

Occurrence and Relative Abundance of Amphibians and Reptiles at
Tallgrass Prairie National Preserve, Homestead National Monument of
America, and Pipestone National Monument within the Heartland Inventory
and Monitoring Network



Bull Snake (*Pituophis catenifer sayi*) from Tallgrass Prairie National Preserve.

Interim Report based on survey results as of:
1 October 2002

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BACKGROUND

Amphibian and reptile surveys are presently being conducted at three national areas that are under the jurisdiction of the National Park Service: Tallgrass Prairie National Preserve (TAPR) in Strong City, Kansas, Homestead National Monument of America (HOME) in Beatrice, Nebraska, and Pipestone National Monument (PIPE) in Pipestone, Minnesota. The facilitation of herpetofaunal inventories at these parks is the responsibility of the National Park Service's (NPS) Heartland Inventory and Monitoring Network (HIMN), and the surveys are being administered through the Great Plains Cooperative Ecosystem Studies Unit (CESU) headquartered at the University of Nebraska at Lincoln (UNL).

In late winter 2002 an agreement was reached between HIMN and the University of Nebraska at Omaha (UNO) to perform these surveys beginning in April 2002. However, due to complications involving UNO's status as a CESU institution, a contract to perform herpetofaunal survey work at these parks was not received by the field investigator until 27 June 2002. To ensure that the entire spring field season was not lost, some surveys were conducted during April and May 2002. The following progress report reflects the inventory results obtained from 19 April through 1 October 2002.

SEARCH EFFORT

Within the time period described above, the parks were visited a total of 13 times during the months of April, May, June, and September 2002. The visits are broken down as follows:

TAPR:	5 visits (19 April, 19 May, 25 May, 16 June, and 17 June)
HOME:	5 visits (2 May, 15 May, 7 June, 20 June, 12 September)
PIPE:	3 visits (20 May, 21 June, 21 September)

The 13 visits to the parks resulted in 99 search hours that are broken down by park as follows:

TAPR:	58 hours
HOME:	20 hours
PIPE:	21 hours

Four survey techniques were primarily used. The most commonly employed technique was a visual encounter survey, which was performed by walking through various habitats on park grounds and recording visual encounters with amphibians and/or reptiles. To maximize efforts using this survey technique, natural cover objects such as rocks and logs were overturned in order to uncover specimens that may be taking cover.

In areas where natural cover is scarce, artificial cover was used to attract amphibians and reptiles. Cover boards were cut from 0.8 cm (5/16 in) thick plywood and were approximately 61 cm x 61 cm (24 in x 24 in) in dimension. This technique was used only at HOME and PIPE. A total of 22 boards were placed at HOME, and 17 at PIPE. NPS employees and summer interns occasionally checked cover boards at PIPE.

Amphibian call surveys were used at all three parks during May and June. Call surveys were conducted twice during each visit: once during the day and once again after sunset. Since TAPR is so large and has so many aquatic features, daytime surveys were conducted at livestock ponds while nighttime surveys concentrated on amphibian calls heard from Fox Creek and its immediate riparian habitat. Call surveys at HOME were conducted primarily on Cub Creek, although a few small vernal pools were also surveyed early in spring. Numerous temporary pools appear at PIPE as well as Pipestone Creek and a small lake along the creek. All of the pools as well as the stream and lake

were surveyed for calling amphibians. Additionally, a hand-held net was used to sample vernal pools for amphibian larvae at PIPE.

Finally, at all sites, road surveys were conducted for reptiles and amphibians that may either be migrating to or from NPS property or that may occur on adjacent properties. This survey technique was constrained by the restricted network of roads that border each park.

RESULTS

Since the start of the survey, more than 650 specimens representing 32 different species have been identified from the three parks. TAPR represents the most diverse park with 26 species uncovered. Twelve species have been identified at HOME, and eight at PIPE.

According to a preliminary list provided to the field investigator by NPS, the number of amphibian species expected to occur at TAPR is 11, and the number of expected reptile species is 36. As of 1 October 2002, seven species of amphibians, or approximately 64% of the expected species, and 19 species of reptiles, or 53%, have been identified. The combined ratio of identified/expected reptiles and amphibians at TAPR is 55.3%. The number of amphibian species expected to occur at HOME is 10. The number of species positively identified is six, resulting in a ratio of 60%. Out of 20 reptile species expected to occur, only six, or 30%, have been identified, and the total ratio is 40%. Four out of eight expected species of amphibians have been uncovered at PIPE, as well as four out of nine reptile species. Ratios for these results are 50% and 44% respectively, with a total ratio of 47%. Lists of species identified at each park can be found in the Appendix.

