INVENTORIES OF AMPHIBIANS AND REPTILES IN ILLINOIS

FINAL REPORT

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December 27, 1991

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ACKNOWLEDGMENTS

Several students in the fall 1990 and summer 1991 SIUC herpetology courses assisted in field work in Monroe and Randolph counties and contributed distribution and activity information; included among these were William M. Dunk, Julie Howard, Eric Klay, Angie Machniak, Mark Morris, Tim Pettinelli, John E. Petzing, and Gordon Steck. Mark Bavetz, Doris Brandon, Robert Flick, Steve Karsen, James Martin, Mary Beth Morris, Mike Morris, Richard Perry, Mike Redmer, and Robert Weck, are acknowledged for valuable assistance with field work at various other localities as well. Gordon Steck is preparing a detailed report on the herpetofauna of the Kidd Lake Marsh Natural Area Natural Area as a master's degree research paper.

John Murphy, Plainfield, shared his field notes on various species. Dirk Stevenson, formerly of Belleville and currently conducting vertebrate inventories for the Florida Game and Fresh Water Fish Commission, very kindly provided an unpublished report summarizing his observation of the herpetofauna at Fults Hill Prairie Nature Preserve during the period 1982-1988. Pertinent information about specific species was provided by several people, including: Todd Fink, Hugh Gilbert, Kenneth S. Mierzwa, Edward O. Moll, Joe Newcomb, Randy Nyboer, Chris Phillips, and Elizabeth Steward.

Major contributions to this study were made by Michael Redmer, Itasca, who conducted nearly all of the field work at Green River Conservation Area and environs, and was responsible for preparing that portion of this report. In addition, he has provided a preliminary report on the herpetofauna of five state parks in northwestern Illinois; that report is appended.

We are grateful to the SIUC Department of Zoology for laboratory space and secretarial services. SIUC contributed a portion of RAB's time to this project.

INTRODUCTION

This project consisted of three parts: (1) field herpetological surveys of two areas: (a) Green River Conservation Area, Lee Co.; and (b) Kidd Lake Marsh Natural Area and the adjacent hills (Fults Hill Prairie Nature Preserve, Prairie du Rocher and Renault Herpetological areas) in the vicinity of Prairie du Rocher, Randolph Co; (2) state-wide field surveys of historic and potential sites for one species of rare salamander and four snakes (Hemidactylium scutatum, Elaphe guttata emoryi, Heterodon nasicus gloydi, Masticophis flagellum flagellum, and Nerodia erythrogaster neglecta), and (3) compilations of existing information on Illinois populations of three additional species (Gastrophryne carolinensis, Crotalus horridus, and Tantilla gracilis).

Therefore, this report is arranged into five major sections: **Part I**, Monroe and Randolph county surveys; **Part II**, field surveys of specified rare species; **Part III**, species accounts compiling information on additional specified amphibians and reptiles; **Part IV**, Green River Conservation Area, Lee County and vicinity survey, and **Part V**, preliminary report of amphibians and reptiles of five state parks in northwestern Illinois. The last section was not part of the original project, but was contributed by Michael Redmer because its information content supplements the Lee County work.

PART I

HERPETOFAUNAL SURVEY

FULTS HILL PRAIRIE NATURE PRESERVE

KIDD LAKE MARSH NATURAL AREA

PRAIRIE DU ROCHER HERPETOLOGICAL AREA

RENAULT HERPETOLOGICAL AREA

HERPETOLOGICAL SURVEY OF FULTS HILL PRAIRIE NATURE PRESERVE, KIDD LAKE MARSH NATURAL AREA, PRAIRIE DU ROCHER HERPETOLOGICAL AREA, AND RENAULT HERPETOLOGICAL AREA

METHODS

Field work, amounting to more than 1,000 person-hours during 60+ days, was carried out over the 14 months between 28 September 1990 and the end of November 1991. An attempt was made to search for amphibians and reptiles in all available habitats, during daylight hours and at night, during all seasons of the year when they are active (autumn 1990, spring 1991, summer 1991, and autumn 1991). In all, parts of two autumns, one spring, and one very hot, dry summer were available for the field work.

As expected from knowledge of life histories and behavior, sampling of most species was biased strongly by season of the year. For example, early spring is best for observing most of the amphibians having aquatic breeding habitats, late summer and autumn for juvenile young-of-the-year anurans, early spring and late autumn for several of the rare snakes.

The most productive method for examining surface activity of amphibians and reptiles, particularly those that live in the interface between the bluffs/forested hills and the river floodplain/swampland or move back and forth between the two, was to walk, bicycle, or drive along the bluff road north of Prairie du Rocher salvaging animals killed by the considerable car and truck traffic. Identifiable remains were collected, labeled, and preserved. They document a remarkable level of vehicular predation on bluff road north of Prairie du Rocher. Indeed, most of the Great Plains Rat Snakes found in the area were killed on this road. Although a well-known phenomenon (see Knutson's 1987 discussion of road fauna and the highway habitat), the impact of this busy road on amphibian and reptile populations is striking. It would

be good to consider some structural design for reducing the vulnerability of amphibians and reptiles as they move between Kidd Lake Marsh Natural Area and the forested hills.

Other survey methods were the usual ones for herpetology, and included: searching Fults Creek (Ditch) from a small boat, walking through woodlands, wetlands, and hill prairies, along shorelines of pools, in vernal ponds, in and around buildings, and along and up the hillsides - looking under rocks, logs, damp leaf litter, hillside talus, boards, sheet metal, in and around abandoned buildings - sampling aquatic habitats with dip nets, seines, drift fences, funnel traps, and hand. Frogs identified by their breeding calls were examined for confirmation. Voucher photographs or preserved specimens were retained of significant finds.

A computer database (Microsoft Works, Macintosh SE/30) was constructed from the field notes of the several project participants. Information in it may be retrieved by species, locality, date, observer, habitat, and observations, such as number of animals, stage of life cycle, condition (live or dead), and time of day. Much of this information is summarized in the following species accounts.

Table 1 (page 57) contains a summary of distribution of species among the six geographic areas examined: (1) vicinity south of Prairie du Rocher Herpetological Area (area from Route 155/bluff road junction at Prairie du Rocher south to Roots Road), (2) Prairie du Rocher Herpetological Area (PHA), (3) Renault Herpetological Area (RHA), (4) Kidd Lake Marsh Natural Area (KLM), (5) Fults Hill Prairie Nature Preserve (FHP), and (6) vicinity north of Fults Hill Prairie Nature Preserve as far as Valmeyer. In addition, relative abundance of each species within the general area is classified, on the basis of number of individuals observed and number of geographic areas, as: Abundant: hundreds observed in at least 5 of the 6 areas,
Common: few to dozens observed in from 4-6 areas,
Uncommon: 3 or more animals observed in 2-3 areas,
Rare: 1-3 observed in only 1 area.

RESULTS

Fifty species of amphibians and reptiles were recorded from the area. Of the 50, 6 were salamanders, 13 frogs and toads, 7 turtles, 5 lizards, and 19 snakes (Tables 1-2, pages 57-60). This includes all but ten (Eurycea lucifuga, Scaphiopus holbrookii holbrookii, Rana sylvatica, Ophisaurus attenuatus attenuatus, Heterodon nasicus gloydi, Masticophis flagellum flagellum, Storeria occipitomaculata occipitomaculata, Nerodia rhombifer rhombifer, Nerodia erythrogaster flavigaster, and Agkistrodon piscivorus leucostoma) recorded previously from the area.

Four of the 50 (Ambystoma maculatum, Sternotherus odoratus, Apalone spinifera ssp., and Virginia valeriae elegans) had not been recorded previously from the area. Two of these, however, were observed by Stevenson (pers. comm.) in 1982-1988.

Nine additional amphibians and reptiles not yet reported from the area might be found there in the future: Ambystoma opacum, Siren intermedia nettingi, Pseudacris streckeri illinoensis, Terrapene ornata ornata, Apalone mutica mutica, Opheodrys vernalis, Pituophis melanoleucus sayi, Thamnophis radix radix, and Tropidoclonion lineatum.

