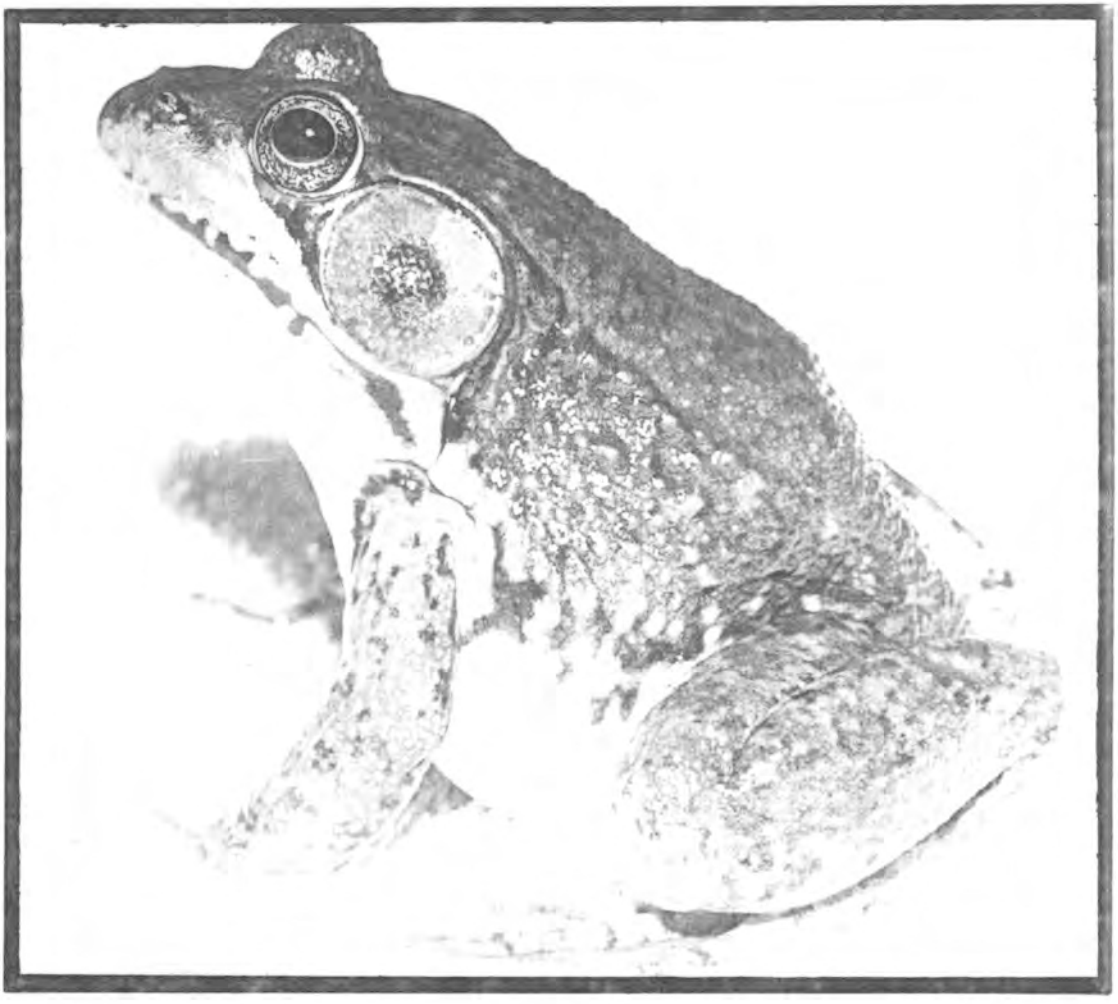
INVESTIGATION OF THE GREEN FROG

Rana clamitans melanota

IN SOUTHEASTERN KANSAS



REPORT TO THE KANSAS FISH AND GAME COMMISSION (non-game wildlife contract #2A) JULY 1985

By: Larry Miller
524 North Osage Street
Caldwell, Kansas 67022

INVESTIGATION OF THE GREEN FROG IN SOUTHEASTERN KANSAS

BY

LARRY MILLER

INTRODUCTION

This project was designed to find out more about the range, habits, and population of the green frog in Kansas. The frog had been collected from two Kansas counties in the past.

Smith (1932) first reported the green frog in Kansas. He made this report in Volume 35, 1932 TRANSACTIONS KANSAS ACADEMY OF SCIENCE on page 95 in an article titled "A REPORT UPON AMPHIBIANS HITHERTO UNKNOWN FROM KANSAS". Part of that report is as follows:

> "...In the region in question there was a large number of abandoned mining pits, vertically-sided, and some very deep. Several were rather shallow, having caved in or been otherwise partly filled, and rain water had collected there to form permanent pools. It was only in such pools that R. clamitans was found.
>
> A number of larvae* were collected in 1931, and 3 adults* were secured sitting on the sides of pools at night in 1932. Although not rare, they were so wary and difficult to collect that only by extreme perseverence were these specimens obtained. During the day none were seen, all probably having hidden themselves among the leaves and other debris of the pools.
>
> One specimen* from Miami County in the Kansas University Museum adds another record to the distribution of this frog in Kansas. Its western range limit was previously Missouri, over all of which, according to Hurter (5), it is found in abundance..."

