Status

Uncommon. This species could be more common on the Park than is indicated by this inventory survey.

Distribution and Habitat:

This species frequents moist, forested habitats at low to medium elevations and should be found throughout the Park.

Special Habitat Requirements:

Requires dense vegetation overhanging stream or lake borders.

Breeding:

Females lay from 3-12 eggs under rotten logs or rocks in late spring or early summer. Sometimes known to nest communally.

Food Habits:

Chief food items include spiders, crickets, grasshoppers and insect larvae.

Other Information

Most often seen crossing roads after summer rains.

RAT SNAKE

(Elaphe obsoleta)

Status:

Uncommon.

Distribution and Habitat:

This species inhabits rocky timbered hillsides to flat open fields throughout the Park.

Special Habitat Requirements:

Generally found near wooded areas.

Breeding:

Females lay from 5-25 eggs in or under rotten logs, stumps or sawdust piles in late spring or early summer.

Food Habits:

Small mammals, birds and their eggs, frogs and lizards are eaten.

Other Information

These snakes may be seen foraging during the day.

BLACK KINGSNAKE

(Lampropeltis getula nigra)

Status:

Uncommon.

Distribution and Habitat:

This species may inhabit nearly all available habitats at lower elevations throughout the Park.

Special Habitat Requirements:

Requires surface cover under which to hide.

Breeding:

Females lay from 5-20 eggs in or under rotten logs and similar places.

Food Habits:

Small mammals and other snakes are the principal food sources, although birds and some amphibians are also eaten.

Other Information

These snakes may be seen foraging during the day.

COPPERHEAD

(Agkistrodon contortrix)

Status:

Uncommon.

Distribution and Habitat:

This species inhabits woodlands throughout the Park.

Special Habitat Requirements:

Requires surface cover under which to hide.

Breeding:

Three to fourteen young are born live in late summer after spring mating.

Food Habits:

Insects, amphibians, reptiles, birds and small mammals are eaten.

Other Information

Often seen on the forest floor during the day.

APPENDIX D

CHCH PHOTOGRAPHIC VOUCHER PICTURE LOG

CHCH PHOTOGRAPHIC VOUCHER LOG

ABC PHOTO #	COMMON NAME	SCIENTIFIC NAME	DATE	COORDINATES
1	Smooth Earth Snake	<i>Virginia valeriae</i>	9/13/03	16 S 651051 3875663
2	Southern Two-lined Salamander	<i>Eurycea cirrigera</i>	9/9/04	16 S 660611 3864167
3	Green Frog	<i>Rana clamitans melanota</i>	9/11/04	16 S 657889 3863638
4	Black Kingsnake	<i>Lampropeltis getula nigra</i>	9/14/03	16 S 659697 3865703
5	Northern Slimy Salamander	<i>Plethodon glutinosus</i>	4/2/04	16 S 659545 3865626
6	Eastern Worm Snake	<i>Carphophis amoenus</i>	4/2/04	16 S 660611 3864167
7	Eastern Narrowmouth Toad	<i>Gastrophryne carolinensis</i>	4/2/04	16 S 660469 3864406
8	Northern Red Salamander	<i>Pseudotriton ruber ruber</i>	4/2/04	16 S 660469 3864406
9	Eastern Fence Lizard	<i>Sceloporus undulatus</i>	4/2/04	16 S 660611 3864167
10	Zigzag Salamander	<i>Plethodon dorsalis</i>	4/4/04	16 S 647099 3870855
12	Fowler's Toad	<i>Bufo woodhousii fowleri</i>	6/26/04	16 S 659359 3863628
13	American Toad	<i>Bufo americanus</i>	6/27/04	16 S 650515 3875602
14	Ringneck Snake	<i>Diadophis punctatus</i>	6/27/04	16 S 649553 3874100
15	Five-lined Skink	<i>Plestiodon fasciatus</i>	6/26/04	16 S 657803 3863571
16	Cope's Gray Treefrog	<i>Hyla chrysoscelis</i>	6/27/04	16 S 650876 3875935
17	Spotted Dusky Salamander	<i>Desmognathus conanti</i>	9/12/04	16 S 650219 3874849
18	Spring Salamander	<i>Gyrinophilus porphyriticus</i>	9/12/04	16 S 659697 3865703
21	Midland Watersnake	<i>Nerodia sipedon pleuralis</i>	9/11/04	16 S 658799 3864327
23	Eastern Garter Snake	<i>Thamnophis sirtalis</i>	9/10/04	16 S 648056 3872505
24	Pickerel Frog	<i>Rana palustris</i>	9/9/04	16 S 657911 3863623
25	Northern Cricket Frog	<i>Acris crepitans</i>	9/1/05	16 S 659305 3867971
26	Bullfrog	<i>Rana catesbeiana</i>	9/11/04	16 S 658799 3864327
27	Longtail Salamander	<i>Eurycea longicauda</i>	9/12/04	16 S 659697 3865703
28	Cave Salamander	<i>Eurycea lucifuga</i>	9/12/04	16 S 657911 3863623
29	Southern Leopard Frog	<i>Rana utricularia</i>	9/14/03	16 S 647099 3870855
30	Ground Skink	<i>Scincella lateralis</i>	9/9/04	16 S 660469 3864406
11	Copperhead	<i>Agkistrodon contortrix</i>	6/26/04	16 S 660619 3864154
19	Rough Green Snake	<i>Opheodrys aestivus</i>	9/12/04	16 S 659697 3865703