From the 1990-1991 observations (Tables 1-2, pages 57-60), we judge seven amphibians and reptiles (Bufo americanus charlesmithi, Bufo woodhousii fowleri, Acris crepitans blanchardi, Pseudacris crucifer crucifer, Pseudacris triseriata triseriata, Gastrophryne carolinensis, and Rana utricularia utricularia) to be adundant in the Kidd Lake Marsh Natural Area/Fults Hill Prairie Nature Preserve area, and 19 more to be common (Ambystoma texanum, Plethodon glutinosus, Hyla chrysoscelis, Hyla versicolor, Rana catesbeiana, Rana clamitans melanota, Rana blairi, Chelydra serpentina serpentina, Chrysemys picta ssp., Trachemys scripta elegans, Terrapene carolina carolina, Cnemidophorus sexlineatus ssp., Eumeces fasciatus, Nerodia sipedon ssp., Thamnophis proximus proximus, Thamnophis sirtalis sirtalis, Coluber constrictor foxii, Lampropeltis getula holbrooki, and Lampropeltis

calligaster calligaster). All of the abundant species are widespread anurans that breed in lowland aquatic habitats throughout the area. The judgment between "abundant" and "common" may, therefore, rest more upon the higher probability that individuals of these species will be encountered because of their distinctive spring breeding vocalizations rather than on higher actual population densities.

Eight amphibians and reptiles are judged rare (Ambystoma tigrinum tigrinum, Sternotherus odoratus, Apalone spinifera ssp., Sceloporus undulatus hyacinthinus, Carphophis amoenus helenae, Regina grahamii, Virginia valeriae elegans, and Crotalus horridus). Two of these (Carphophis amoenus helenae and Virginia valeriae elegans) are burrowing species that probably are more abundant in moist rock woodlands or woods edges than they would appear to be from the number of specimens found. Two reclusive turtles (Sternotherus odoratus and Apalone spinifera ssp.) and a burrowing water snake (Regina grahamii) may actually be more abundant than they appear. The tiger salamander is a common species of more upland habitats in Illinois, the fence swift is a woodland and forest-edge lizard that is common in the Shawnee Hills, and the timber rattlesnake seems to be suffering population declines in much of its remaining range in Illinois.

Of the remaining 16 species, 11 were encountered relatively infrequently and are judged to be uncommon (Notophthalmus viridescens louisianensis, Scincella lateralis, Eumeces laticeps, Heterodon platirhinos, Diadophis punctatus ssp., Opheodrys aestivus, Elaphe guttata emoryi, Elaphe obsoleta obsoleta, Lampropeltis triangulum syspila, Tantilla gracilis, and Agkistrodon contortrix ssp.).

Five amphibians and reptiles (Ambystoma maculatum, Eurycea longicauda ssp., Rana palustris, Graptemys pseudogeographica ssp., and Storeria dekayi wrightorum) defied adequate classification by these criteria. Two dozen spotted salamanders were observed migrating toward breeding habitat in Kidd Lake Marsh Natural Area. Had they been observed at additional localities they would have been judged common. Likewise,

SPECIES OF PROBABLE OCCURRENCE

Ophisaurus attenuatus attenuatus, western slender glass lizard. - This species is known from SW Monroe County (Smith, 1961), but was not seen by Stevenson (pers. comm.) during 1982-1988, nor by us.

Heterodon nasicus gloydi, dusty hognose snake. - This subspecies is known in Illinois only from one specimen from a hill prairie near Fults (Moll, 1962; Smith and Smith, 1962). If the collection locality for this specimen is correct, it should still occur in the area. However, no additional specimen has been reported and the collection locality has been questioned (Morris and Smith 1981).

Storeria occipitomaculata occipitomaculata, northern redbelly snake. - Smith (1961) recorded this snake from Monroe County and Stevenson (pers. comm.) found two individuals at Fults Hill Prairie Nature Preserve, an adult crossing bluff road and a newborn in leaf litter of a ravine. There is no reason to think this uncommon forest snake does not persist all along the hills north of Prairie du Rocher even though we did not see it.

Nerodia erythrogaster flavigaster, yellowbelly water snake. - We were surprised not to see this snake along Fults Creek and the Kidd Lake Marsh Natural Area lowlands where Stevenson (pers. comm.) considered it common during 1982-1988. Smith (1961) plotted several localities along the SW edge of Monroe County and the habitat certainly appears appropriate.

Nerodia rhombifer rhombifer, diamondback water snake. - Same comments as for N. erythrogaster flavigaster.

Agkistrodon piscivorus leucostoma, western cottonmouth. - The cottonmouth occurs in the Mississippi River floodplain from Jackson County southward, and in the Cache and Ohio river drainages of the far southern counties. It is reported (Cope, 1877) but undocumented from Mount Carmel (Wabash County). An apparently disjunct population has been recorded from "... a marsh near Fults, Monroe County" (Smith, 1961:264) as

the northernmost locality known in Illinois. Indications are that this population persists, but we have not yet documented it. According to local naturalists, cottonmouths once were common here (Stevenson, pers. comm.). Again according to Stevenson, Ralph Axtell and Hugh Gilbert each saw an individual on bluff road near Fults Hill Prairie Nature Preserve in 1980, as did Andy West, a Department of Conservation employee. The population may have been extirpared since then, but that seems unlikely. If it has not, individuals should begin to reappear as Kidd Lake Marsh Natural Area is restored.

Ambystoma opacum, marbled salamander. - Monroe County is near the SW edge of the range of this species; it continues northward into St. Louis and Lincoln counties, Missouri (Johnson, 1987). Smith (1961) plotted an eastern Monroe County record and Thurow and Sliwinski (1991) claim to have seen it there. It would be expected to occur in the Kidd Lake Marsh Natural Area and adjacent forested hills where ample adult habitat and fall breeding habitat exists.

Eurycea lucifuga, cave salamander. - This spring and cave species of the Ozark uplift and Shawnee Hills occurs along the Mississippi River border from Perry County to St. Louis County in Missouri (Johnson, 1987), and from Alexander to Monroe County in Illinois (Smith, 1961). Thurow and Sliwinski (1991) report seeing it in NW Monroe County and Stevenson (pers. comm.) saw one individual at the base of a bluff. Although we found a similar species, Eurycea longicauda, to be relatively common, we have not yet seen the cave salamander. Habitat, however, seems to be available.

Siren intermedia nettingi, western lesser siren. - The range of this burrowing aquatic salamander, very common in far southern Illinois, follows floodplains and reaches its northwesternmost extent along the Illinois River. Smith (1961) accepted Hurter's (1911) record for Monroe County, and records on the Missouri side of the Mississippi River extend as far north as St. Louis and Lincoln counties (Johnson, 1987). It surely occurs along the floodplain edge north of Prairie du Rocher, including Kidd Lake Marsh Natural Area, but we have not yet seen it.

Scaphiopus holbrookii holbrookii, eastern spadefoot. - The eastern spadefoot has been reported from the bluff road 3 mi N of Fults, Monroe County (Brandon and Austin, 1966). According to Stevenson (pers. comm.), that population persists. Observations of surface activity by this burrowing frog are notoriously sporadic. There is no reason to suppose it does not also occur in the vicinity of Kidd Lake Marsh Natural Area.

Rana sylvatica, wood frog. - Although observations of wood frogs in southern Illinois are scattered and infrequent, Monroe County lies within its documented range. According to Gilbert (pers. comm.), there is a population south of Valmeyer. Wood frogs might eventually be found in the Kidd Lake Marsh Natural Area.

Table 1. Observations of amphibians and reptiles during 1990-1991 field work. Indicated are overall relative abundances along the bluffs and adjacent lowlands of Randolph and Monroe counties, and occurrence at the following localities: vicinity south (VS), Prairie du Rocher Herpetological Area (PHA), Renault Herpetological Area (RHA), Kidd Lake Marsh Natural Area (KLM), Fults Hill Prairie Nature Preserve (FHP), and vicinity north (VN)[1].