The following information about the specimens marked (*) above should be noted as follows: (1) The larvae collected in 1931 were apparently not saved. There is no record. (2) The three adults collected show 1933, not 1932 as the collection date in the KU catalog. They show KU numbers of 17473, 17474, and 17475. Also, these specimens were lost as of 1972. (3) The specimen from Miami County was collected in 1911 by an unknown collector. It shows a KU number of 9281 and it was also lost as of 1972.

This project also called for photos of habitat, photos of the frogs (if found), collecting specimens, and recording information about other amphibians and reptiles encountered during the study. The work was to be done between 1 March 1985 and 30 June 1985.

(Please note that detailed collection data on Kansas Rana clamitans melanota is given at the reports end)

METHODS

A total of 13 days were spent in the Cherokee County area of southeastern Kansas between 5 April 1985 and 23 June 1985 in search of the green frog. The trips to the area were made on the following dates (miles driven per trip are given in parentheses): 5 April (442 miles); 3-5 May (553 miles); 2-5 June (849 miles); 12-13 June (480 miles); and 21-23 June (900 miles). The total miles driven during the project was 3224. A total of six voucher specimens of the green frog were collected. They represented three different locations in Cherokee County. All six specimens were sent to the Museum of Natural History at the University of Kansas in Lawrence, Kansas.

A number of other amphibians and reptiles were collected or observed from the area during the project. Some were of special interest, and specimens were sent to the KU Museum. More information about these animals is given later in this report.

Field notes were kept for the trips, as well as maps for the work done in the southeastern corner of Cherokee County. A summary of the notes, as well as copies of the maps has been included in this report along with a list of each species of amphibian and reptile either collected or observed during the study.

During the study attempts were made to locate known sites where the green frog had been known to occur and search for new localities. Attempts were made to locate frogs by searching for adult frogs and listening for calling frogs at night. Each night search was made by driving the roads of the study areas and listening for calling frogs at every possible site. No frogs were ever located during the daylight hours, but finding adult frogs by call proved successful.

Photographs were taken of the living frogs and the habitat in which they were found. Copies of the photographs have been included in this report.

HABITS AND RANGE OF THE GREEN FROG

The green frog has only been found in two counties along the eastern border in Kansas. Collins (1982) stated that the frog is restricted to the extreme eastern border of Kansas in the Osage Cuesta region. He also stated that the record from Miami County may have been the result of accidental introduction. This would leave the Cherokee records the only records for Kansas.

Collins (1982) stated that the green frog generally prefers brooks and streams, but can also be found at the edges of lakes, ponds, ditches, strip pits, and back-water sloughs of rivers. He also stated that nothing was known of the animals annual activity in Kansas as of 1982.

Conant (1975) states that the green frog is an abundant frog throughout a large part of its range and that it could be found in shallow fresh water - in springs, rills, creeks, and ditches, and along edges of lakes and ponds. He also stated that in many areas it is a frog of brooks and small streams.

Conant (1975) gives the range of the green frog as follows: Maritime Provinces to N. Carolina; west to Minnesota and east Oklahoma, but absent from a large part of Illinois; introduced in Newfoundland, British Columbia, Washington, and Utah.

The green frog grows from between 5.7 to 8.9 cm. in average size. It is highly variable in color. Its call can be compaired to a loose banjo string. Conant (1975) states that the animal breeds from April to August.

RESULTS OF STUDY

During my work in the southeastern corner of Kansas I was able to confirm the presence of the green frog (Rana clamitans melanota) in three areas. Good habitat was also located in several other areas in the extreme southeastern corner of Cherokee County and it is quite possible that the frogs may also be found in some of those areas. The counties bordering Cherokee County in Kansas were also investigated, however no frogs or good habitat were found in these areas.

The following summary deals with the three areas where the frogs were observed, heard calling, and collected. They include locations B,C,&D as shown on map #2 at the end of this report.

Location "B" is just across the Spring River east of Riverton on highway 66. It is on the north side of the highway and covers a rather large area (see photos 1,2,&3). The water is still and ranges from only a few centimeters in depth to over a meter. There are many trees and lots of other vegetation in the area.

Green frogs were first heard calling in this area at about 10:00 pm the evening of 2 June 1985. The air temperature was 80°F. and the water temperature was about 75°F. It was a calm and cloudy evening with very high humidity. About five to seven frogs were heard calling.

One male frog was collected as he called from the bank under a small bush. The depth of the water near the bank was about 80 cm. A number of bullfrogs were also calling from the same area. No other species of frogs or toads were heard calling. The specimen of the green frog was collected at 11:10 pm.

The evening of 3 June 1985 green frogs were once again heard calling from the same area. They were first heard at about 10:15 pm. The air temperature was 68°F. and the water temperature was about 75°F. It was a calm evening with high humidity. A total of two green frogs were collected at about 10:30 pm. One bullfrog was also collected. All of the frogs were found on the banks at the waters edge. There were 12+ green frogs calling the evening of 3 June.

The area was visited again the evening of 12 June 1985. The air temperature that evening at about 10:00 pm. was about 60°F. and falling. No frogs were heard calling that evening between 10:00 pm. and 1:00 am. on 13 June 1985. The air temperature fell to about 45°F. by sunrise the morning of the 13th.