These ratios are based on the list provided by NPS, however the species that are expected to occur are based on large area distribution maps, specifically Conant and Collins' Field Guide to the Reptiles and Amphibians of Eastern and Central North America. Some of these species are not known from the regions where the parks are located, thus the ratios are lower than they should be. Smaller scale maps and distribution information are available for each state in which the parks occur, and a "revised" list of expected species, with references, will be presented in the final report.

FUTURE PLANS

Since the 2002 spring season search effort was reduced due to administrative complications, surveys will begin again in March 2003, as weather allows, using the same techniques described above. In addition to these techniques, the use of drift fences and funnel traps to capture terrestrial species¹ and the use of aquatic turtle traps² will be employed to attempt to identify species that are expected but have not yet been encountered. Drift fences will be installed at all three parks and will be erected during early spring (mid- to late March). Aquatic turtle traps will be used only at TAPR and HOME, and only in the streams. No traps will be set in temporary pools or permanent stock ponds. Turtle traps will be set during May 2003.

The majority of the spring 2003 effort will be directed towards encountering those species that are expected but have not yet been identified. An analysis of 2002 results will be done and specific techniques to attempt to uncover the elusive species will be devised. In addition, a comparison of encounter rates with the spring 2002 results will be conducted in order to determine whether expected results can be predicted if similar search efforts and techniques are used during each year.

1. The use of drift fences has been discussed with resource managers at all three parks and all have agreed that this technique can be used with minimal impact to park grounds.

2. Although the federally endangered Topeka Shiner (*Notropis topeka*) is known to occur in Fox Creek, the mesh of the turtle traps is too large to hold fish of this small size and thus should not be a threat.

APPENDIX

The following is a list of expected and identified species for each park.

TALLGRASS PRAIRIE NATIONAL PRESERVE

Common Name	Scientific Name	Identified
Eastern Tiger Salamander	<i>Ambystoma tigrinum</i>	
Great Plains Toad	<i>Bufo cognatus</i>	
Woodhouse's Toad	<i>Bufo woodhousei</i>	x
Great Plains Narrowmouth Toad	<i>Gastrophryne olivacea</i>	x
Plains Spadefoot Toad	<i>Spea bombifrons</i>	
Plains Leopard Frog	<i>Rana blairi</i>	x
Northern Cricket Frog	<i>Acris crepitans</i>	x
American Toad	<i>Bufo americanus</i>	
Cope's Gray Treefrog	<i>Hyla chrysoscelis</i>	x
Western Chorus Frog	<i>Pseudacris triseriata</i>	x
Bullfrog	<i>Rana catesbeiana</i>	x
Ornate Box Turtle	<i>Terrapene ornata</i>	x
Smooth Softshell Turtle	<i>Apalone muticus</i>	
Slender Glass Lizard	<i>Ophisaurus attenuatus</i>	
Eastern Collared Lizard	<i>Crotaphytus collaris</i>	x
Texas Horned Lizard	<i>Phrynosoma cornutum</i>	x
Great Plains Skink	<i>Eumeces obsloetus</i>	x
Northern Prairie Skink	<i>Eumeces septentrionalis</i>	
Ground Skink	<i>Eumeces lateralis</i>	
Six-lined Racerunner	<i>Cnemidophorus sexlineatus</i>	
Western Worm Snake	<i>Carphophis amoenus</i>	
Great Plains Rat Snake	<i>Elaphe emoryi</i>	x
Eastern Hognose Snake	<i>Heterodon platirhinos</i>	
Prairie Kingsnake	<i>Lampropeltis calligaster</i>	
Common Kingsnake	<i>Lampropeltis getula</i>	x
Plainbelly Water Snake	<i>Nerodia erythrogaster</i>	
Diamondback Water Snake	<i>Nerodia rhombifera</i>	
Bull Snake	<i>Pituophis catenifer</i>	x
Graham's Crayfish Snake	<i>Regina grahami</i>	
Flathead Snake	<i>Tantilla gracilis</i>	x
Western Ribbon Snake	<i>Thamnophis proximus</i>	x
Plains Garter Snake	<i>Thamnophis radix</i>	
Lined Snake	<i>Tropidoclonion lineatum</i>	x
Osage Copperhead	<i>Agkistrodon contortrix</i>	
Five-lined Skink	<i>Eumeces fasciatus</i>	
Massasauga	<i>Sistrurus catenatus</i>	x
Common Snapping Turtle	<i>Chelydra serpentina</i>	x
Painted Turtle	<i>Chrysemys picta</i>	x