Species	Apparent overall abundance	VS	PHA	RHA	KLM	FHP	VN
Family Salamandridae							
Notophthalmus viridescens	U				X	X	
Family Ambystomatidae							
Ambystoma texanum	C	X			X	X	X
Ambystoma maculatum	U/C[2]				X		
Ambystoma tigrinum	R				X		
Family Plethodontidae							
Plethodon glutinosus	C			X	X	X	X
Eurycea longicauda	U/C[2]			X	X		X
Family Bufonidae							
Bufo americanus	A	X	X	X	X	X	X
Bufo woodhousii	A	X	X	X	X	X	X
Family Hylidae							
Acris crepitans	A	X	X	X	X	X	X
Hyla chrysoscelis	C	X	X	X	X	X	X
Hyla versicolor	C	?	?	?	X	X	X
Pseudacris crucifer	A	X	X	X	X		X
Pseudacris triseriata	A	X	X	X	X	X	X
Family Microhylida							
Gastrophryne carolinensis	A	X	X	X	X	X	X
Family Ranidae							
Rana catesbeiana	C	X	X	X	X	X	X
Rana clamitans	C		X	X	X		X
Rana utricularia	A	X	X	X	X	X	X
Rana blairi	C	X	X	X	X	X	X
Rana palustris	U/C[2]		X		X		X
Family Chelydridae							
Chelydra serpentina	C		X	X	X		X
Family Kinosternidae							
Sternotherus odoratus	R				X		
Family Emydidae							
Terrapene carolina	C	X		X	X		X
Trachemys scripta	C	X	X	X	X	X	
Chrysemys picta	C	X	X		X	X	
Graptemys pseudogeographica	U/C[2]				X		

Family Trionychidae							
Apalone spinifera	R				X		
Family Teiidae							
Chemidophorus sexlineatus	C	X	X	X	X	X	
Family Iguanidae							
Sceloporus undulatus	R						X
Family Scincidae							
Scincella lateralis	U				X	X	
Eumeces fasciatus	C	X	X	X	X		
Eumeces laticeps	U			X	X		
Family Colubridae							
Carphophis amoenus	R				X		
Nerodia sipedon	C	X	X		X		X
Regina grahamii	R				X		
Storeria dekayi	C/A[2]			X	X	X	X
Thamnophis proximus	C	X		X	X		X
Thamnophis sirtalis	C	X	X	X	X	X	X
Heterodon platirhinos	U	X			X		X
Diadophis punctatus	U			X	X		X
Coluber constrictor	C	X	X	X	X		X
Opheodrys aestivus	U	X			X		X
✓Elaphe guttata	U		X	X	X		
Elaphe obsoleta	U		X	X			X
Lampropeltis getula	C	X	X		X	X	X
Lampropeltis triangulum	U					X	X
Lampropeltis calligaster	C	X	X	X			X
Tantilla gracilis	U			X	X		
Virginia valeriae	R			X			
Family Crotalidae							
Agkistrodon contortrix	U				X	X	X
Crotalus horridus	R				X		

[1] VN = on and along bluff road from N end of Fults Hill Prairie Nature Preserve to Valmeyer
FHP = Fults Hill Prairie Nature Preserve and adjacent bluff road
KLM = Kidd Lake Marsh Natural Area, adjacent bluff road, and both roadsides
RHA = Renault Herpetological Area and bluff road and roadsides between G Road and Kaskaskia Road
PHA = Prairie du Rocher Herpetological Area and bluff road and roadsides between Route 155 and G Road

[2] On the basis of number of individuals observed, these species would have been considered relatively more abundant had they been found at more localities.

Table 2. Amphibians and reptiles observed at study sites in Monroe/Randolph counties, Illinois, during autumn 1990 through autumn 1991. Indicated are apparent relative adundances, number of sites (N = 6, Table 1) where observed, and number of individuals observed.

Species	Apparent relative abundance	Number of sites	Number of individuals
Family Salamandridae			
Notophthalmus viridescens	U	2	4
Family Ambystomatidae			
Ambystoma texanum	C	4	26
Ambystoma maculatum	U/C[1]	1	24
Ambystoma tigrinum	R	1	2
Family Plethodontidae			
Plethodon glutinosus	C	4	~ 40
Eurycea longicauda	U/C[1]	3	~ 85
Family Bufonidae			
Bufo americanus	A	6	hundreds
Bufo woodhousii	A	6	hundreds
Family Hylidae			
Acris crepitans	A	6	hundreds
Hyla chrysoscelis	C	6	dozens
Hyla versicolor	C	3-6[2]	dozens
Pseudacris crucifer	A	5	hundreds
Pseudacris triseriata	A	6	hundreds
Family Microhylida			
Gastrophryne carolinensis	A	6	few hundred
Family Ranidae			
Rana catesbeiana	C	6	~ 90
Rana clamitans	C	4	~ 20
Rana utricularia	A	6	hundreds
Rana blairi	C	6	dozens
Rana palustris	U/C[1]	3	~ 50
Family Chelydridae			
Chelydra serpentina	C	4	10
Family Kinosternidae			
Sternotherus odoratus	R	1	1
Family Emydidae			
Terrapene carolina	C	4	7
Trachemys scripta	C	5	dozens
Chrysemys picta	C	4	26
Graptemys pseudogeographica	U/C[1]	1	7

Family Trionychidae			
Apalone spinifera	R	1	3
Family Teiidae			
Chemidophorus sexlineatus	C	5	dozens
Family Iguanidae			
Sceloporus undulatus	R	1	2
Family Scincidae			
Scincella lateralis	U	2	4
Eumeces fasciatus	C	4	9
Eumeces laticeps	U	2	8
Family Colubridae			
Carphophis amoenus	R	1	1
Nerodia sipedon	C	4	11
Regina grahami	R	1	3
Storeria dekayi	C/A[1]	3	~ 330
Thamnophis proximus	C	3	19
Thamnophis sirtalis	C	6	34
Heterodon platirhinos	U	3	3
Diadophis punctatus	U	3	3
Coluber constrictor	C	5	20
Opheodrys aestivus	U	3	5
Elaphe guttata	U	3	6
Elaphe obsoleta	U	3	6
Lampropeltis getula	C	5	17
Lampropeltis triangulum	U	2	3
Lampropeltis calligaster	C	4	10
Tantilla gracilis	U	2	4
Virginia valeriae	R	1	1
Family Crotalidae			
Agkistrodon contortrix	U	3	13
Crotalus horridus	R	1	2

[1] On the basis of number of individuals observed, these species would have been considered relatively more abundant had they been found at more localities

[2] Before May 9, 1991, *Hyla versicolor* complex frogs were not identified to species

Hemidactylium scutatum

Four-toed Salamander

Neill (1963:2.1) used the expression "egregiously discontinuous" to describe the relatively continuous range of this species in northeastern United States and adjacent Canada that gives way to numerous disjunct, apparently relict, populations to the south and west (Indiana, Illinois, Missouri, Arkansas, Oklahoma, Louisiana, Mississippi, and Florida). This sort of distribution (compare Neill's 1963 map with that of Conant and Collins, 1991) has been interpreted (Smith, 1957) as resulting from the southward movement of a boreal species during Pleistocene glaciation and subsequent range constriction related to post-Pleistocene climate change and development of the Prairie Peninsula.

At the time Smith (1961) summarized the distribution of amphibians and reptiles, four-toed salamanders were known in Illinois only from old records from the Northeastern ~~Mesic~~ Morainal Woodlands Division of extreme northeastern Illinois (Cook and Lake counties). Herpetologists in northeastern Illinois, for example Ken Mierzwa (pers. comm.) and Mike Redmer (pers. comm.) doubt the species persists there since habitats at the historic sites have been destroyed.