The area was last visited the evening of 22 June 1985. The air temperature that evening was about 85°F. at 11:00 pm. There had been heavy rains and the water level was up several centimeters. There was a current and it was evident that the water was flowing somewhat. No green frogs were heard calling and none were observed at that time.

Location "C" is just south of Shoal Creek on the east side of highway 26 south of Galena. It is a small pond (see photo 4) with many trees around it and lots of other plant growth. The depth of the water is over one meter in some areas.

Green frogs were first heard calling at this location at about 12:40 am the morning of 3 June 1985. The air temperature was about 79°F. with high humidity. Two green frogs were heard calling along with several bullfrogs and cricket frogs. No frogs were collected.

Four frogs were heard calling at about 9:30 pm. the evening of 3 June 1985 at an air temperature of about 68°F. One frog was collected from the waters edge at that time. One large bullfrog was observed calling from the bank about one meter from the green frog that was also collected as he called.

One other green frog was collected from the pond the evening of 22 June 1985. The air temperature was about 85°F. The water level was much higher because of heavy rains and only one other green frog was heard calling at the pond that evening.

Location "D" is just southeast of the Spring River and only about ¼ mile west of the Missouri border. It is also about 9½ miles north of the Oklahoma border. It is a small pond with few trees close to the pond. The water depth is about 90cm. to one meter deep at the deepest point. There is a lot of vegetation in the water and around the pond.

One green frog was thought to have been heard at this location the evening of 2 June 1985. There were a number of eastern narrowmouth toads and treefrogs calling from the pond. Several water snakes were also observed. The air temperature was about 80°F. No green frogs were collected.

The pond was visited again the evening of 12 June 1985 at about 9:30 pm. The air temperature was about 64°F. No frogs of any species were heard calling at that time.

The pond was next visited the evening of 22 June 1985. The air temperature was about 85°F. Treefrogs, eastern narrowmouth toads, and one green frog were heard calling. The green frog was located calling from the middle of the pond and collected.

The pond was visited at about noon on the 23rd of June for the last time. No green frogs were found, but a number of eastern narrowmouth toads were calling. It was a sunny and hot day. The temperature was 90°+ and the humidity was high.

All of the frogs heard calling during my field work were heard after sunset. Also, the animals seem to prefer rather warm water and air temperatures for breeding in Kansas. The frogs heard calling during my work were heard evenings when the air temperatures were between about 68°F. and 85°F. The nights were also calm with rather high humidity. No frogs where heard on nights when the temperature was below 65°F.

All but one of the green frogs collected or observed were calling from the bank. They were generally located at the waters edge. Only the one frog was found calling from the middle of a small pond. There were often bullfrogs calling from the same areas as the green frogs.

All of the frogs were found near streams or rivers, but none were found calling from the banks of such running water. They seem to prefer rather shallow permanent water supplies and avoid running water. Few, if any, fish where found in the ponds where the green frogs were found calling. All of the locations had trees either growing in the water or very near the water. Much vegetation was found in and around the water at every location.

RANGE OF THE GREEN FROG IN KANSAS

Based on past data, and the results of my field work it appears that the green frog (Rana clamitans melanota) has a very limited range in Kansas. All but one of the old records show the green frog to occur only in an area of about 60 square miles located in the very southeastern corner of Cherokee County in the very southeastern corner of the state (see map #1). My work found the green frog to occur in an area of about 50 square miles in the same part of the state. Also, the animal seems to be limited to only a few breeding locations within the area.

It is very likely the green frog only occurs in the extreme southeastern corner of the state. All of the frogs found during my study were found south and east of the Spring River in Cherokee County. All records for Cherokee County have been from areas close to this river or Shoal Creek.

Collins (1982) states that the green frog is restricted to the extreme eastern border of Kansas in the Osage Cuesta reigon, and Johnson (1977) shows the frog to be found in the southwestern counties of Missouri which border southeastern Kansas. Thus the range of the green frog in Kansas is very limited.

SUMMARY

The range of the green frog (Rana clamitans melanota) is very limited in Kansas. It is also quite likely that the range has diminished somewhat during past years due to human activities such as agriculture and mining. It should be noted that the area 3-5 miles north of Baxter Springs described by Smith (1932) was not found during my work. There are a number of homes in the area and the habitat has been greatly altered by agriculture and other human activities.

Populations of green frogs were very small at each site studied. The location east of the Spring River at Riverton was the only area where several males were heard calling. Breeding populations of this frog in Kansas could be greatly reduced or even eliminated with future habitat alterations and/or pollution problems that might be caused by mining, agriculture, industry, or other human projects.

RECOMMENDATIONS

The green frog has such a limited range in Kansas and total population seems to be low, thus I would recommend that this frog be seriously considered for endangered species status in Kansas. Areas where this frog is found should be considered for possible protection and sanctuaries established if at all possible.

(The information below was provided by J.T. Collins. It gives data on the known green frogs from Kansas before my study was conducted between 5 April and 23 June 1985.)

Kansas Rana clamitans melanota

KU 9281 Miami Co: Marais des Cygnes River near Osawatomie. July 1911. Collector unknown (specimen lost as of 1972).