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Three-toed Box Turtle	<i>Terrapene carolina</i>	
Spiny Softshell Turtle	<i>Apalone spinifera</i>	
Racer	<i>Coluber constrictor</i>	x
Ringneck Snake	<i>Diadophis punctatus</i>	x
Black Rat Snake	<i>Elaphe obsoleta</i>	x
Milk Snake	<i>Lampropeltis triangulum</i>	x
Northern Water Snake	<i>Nerodia sipedon</i>	x
Brown Snake	<i>Storeria dekayi</i>	
Common Garter Snake	<i>Thamnophis sirtalis</i>	

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HOMESTEAD NATIONAL MONUMENT OF AMERICA

Common Name	Scientific Name	Identified
Eastern Tiger Salamander	<i>Ambystoma tigrinum</i>	
Great Plains Toad	<i>Bufo cognatus</i>	
Green Toad	<i>Bufo debilis</i>	
Woodhouse's Toad	<i>Bufo woodhousei</i>	x
Great Plains Narrowmouth Toad	<i>Gastrophryne olivacea</i>	
Plains Leopard Frog	<i>Rana blairi</i>	x
Northern Cricket Frog	<i>Acris crepitans</i>	x
Cope's Gray Treefrog	<i>Hyla chrysoscelis</i>	x
Western Chorus Frog	<i>Pseudacris triseriata</i>	x
Bullfrog	<i>Rana catesbeiana</i>	x
Ornate Box Turtle	<i>Terrapene ornata</i>	
Smooth Softshell Turtle	<i>Apalone muticus</i>	
Slender Glass Lizard	<i>Ophisaurus attenuatus</i>	
Northern Prairie Skink	<i>Eumeces septentrionalis</i>	
Six-lined Racerunner	<i>Cnemidophorus sexlineatus</i>	
Prairie Kingsnake	<i>Lampropeltis calligaster</i>	
Common Kingsnake	<i>Lampropeltis getula</i>	
Bull Snake	<i>Pituophis catenifer</i>	x
Plains Garter Snake	<i>Thamnophis radix</i>	x
Lined Snake	<i>Tropidoclonion lineatum</i>	
Massasauga	<i>Sistrurus catenatus</i>	
Common Snapping Turtle	<i>Chelydra serpentina</i>	x
Painted Turtle	<i>Chrysemys picta</i>	x
Spiny Softshell Turtle	<i>Apalone spinifera</i>	
Racer	<i>Coluber constrictor</i>	x
Ringneck Snake	<i>Diadophis punctatus</i>	
Black Rat Snake	<i>Elaphe obsoleta</i>	
Milk Snake	<i>Lampropeltis triangulum</i>	
Brown Snake	<i>Storeria dekayi</i>	
Common Garter Snake	<i>Thamnophis sirtalis</i>	x

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PIPESTONE NATIONAL MONUMENT

Common Name	Scientific Name	Identified
Eastern Tiger Salamander	<i>Ambystoma tigrinum</i>	x
Great Plains Toad	<i>Bufo cognatus</i>	
Green Toad	<i>Bufo debilis</i>	
Woodhouse's Toad	<i>Bufo woodhousei</i>	
Northern Cricket Frog	<i>Acris crepitans</i>	
American Toad	<i>Bufo americanus</i>	x
Cope's Gray Treefrog	<i>Hyla chrysoscelis</i>	
Western Chorus Frog	<i>Pseudacris triseriata</i>	x
Bullfrog	<i>Rana catesbeiana</i>	
Northern Leopard Frog	<i>Rana pipiens</i>	x
Northern Prairie Skink	<i>Eumeces septentrionalis</i>	x
Bull Snake	<i>Pituophis catenifer</i>	
Plains Garter Snake	<i>Thamnophis radix</i>	x
Lined Snake	<i>Tropidoclonion lineatum</i>	
Common Snapping Turtle	<i>Chelydra serpentina</i>	x
Painted Turtle	<i>Chrysemys picta</i>	x
Blanding's Turtle	<i>Emydoidea blandingii</i>	
Redbelly Snake	<i>Storeria occipitomaculata</i>	
Common Garter Snake	<i>Thamnophis sirtalis</i>	

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