During the period 1965-1991, seven disjunct populations of four-toed salamander have been reported in Illinois (Lynch, 1965; Smith, 1974; Schramm and Nordgren, 1978; Frankland and Vogel, 1980; Thurow, 1981; Thurow and Sliwinski, 1991; and Philips, pers. comm.), in Ogle, Jersey, Knox, McDonough, Lawrence, Rock Island , and Vermilion counties, respectively. We have visited all of these except the one at Knox College's Green Oaks Biological Field Station, which John Murphy (pers. comm.) considered the best population of this species in Illinois, and the one in NW Rock Island County for which no detailed locality was given.

We were unsuccessful in finding four-toed salamanders at several localities in and near Pere Marquette State Park. The habitat looks favorable and there is no reason to

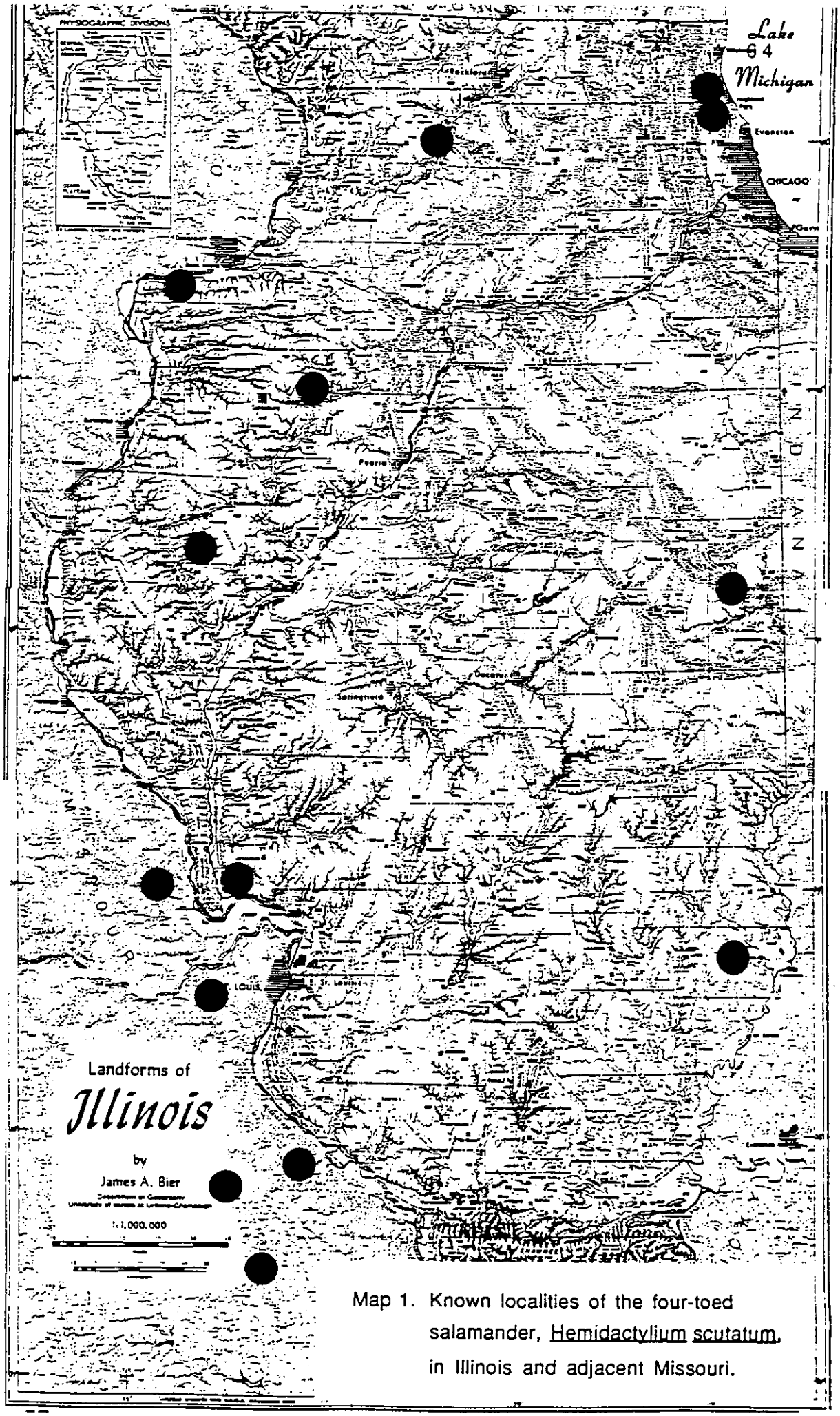
doubt the species still occurs there and will be seen again under favorable conditions of habitat moisture and salamander bahavior.

Chris Philips took us to his new locality in Vermilion County, but at the wrong time of year to find individuals active at the surface.

A locality in McDonough County was searched unsuccessfully.

In several trips to Castle Rock State Park, Ogle County, neither we, Mike Redmer, Ken Mierzwa (pers. comm.), nor John Murphy (pers. comm.) found any specimens, although the habitat is suitable.

On October 11, 1991, Todd Fink showed us a ravine in Red Hills State Park, Lawrence County, where he previously had confirmed Thurow's (1981) report of this species. Individuals were abundant on moist (but not wet) sandy soil under superficial cover (logs, branches, leaves), six of them under the same branch. We easily found and measured 18 individuals (29-42 mm snout-vent) along the lower sides of all four spring-fed ravines examined and could have found even more. This is an outstanding locality for four-toed salamanders, and clearly demonstrates that this species does not require bog-like habitats. Apparently, they burrow into the damp sandy soil along the spring-fed ravines and probably deposit eggs under vegetation and debris along the stream or seep-spring margins. Eggs should be looked for during May. Three vouchers were returned to the lab where they were photographed, videotaped, and preserved. Other herptiles found along the ravines were Acris crepitans, Terrapene carolina, and Pseudacris triseriata triseriata.



Map 1. Known localities of the four-toed salamander, Hemidactylium scutatum, in Illinois and adjacent Missouri.

PART II

FIELD SURVEYS OF HISTORIC AND POTENTIAL SITES

Abbreviations for collections listed in Parts II and III are:

CAS	Chicago Academy of Science
CNHM (FMNH)	Chicago Natural History Museum (Field Museum of Natural History)
EIU	Eastern Illinois University
INHS	Illinois Natural History Survey
MAM	Michael A. Morris
RAB	Ronald A. Brandon
SIUC	Southern Illinois University at Carbondale
SIUE	Southern Illinois University at Edwardsville
UIMNH	University of Illinois Museum of Natural History
ULVC	University of Louisville Collection of Vertebrates
UMMZ	University of Michigan Museum of Zoology
USNM	United States National Museum

Elaphe guttata emoryi

Great Plains Rat Snake

As its common name implies, this is a snake of the Great Plains where it is more often found not in open fields, but in canyons or rocky draws, and on hillsides (Conant and Collins, 1991) from northesastern Mexico northeastward to Jefferson County, Missouri (Johnson, 1987). It also occurs in brush fields, open woodland, and around trash dumps and old buildings (Ernst and Barbour, 1989). In southern Missouri, it occurs in open woodlands and rocky, wooded hillsides (Johnson, 1987).

Like the coachwhip and flathead snake, the Great Plains Rat Snake occurs east of the Mississippi River only along the Mississippi River bluffs of Illinois. It has been found from Principia College in Jersey County to just north of Prairie du Rocher in Randolph County (Smith, 1961; Brandon and Austin, 1966; Moll, 1962).

As of 30 years ago (Smith, 1961), four specimens of this snake had been found dead on the Prairie du Rocher/Valmeyer bluff road in Randolph/Monroe counties, including the first one recorded for the state (Smith and Burger, 1950) and two that had been found at Principia College in Jersey County. Smith (1961) evaluated other literature records for this snake and accepted as valid sight records from Alton, Madison Co. (Smith and Burger, 1950), and from the vicinity of East St. Louis, St. Clair Co. (Neill, 1951).