KU 16205 Cherokee Co: near Riverton. 26 March 1932. Collector: E. H. Taylor et al. (specimen missing)

KU 17473-475 Cherokee Co: 4 mi N Baxter Springs. 25 March 1933. Collectors: E. H. Taylor & H. M. Smith (specimens lost as of 1972).

KU 20388-394 Cherokee Co: 3-5 mi N Baxter Springs, near Spring River. April 1932. Collectors: E. H. Taylor & H. M. Smith (specimens lost as of 1972).

KU 23166-167 Cherokee Co: creek in SE corner (of state), E of Baxter Springs. 20 October 1945. Collector: C. W. Hibbard et al. (specimens lost as of 1972).

KU 154015 Cherokee Co: Schermerhorn Park, Shoal Creek backwater. 3 March 1973. Collector: R. E. Ashton.

FHSU 2425-26 Cherokee Co.: 1 mi S Galena. 10 April 1965. Collector unknown.

JTC Photo in 1982 Ks Herp Book: Cherokee Co: Schermerhorn Park, Shoal Creek backwater. 18 March 1972. Collectors: J. T. Collins & R. E. Ashton (specimen released)

J. T. Collins
June 1985

ANIMALS COLLECTED DURING THE STUDY

A total of 10 species of amphibians and 22 species of reptiles were encountered in Cherokee County during my work on this project. Several were of special interest, and some were collected and sent to the Museum of Natural History at the University of Kansas. A list of animals sent to KU along with collection data is given below.

(ALL ANIMALS LISTED BELOW ARE FROM CHEROKEE COUNTY, KS.)

KU NUMBER(S)	SCIENTIFIC NAME	LOCATION	DATE
KU 203605-609	Gastrophryne carolinensis	Sec. 36, T33S, R25E.	2 June 1985
*KU 203610-611	Rana clamitans	Sec. 17, T34S, R25E.	2-3 June 1985
KU 203612	Rana clamitans	Sec. 35, T34S, R25E.	3 June 1985
KU 203617	Sternotherus odoratus	Sec. 17, T34S, R25E.	2 June 1985
KU 203619	Chrysemys floridana	Sec. 17, T34S, R25E.	2 June 1985
KU 203628-630	Gastrophryne carolinensis	Sec. 7, T35S, R25E	22 June 1985
KU 203631-632	Gastrophyne carolinensis	Sec. 36, T33S, R25E	22 June 1985
KU 203633	Rana clamitans	Sec. 36, T33S, R25E	22 June 1985
KU 203634	Rana clamitans	Sec. 35, T34S, R25E	22 June 1985
KU 203635 (DOR)	Lampropeltis calligaster	Sec. 14, T33S, R25E	22 June 1985

*Another specimen of the green frog from this location is being kept alive at the Museum of Natural History at the time of this writing. (11 July 1985)

A total of 10 eastern narrowmouth toads (Gastrophyne carolinensis) were collected from Locations A,D,&E (see map #2) during the project. Many of these rare toads were heard calling from most of the same areas as green frogs were found. They also seemed to prefer warm temperatures to call. At times this species was heard calling during daylight hours. They were very hard to find when calling and often called from clumps of vegetation along the waters edge or from vegetation in the water at the surface. One was observed under a board at the waters edge at Location "D".

Water snakes of the genus Nerodia were often observed at the breeding sites of the eastern narrowmouth toad as well as a number of western ribbon snakes (Thamnophis proximus). It is quite possible that the snakes were feeding on the small toads as well as other amphibians.

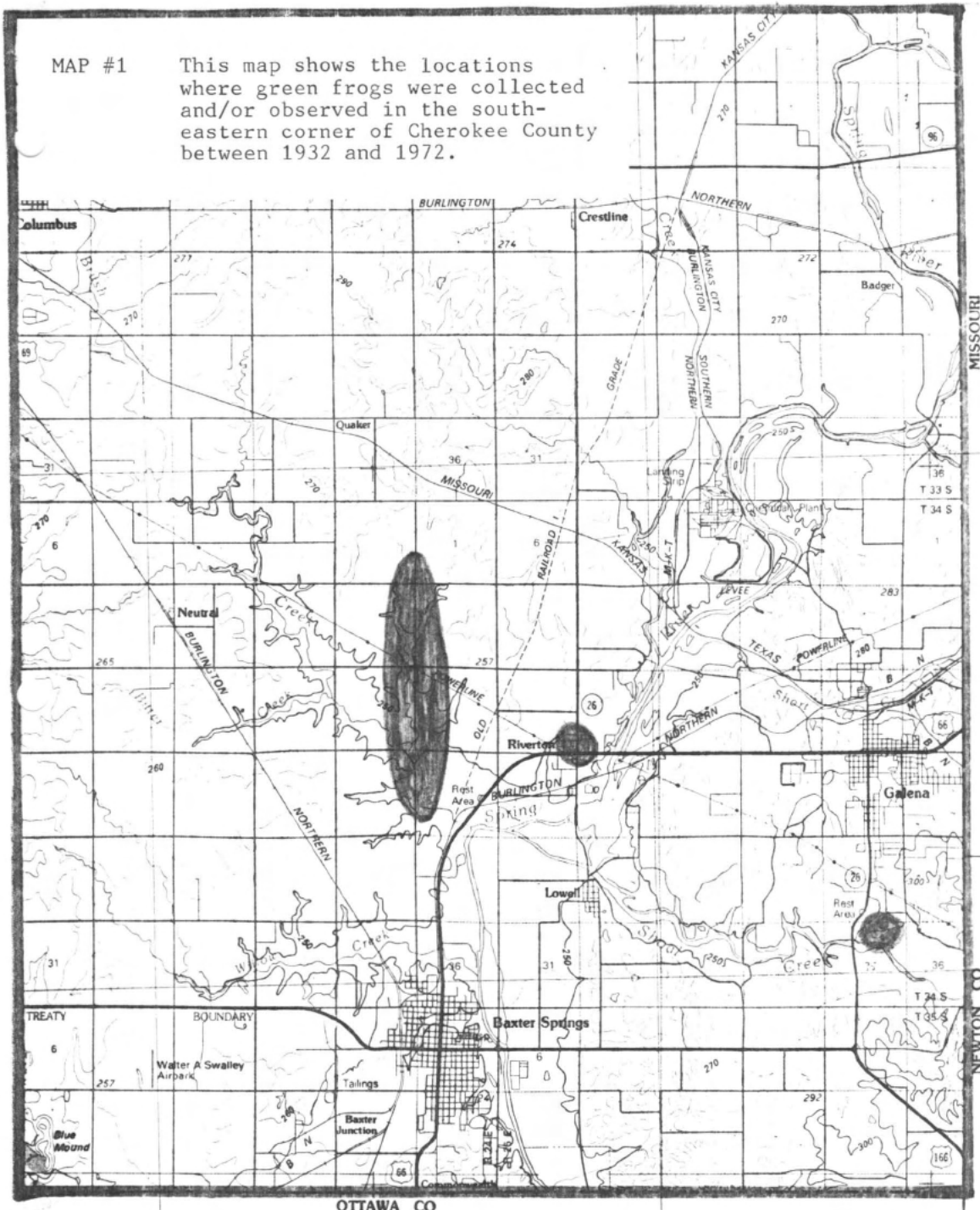
AMPHIBIANS & REPTILES COLLECTED AND/OR OBSERVED IN CHEROKEE COUNTY, KS.

(5 April - 23 June 1985)

CENTRAL NEWT (Notophthalmus viridescens louisianensis)
DARK-SIDED SALAMANDER (Eurycea longicauda melanopleura)
CAVE SALAMANDER (Eurycea lucifuga)
BLANCHARD'S CRICKET FROG (Acris crepitans blanchardi)
WESTERN CHORUS FROG (Pseudacris t. triseriata)
GRAY TREEFROG (Hyla chrysoscelis)
BULLFROG (Rana catesbeiana)
GREEN FROG (Rana clamitans melanota)
SOUTHERN LEOPARD FROG (Rana u. utricularia)
EASTERN NARROWMOUTH TOAD (Gastrophryne carolinensis)

COMMON SNAPPING TURTLE (Chelydra s. serpentina)
STINKPOT (Sternotherus odoratus)
THREE-TOED BOX TURTLE (Terrapene carolina triunguis)
ORNATE BOX TURTLE (Terrapene o. ornata)
MISSOURI COOTER (Chrysemys floridana hoyi)
RED-EARED SLIDER (Chrysemys scripta elegans)
WESTERN SPINY SOFTSHELL (Trionyx spiniferus hertwegi)
EASTERN FENCE LIZARD (Sceloporus undulatus)
TEXAS HORNED LIZARD (Phrynosoma cornutum)
GROUND SKINK (Scincella lateralis)
FIVE LINED SKINK (Eumeces laticeps)
PRAIRIE-LINED RACERUNNER (Cnemidophorus sexlineatus)
EASTERN HOGNOSE SNAKE (Heterodon platyrhinos)
PRAIRIE RINGNECK SNAKE (Diadophis punctatus arnyi)
ROUGH GREEN SNAKE (Opheodrys aestivus)
BLACK RAT SNAKE (Elaphe o. obsoleta)
PRAIRIE KINGSNAKE (Lampropeltis c. calligaster)
WESTERN RIBBON SNAKE (Thamnophis proximus)
BLOTCHED WATER SNAKE (Nerodia erythrogaster transversa)
DIAMONDBACK WATER SNAKE (Nerodia r. rhombifera)
NORTHERN WATER SNAKE (Nerodia s. sipedon)
COPPERHEAD (Agkistrodon contortrix)

MAP #1 This map shows the locations where green frogs were collected and/or observed in the south-eastern corner of Cherokee County between 1932 and 1972.



(PAGE #10)

94

CHEROKEE CO., KANS.