The known distribution of this snake in Illinois remains as mapped by Morris and Smith (1981). In Illinois, the species appears restricted to the vicinity of the Mississippi River bluffs from extreme western Randolph Co. northward into Jersey Co. It is questionable whether extant populations remain in Madison and St. Clair counties, but several specimens have been found along the driftless portion of Monroe and Randolph counties during the years 1961-1976. For example, Moll (1962) reported the Schroder specimen (UIMNH 50837, collected 21 April 1957); Duever and field companions collected one (UIMNH 50963, 12 May 1961); Brandon and Austin (1966) found two males, one female, and a juvenile on 14-22 May, 1965 (SIUC R-1234,

1238, 1202); Morris and Boyd found a specimen on 15 June 1976 (INHS 10277); and Daleske found another 19 June 1971 (FMNH 191054). During the 1970s, Hugh Gilbert made notes on seven individuals found near Fults. Stevenson (pers. comm.) found a juvenile on bluff road just S of Fults Hill Prairie Nature Preserve in April 1984, and has seen several adults dead on bluff road near Fults.

During 1990-1991 field work, we found seven specimens along the bluff that extends from Prairie du Rocher, Randolph County, to Valmeyer, Monroe County. Four of the six (three adults and one juvenile) had been killed by vehicles on the bluff road and three (one juvenile male and two adult males) were captured alive along the road. The DOR specimens were found during late autumn (5 October, 19 October, and 4 November) and spring (16 May), and the live ones, all males, were found during spring (9 and 13 May). All known localities are given below.

Localities: **Jersey County**. Principia College near Elsah (Smith, 1961). **Madison County**. Alton (Smith and Burger, 1950). **Monroe County**. Bluff road 0.7 mi N of S end of Kidd Lake Marsh Natural Area; bluff road 0.15 mi N of S end of Kidd Lake Marsh Natural Area; old shed at corn drier, 1.2 mi N Randolph Co. line on Prairie du Rocher/Valmeyer Road; 1.2 mi N jct Kaskaskia Road and bluff road (SIUC R-2319); 0.5 mi S jct. G Road and bluff road, across from Renault Herpetological Area (SIUC R-2320); bluff road between Valmeyer and Prairie du Rocher (SIUC R-2329; UIMNH 50837, 50963); 2.5 mi N Prairie du Rocher (SIUC R-1234); 1 mi S Valmeyer (SIUC R-1238); 3 mi N Valmeyer (SIUC R-1202); 8 mi N Fults (SIUC R-1211); 5 mi S Fults (INHS 8869); Fults (FMNH 191054); 3 mi N Prairie du Rocher (INHS 5022, 7151). **Randolph County**. 0.8 mi. S Monroe Co. line on Prairie du Rocher/Valmeyer Road; 1.5 mi N Prairie du Rocher (INHS 4324); 2.5 mi NW Prairie du Rocher (INHS 10277). **St. Clair County**. vicinity of East St. Louis (Neill, 1951).

Map 2. Known distribution of the great plains rat snake, Elaphe guttata emoryi, in Illinois.

Heterodon nasicus gloydi

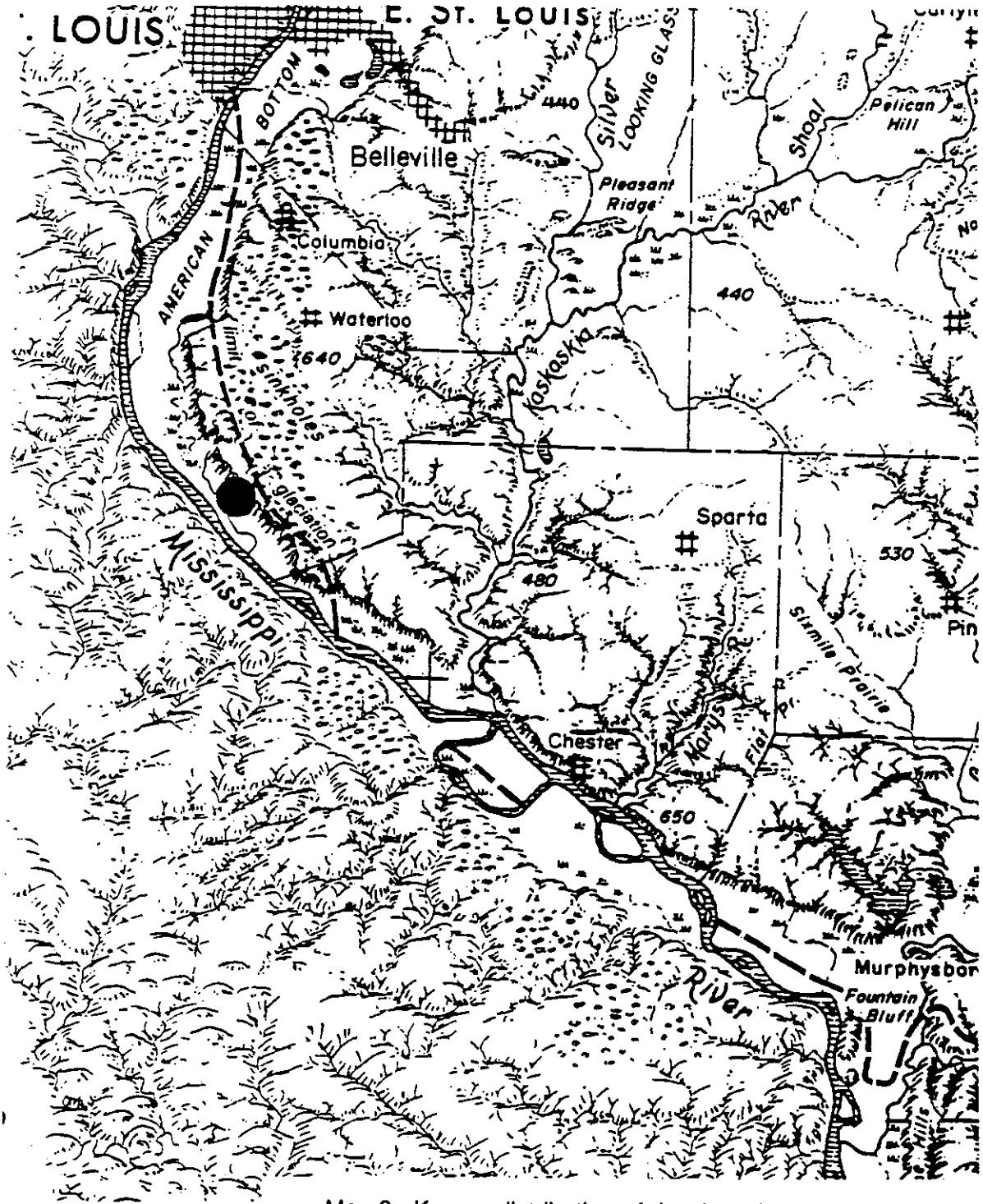
Dusty Hognose Snake

This subspecies is known in Illinois from only one specimen (UIMNH 50769) from "a hill prairie near Fults" (Moll, 1962; Smith and Smith, 1962). The specimen was part of the personal collection of Robert C. Schroder, donated to the University of Illinois after his death. The provenance of this specimen at first was taken at face value, but more recently Morris and Smith (1981:30) considered this record "somewhat questionable."

Other populations of western hognose snakes in the state have been identified (Smith, 1961) as Heterodon nasicus nasicus (Henderson/Mercer counties, Carroll/Rock Island/Whiteside counties, and Lee County) or as intergrades between H. nasicus nasicus and H. nasicus gloydi (Illinois River sand areas from Morgan County to Tazwell County).

We found three eastern hognose snakes in the vicinity of the Monroe County hill prairies, but no H. n. gloydi. The presence of this subspecies in Illinois remains questionable. Were it not for another isolated population in SE Missouri, one could argue that the Monroe County specimen bears erroneous collection data. Even so, a hill prairie seems a peculiar habitat for a species that burrows in sandy or loose soils. It might be more likely to turn up in sandy soils north of Cairo, directly across the Mississippi River from Missouri localities.

As far as other Illinois populations of Heterodon nasicus are concerned, Redmer (report attached) found an adult female H. n. nasicus in Green River Conservation Area, Lee County, and Mierzwa (pers. comm.) has seen individuals at Thompson-Fulton Nature Preserve, in Whiteside County.



Map 3. Known distribution of the dusty hognose snake, Heterodon nasicus gloydi, in Illinois.

Masticophis flagellum flagellum

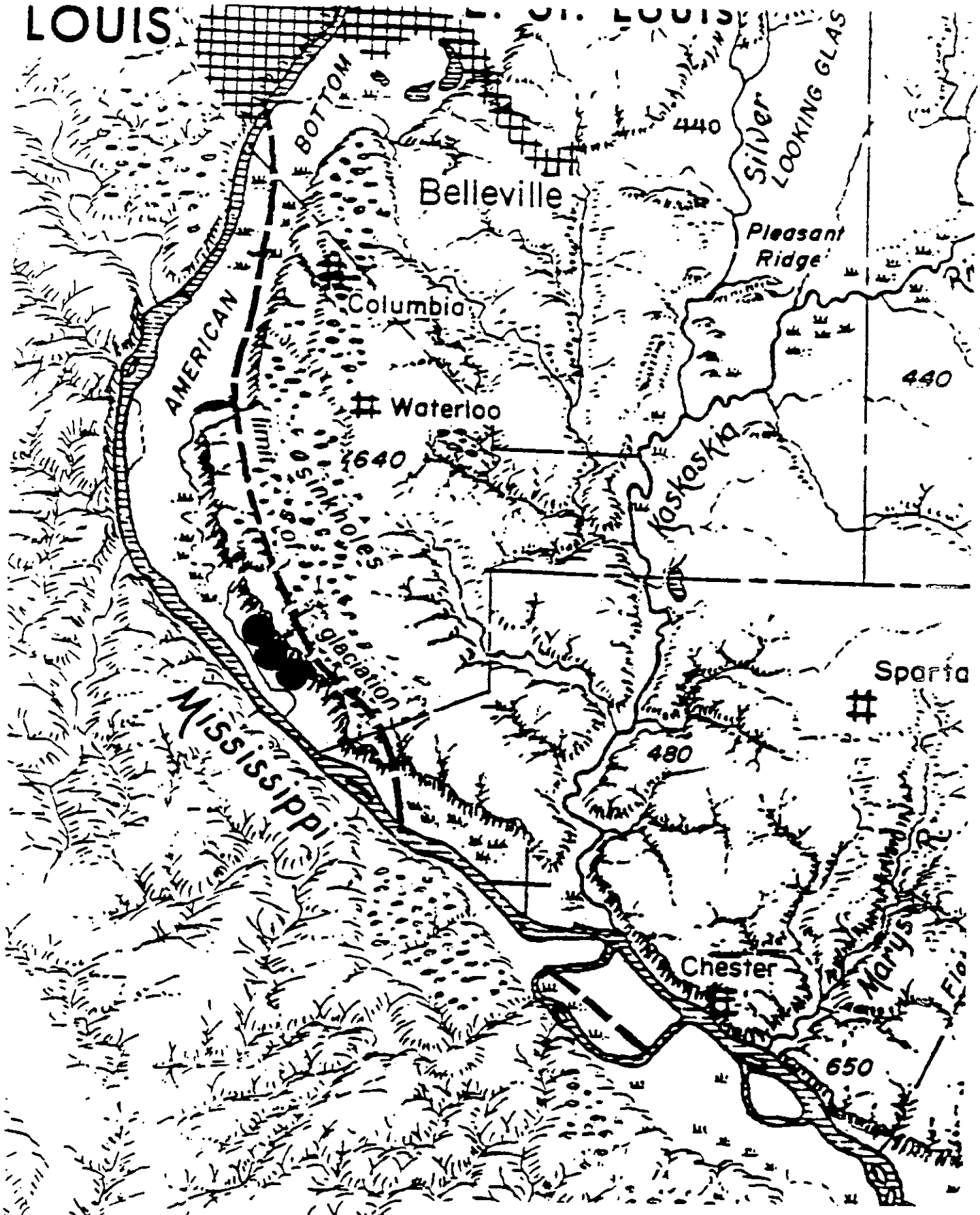
Coachwhip

This species occurs in relatively dry, often open, warm habitats from coast to coast across the southern United States (Wilson, 1970, 1973). It reaches the northernmost extent of its range in central United States in St. Louis County, Missouri, and has crossed the Mississippi River into Monroe County, Illinois. Otherwise, the nearest localities east of the Mississippi River are in central Kentucky and southwestern Tennessee.

In Missouri, coachwhips occur on rocky, brushy, or forested hillsides and in cedar glades (Anderson, 1965; Johnson, 1987). In Illinois, it is known only from the Lower Mississippi Border Division (Smith, 1961) of Monroe County. Smith and Burger (1950), in the first report of coachwhips in Illinois, mentioned two flattened DOR juveniles (INHS 4323 and 4376)-3.5 mi S Fults and 1.5 mi S Fults, respectively-and a third, larger one that leaped from a bluff 2 mi S Fults. All three were seen in October. At least one additional specimen has been collected since then: 0.3 mi N, O.4 mi W jct Bluff & Ivy roads, near Fults (SIUE 563), and another adult apparently was found DOR by Doug Rossman (Smith, 1961). Stevenson (pers. comm.) saw no coachwhip in the vicinity of Fults Hill Prairie Nature Preserve during 1982-1988, but mentioned that Ralph Axtell has seen specimens in the Fults area, crossing the road and near the bluff top.

No coachwhip was seen during our 1990-1991 survey of amphibians and reptiles along the Randolph/Monroe counties bluffs.

A reasonable conclusion is that this species might persist in the Fults area, and more broadly along the forested bluffs to the north in Monroe and and to the south even into Randolph County, but at very low population density. Sight records must be viewed cautiously because of the resemblence between coachwhips and the more abundant racers.



Map 4. Known distribution of the coachwhip, Masticophis flagellum flagellum in Illinois.

PART III

ADDITIONAL COMPILATIONS OF EXISTING INFORMATION

Abbreviations for collections listed in Parts II and III are:

CAS	Chicago Academy of Science
CNHM (FMNH)	Chicago Natural History Museum (Field Museum of Natural History)
EIU	Eastern Illinois University
INHS	Illinois Natural History Survey
MAM	Michael A. Morris
RAB	Ronald A. Brandon
SIUC	Southern Illinois University at Carbondale
SIUE	Southern Illinois University at Edwardsville
UIMNH	University of Illinois Museum of Natural History
ULVC	University of Louisville Collection of Vertebrates
UMMZ	University of Michigan Museum of Zoology
USNM	United States National Museum

Neroria erythrogaster neglecta

Copperbelly Water Snake

The range of Nerodia erythrogaster extends from northeastern Mexico eastward through southern United States to the Atlantic Coastal Plain and northward along the Mississippi and Wabash rivers as far as Rock Island, Illinois, and southern Michigan (Conant and Collins, 1991; Ernst and Barbour, 1989). Two of the four recognized geographic variants, the copperbelly and yellowbelly water snakes, occur in Illinois.

The copperbelly water snake has a discontinuous range in the central midwest and intergrades with the yellowbelly water snake over a relatively broad portion of southern Illinois (Smith, 1961). Smith identified populations in southeastern Illinois as N. e. neglecta, those in western Illinois north of the Shawnee Hills as N. e. flavigaster, and those in Alexander, Bond, Fayette, eastern Jackson, Jefferson, western Johnson, Pulaski, Union, and Williamson counties as intergrades. Smith (1961) identified a disjunct Mississippi River island population in Rock Island County as N. e. neglecta, but Adler (1963) and McCranie (1990) identified it as intergrade between N. e. flavigaster and N. e. neglecta and Conant and Collins (1991) considered it to be N. e. flavigaster. Clearly, the status of this population needs to be clarified by further field work. In Illinois it is not a simple matter to determine the status of the subspecies N. e. neglecta without at the same time carrying out an analysis of geographic variation among all Illinois populations of N. erythrogaster to determine which ones actually are relatively "pure" N. e. neglecta.