N3659–W9436

1981

1000 0 5000 METERS

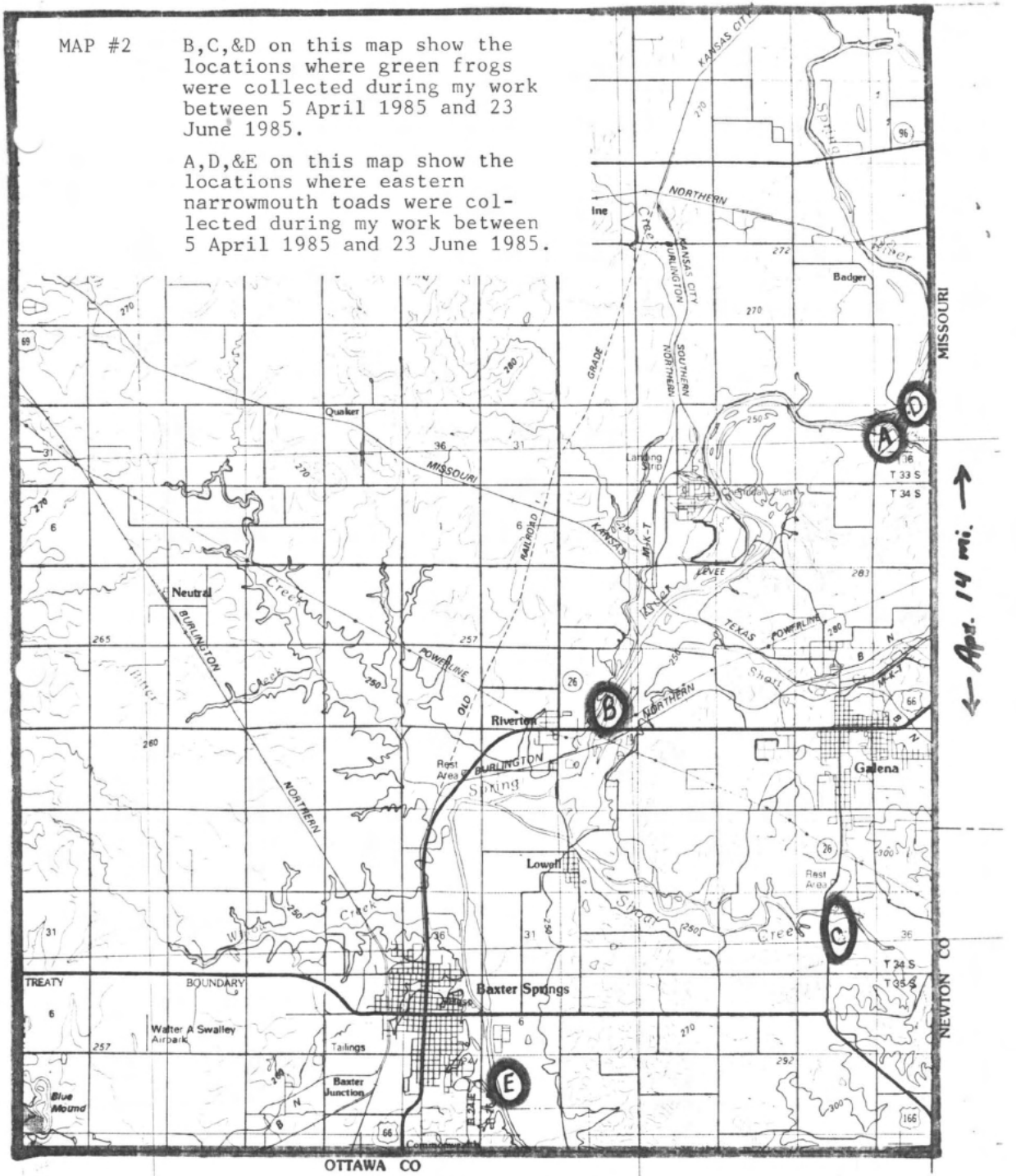
R ON THE GROUND

ERS 5000 0 10 000 20 000 FEET

MAP #2

B,C,&D on this map show the locations where green frogs were collected during my work between 5 April 1985 and 23 June 1985.

A,D,&E on this map show the locations where eastern narrowmouth toads were collected during my work between 5 April 1985 and 23 June 1985.



(PAGE #11)

3 075 45' 3 100 3 125 37'30"

94

CHEROKEE CO., KANS.

N3659–W943(

1981

1000 0 5000 METERS

R ON THE GROUND

ERS 5000 0 10 000 20 000 FEET

PHOTO #1 This photo shows Location "B" and was taken 3 June 1985.