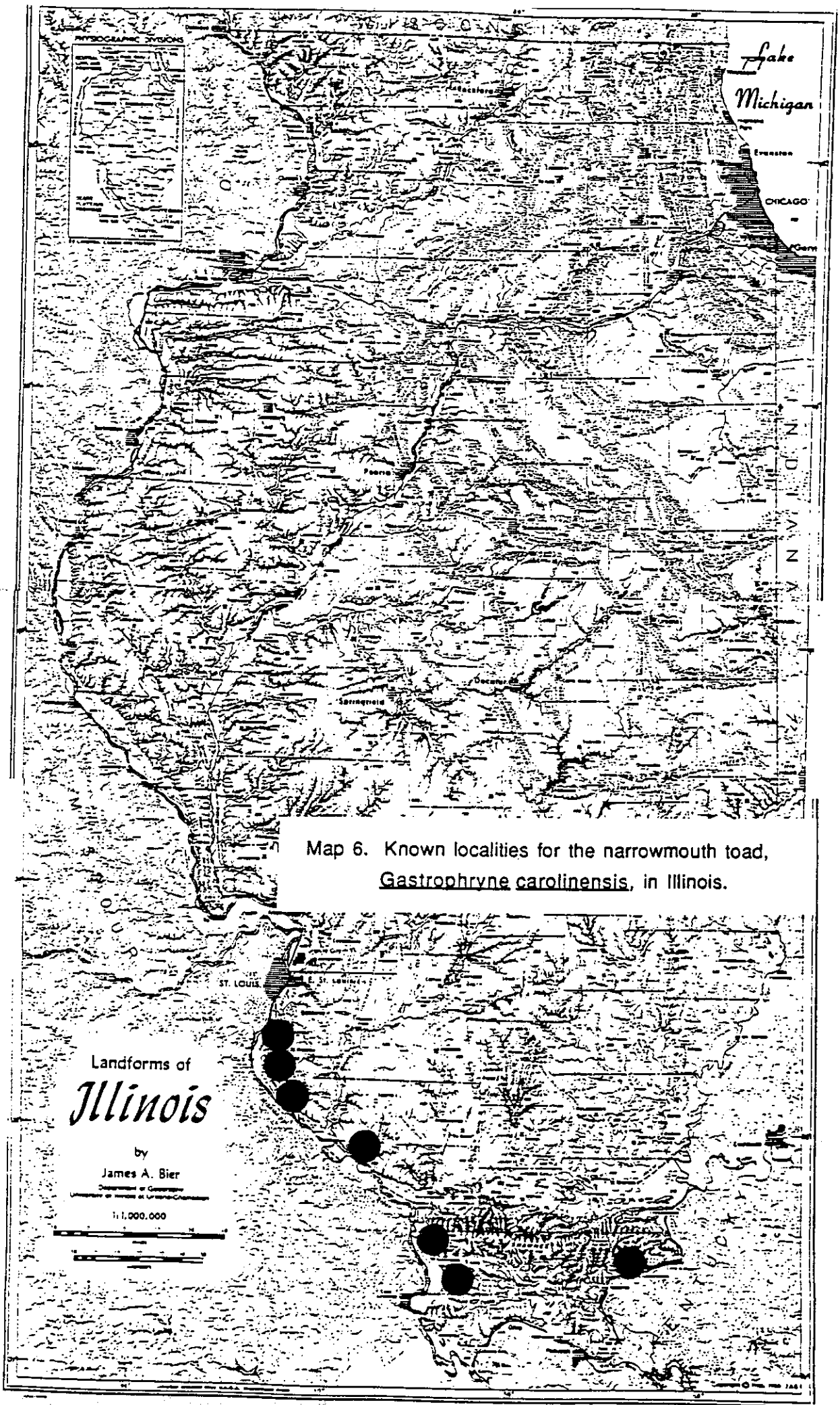
The following populations have been identified as "pure" N. e. neglecta: **Gallatin County**. Saline Mines (INHS 1472). **Johnson County**. 4 km NNE Belknap (Phillippi et al., 1986); Forman (INHS 2456, 3329), 2.4 mi S rt 146, on rt 37 (SIUC R-2249), Belknap (INHS 3361-3362), *Cache River near Belknap* (SIUC R-452), *3 mi N, 1 mi W jct Hwys 146 & 147* (SIUC R-271), *Grantsburg Swamp (Bell Pond), 0.5 mi E Grantsburg* (MAM; Robinson, 1966), SW sect. 12, 1 mi E Grantsburg (SIUC R-

2314), 1 mi W Grantsburg on rt. 146 (SIUC R-2202), *Heron Pond and Little Black Slough* (MAM), Thorn Pond (RAB), Belknap, Cache Creek (SIUC R-542), Cypress Dump Swamp (Robinson, 1966), Little Cypress (UIMNH 50918), White Hill Quarry (Klimstra and Hutchison, 1965), Paine Place, Sect. 35, T13S, R2E (Klimstra and Hutchison, 1965), Marshall Pond, Sect. 12, T14S, R2E (Klimstra and Hutchison, 1965). **Massac County**. Massac County State Park (SIUC R-1235), Mermet Lake Conservation Area (Robinson, 1966), 1/3 mi ESE Boaz (SIUC R-2309). **Pope County**. *Hwy 146 bridge S of jct Hwys 145 & 146* (ULVC), *0.5 mi W Brownfield turnoff on Rt 146* (MAM), Dixon Springs Agricultural Experiment Station, near Glendale (Robinson, 1966; Applegate and Zimbleman, 1978), 1 mi W New Liberty (SIUC R-2312), nr. Bay City (N. Bridge) (SIUC R-2021), 3 mi N, 1 mi W hwys 146 & 147 (SIUC R-271). **Pulaski County**. *Limekiln Slough, near Karnak* (MAM/RAB), Post Creek Cutoff, on rt 169 E of Karnak (RAB), 1.5 mi N Ullin along rt. 51 (SIUC R-2313). **Richland County**. Onley, source of Bonpas Creek (USNM 14156, 14168). **Saline County**. *Eldorado City Reservoir, 2 mi WNW Eldorado* (IUMNH 3064), *Texas City* (INHS), *Saline River bottomlands, 0.5 mi N Texas City on Hwy 45* (MAM). **Wabash County**. *Mt. Carmel* (INHS 1471). **Wabash/Edwards counties**. *Bonpas Creek bottomlands on county line* (RAB); 3 mi E Bone Gap (MAM, RAB). **White County**. *ca. 3 mi S Norris City* (MAM), *Norris City Reservoir* (MAM). The Richland County locality was not cited by Smith (1961), and may be based on misidentifications (Mike Morris, pers. comm.).

During 1987-1990, Sellers (1991, Appendix I) observed at least one copperbelly water snake at 14 localities (italicized above) in southern Illinois. He (p. 32) judged seven in southeastern Illinois to support "viable" populations, but his Appendix I does not indicate which these are. To be considered "viable" (Sellers, 1991:13), a population "...would typically average [+ 50 individuals with + 12 breeding pairs..." Sellers considered the highest quality N. e. neglecta habitats to be those in the upper

Cache River cypress swamps and bottomland sloughs near Shawnee National Forest. It is our impression, as well, that good populations of the copperbelly water snake occur throughout Ohio river tributaries (e.g., upper Cache River, Bay Creek, Saline River system, and at scattered suitable localities northward along the Wabash River and its tributaries. Phillippi et al. (1986) and Brandon and Morris (1988) found copperbelly water snakes at three localities in the Cache River drainage; others have been found since.