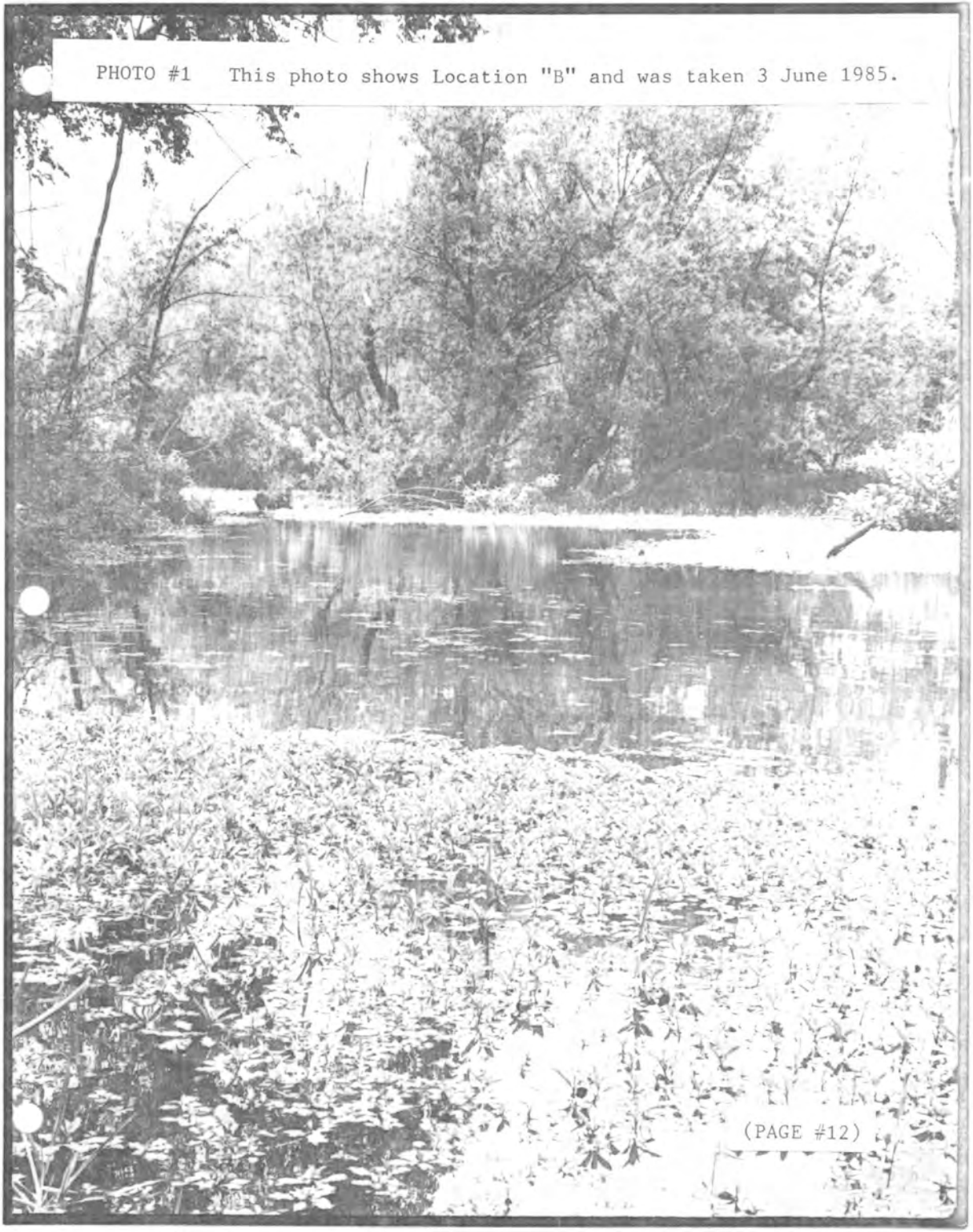


PHOTO #2 Location "B" taken 3 June 1985.

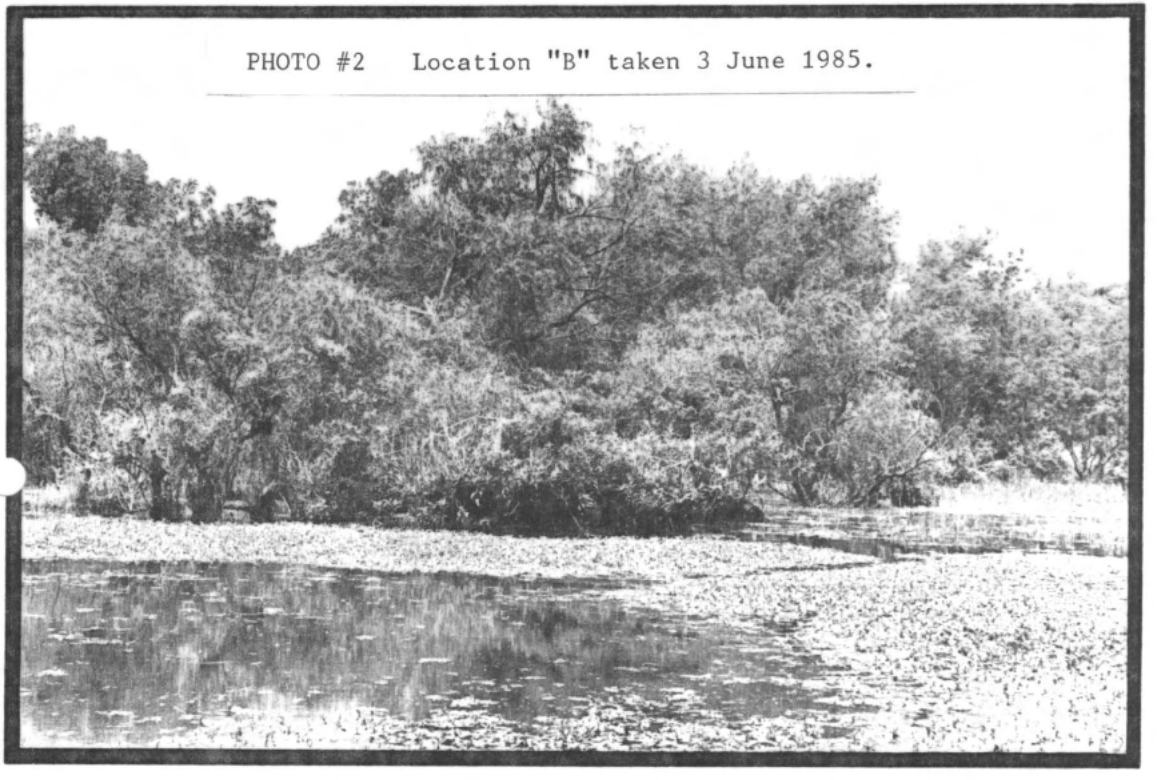


PHOTO #3 This photo shows the average depth of Location "B" and was taken 3 June 1985.

PHOTO BY: KAREN MYERS
WELLINGTON, KANSAS

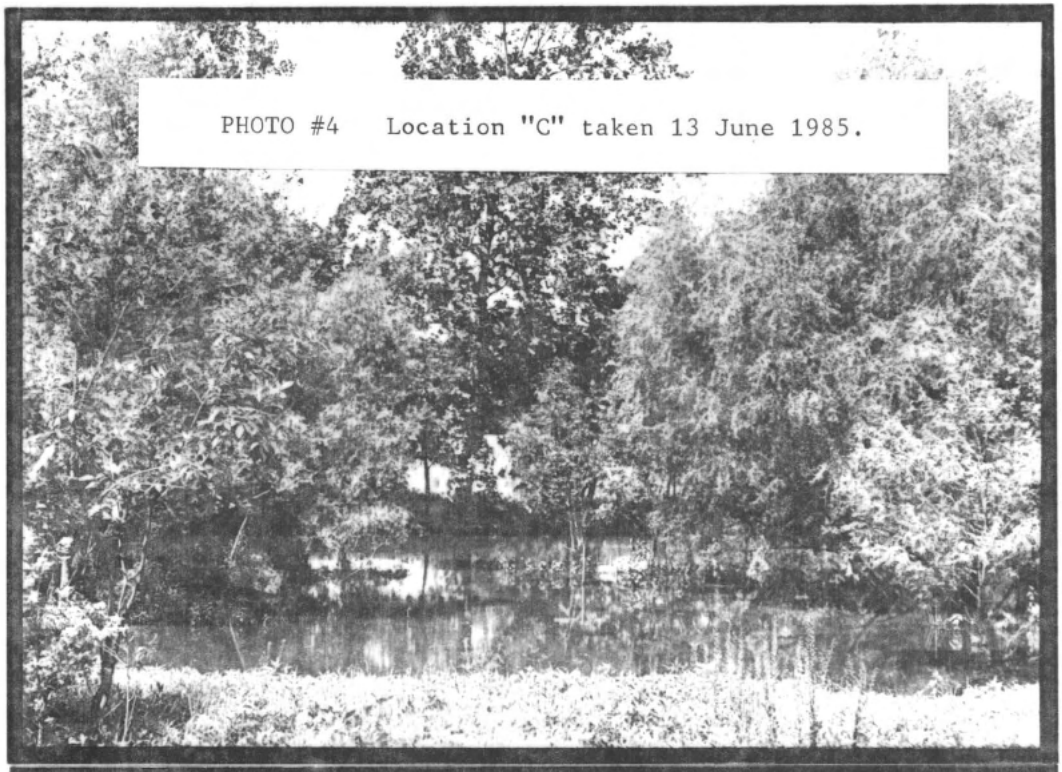


PHOTO #4 Location "C" taken 13 June 1985.

PHOTO #5 Adult male green frog collected from Location "B".

ACKNOWLEDGEMENTS

I was assisted by a number of individuals during this project. There assistance made my work much easier and much more enjoyable. I wish to thank J.T. Collins (Museum of Natural History, Lawrence) for taking the time to look up old records, suggestions, and assistance in the field during the project, Tom R. Johnson (Missouri Department of Conservation) for loaning me a tape of the green frog call and suggestions. Both of these men saved me many hours of work and many miles of driving.

I was also assisted in the field by a number of people that helped with the collection of animals, photography, and field notes. They included: Suzanne L. Collins (Lawrence), Kelly Irwin (Wakarusa), Janet Morris (Caldwell), Mary Morris (Caldwell), Ronnie Morris (Caldwell), Russell Morris (Caldwell), Jeremy Myers (Wellington), Karen Myers (Wellington), and Lori Roberson (Mulvane). I am most greatful for their help.

Marvin D. Schwilling (Project Leader for Nongame & Endangered Wildlife, Emporia) made suggestions and provided encourgement for the project. Funding was provided by the Nongame Wildlife Program of the Kansas Fish and Game Commission. Without such funding this project would not have been possible. I wish to express my thanks at this time.

LITERATURE CITED

Collins, J.T.
1982. Amphibians and reptiles in Kansas. Second edition. Univ. Kansas Mus. Nat. Hist. Pub. Ed. Ser., 8: 1-356.

Conant, R.
1975 A field guide to reptiles and amphibians of eastern and central North America. Second edition. Houghton-Mifflin Company, Boston. xviii + 429pp.

Johnson, T.R.
1977 The amphibians of Missouri. Univ. Kansas Mus. Nat. Hist. Pub. Ed. Ser., 6: 1-142.

Smith, H.M.
1932 A report upon amphibians hitherto unknown from Kansas. Trans. Kansas Acad. Sci., 35:93-96.