During the period 1988-1991, we observed individuals from: **Edwards/Wabash county line**. Bonpas Creek east of Bone Gap (1 adult & 1 juvenile along nearly dry creek bed, 7/8/91); Bonpas Creek E of West Salem (2 in ditch along creek, 6/19/88; 1 along the creek, 7/13/91). **Gallatin County**. 1.5 mi north of Saline Mines (1 adult in woodland rain pool, 3/25/91). **Johnson County**. 2.4 mi S rt 146, on rt 37 (SIUC R-2249, 1 DOR adult); SW sect. 12, 1 mi E Grantsburg (SIUC R-2314, at edge of swamp, 6/27/91); 1 mi W Grantsburg on rt. 146 1 DOR, late May 1989). **Massac County**. 1/3 mi ESE Boaz in remnant swamp (SIUC R-2309, 1 juvenile under log near swamp & railroad, autumn 1991). **Pope County**. 1 mi W New Liberty (1 gravid female, SIUC R-2312, in raided turtle nest by tree roots next to gravel road and swamp, 6/22/91. In November, gave birth to litter of 12 in lab); nr. Bay City (DOR N bridge) (SIUC R-2021, 5/13/89). **Pulaski County**. Thorn Pond, SW sect 31, T13S, R3E (1 in cypress/tupelo pond 6/2/88; 1 juvenile 5/19/88); Post Creek Cutoff, on rt 169 E of Karnak (2 in small streams draining ponds, 6/17/99); 1.5 mi N Ullin along rt. 51 (SIUC R-2313, 1 adult under railroad tie beside track along swamp & ditch, 6/6/91).



Map 6. Known localities for the narrowmouth toad, Gastrophryne carolinensis, in Illinois.

Crotalus horridus

Timber Rattlesnake

The timber rattlesnake once apparently had a relatively extensive range in non-prairie Illinois, occurring across the state south of the Shelbyville Moraine, throughout the Shawnee Hills, along the entire Mississippi River border, along the Wabash and Ohio river borders, in the Wisconsin Driftless Section, along the Illinois River valley at least as far north as La Salle County, and within the southern part of the Galesburg Plain. Within these wooded physiographic regions well dissected by streams, timber rattlesnakes have been found in 33 of the state's 102 counties (see the List of Records), mainly in and along heavy upland forest featuring bluffs and rock outcrops. Some of the bluffs along the Mississippi River border and parts of the Shawnee Hills constitute the least disturbed habitats in Illinois, and there modest populations persist, although many fewer individuals have been encountered than pre-1940 reports described.

Certainly, the distribution of populations in the state today is more limited than in the past and populations are more relict than depicted in field guides and general works such as Ernst and Barbour (1989), Conant and Collins (1991), and others. The general consensus among herpetologists is that population sizes have declined greatly in most of Illinois during the 20th Century as more and more suitable habitat has been converted to human use, and because rattlesnakes seldom survive human encounters. For example, Bielema (1990) failed to find any timber rattlesnake in Mississippi Palisades State Park, Carroll County, although they once were common enough there to justify special measures to eliminate them. As early as 1892, Garman stated that timber rattlesnakes were "...being rapidly exterminated" (Garman, 1892:312). Outside of the Shawnee Hills and the Mississippi River bluffs, most records predate 1950, and many predate 1940. The healthiest remaining Illinois populations apparently are in the Shawnee Hills, but even here the large aggregate den sites, such as once existed at Chalk Bluff, Jackson County, probably are a thing of the past because of over collecting and wanton

killing. As was the case 30 years ago (Smith, 1961), the killing of a rattlesnake usually merits a photograph in the newspaper.

Scattered populations may still occur along the Illinois River valley, but the only recent records are those for La Salle County (Walley, 1963). Many historic populations undoubtedly have been extirpated.

Information on known timber rattlesnake populations, and on others from which animals have not been reported in recent years, is outlined in the following paragraphs dealing with clusters of populations we refer to as: northwest (**NW**), Driftless Section of Jo Daviess and Carroll counties; northcentral (**NC**), Upper Illinois River bluffs of La Salle County; west (**W**), southern Galesburg Plain of Adams, Fulton, Hancock, and McDonough counties; westcentral (**WC**), Upper Mississippi Border Division of Calhoun, Greene, Jersey, and Pike counties; eastcentral (**EC**), Shelbyville Moraine country and vicinity of Coles, Cumberland, Effingham, and Jasper counties; southwest (**SW**), Lower Mississippi Border Division of Monroe, Randolph, and St. Clair counties; and far southern (**FS**), Shawnee Hills and Austroriparian divisions of Alexander, Hardin, Jackson, Johnson, Pope, Pulaski, Saline, and Union counties.

(**NW**) Driftless Section of Jo Daviess and Carroll counties. - Old records exist for 5 mi N Savanna, Apple River, and Galena, and at least some populations persist. Nickerson and Mays (1968) reported two aberrantly striped individuals that had been collected along Apple River bluffs between Elizabeth and Woodbine. During 24 days of 1989-1990, Brian Bielema (1990) found no timber rattlesnakes in Mississippi Palisades State Park. He learned, however, that nine highway maintenance workers made 18 sightings during 1983-1989, and that during the 1930's as many as 30 were killed in the park each year. More recently (1990-1991), Bielema found 13 adults and 3 neonates in a hibernaculum in Hanover Bluff Nature Preserve (Randy Nyboer, pers. comm.). One of us (SB) has seen photographs of these animals, which were found in July and August 1991. According to Nyboer, timber rattlesnakes have been encountered

recently at Apple Canyon Lake. Nyboer also informed us he was told by a Mr. Deininger, of Iowa, that in 40 years of rattlesnake collecting he has known of 16 or 17 populations in NE Iowa and NW Illinois, but estimated the number presently has dropped to around six.

(NC) Upper Illinois River bluffs of La Salle County. - Smith (1961) accepted a La Salle County record on the basis of a photograph of a large specimen killed in 1924 near Bailey Falls. Subsequently, Walley (1963) confirmed its continuing existence in La Salle County by finding six animals in the vicinity of Blackball Mine, near Utica. This population apparently persists.

(W) southern Galesburg Plain of Adams, Fulton, Hancock, and McDonough counties. - It is doubtful that many timber rattlesnake populations persist in this part of the state. Most of the records from this area predate 1941. In their idiosyncratic 1991 list of distributional records, Thurow and Sliwinski gave sight records for S and extreme SW Adams County, and indicated that populations seen by them before 1966 in eastern Hancock County and in SW McDonough County probably have been extirpated.

(WC) Upper Mississippi Border Division of Calhoun, Greene, Jersey, and Pike counties. - Good populations of timber rattlesnakes probably persist in the hills and river bluffs of this area. There were numerous reports from this area during the years 1938-1951, most of them from the driftless hills near Pearl, in SE Pike County. Thurow and Sliwinski (1991) reported seeing timber rattlesnakes in several parts of Pike County. In 1985, a landowner indicated to one of us (SB) that timber rattlesnakes could still be encountered between Nebo and Pearl. In 1985, a den was observed by one of us (SB), north of Belleview, Calhoun County. Fifteen to 20 individuals, three of them gravid, were found on two different bluffs. A landowner said that over 40 individuals had been killed at the same spots the year before. Voucher specimens exist for Jersey County, at Grafton. Workers at nearby Pere Marquette State Park told one of us (SB) that timber rattlesnakes have been killed in the park as recently as 1991.

(EC) Dissected Springfield Plain south of the Shelbyville Moraine in Clark, Coles, Cumberland, Effingham, and Jasper counties. - Smith (1961) considered the timber rattlesnake rare in this part of the state. According to E. O. Moll (pers. comm.), timber rattlesnakes have not been brought in to Eastern Illinois University from Coles County since before World War II, but every now and then during the past 25 years they have been seen from Clark and Cumberland counties. The last specimen brought in from Clark County, 10 years ago, was from a site now covered by Mill Creek Reservoir.

(SW) Lower Mississippi Border Division of Monroe, Randolph, and St. Clair counties. - Timber rattlesnakes have been known from this area at least since early in the century, particularly in hills along the bluff road between Valmeyer and Prairie du Rocher. They still occur along these Mississippi River bluffs, though probably at lower population densities than previously because of the reduced habitat. Department of Conservation personnel found an individual dead on the bluff road near Fults in 1973. During the 1970's, Hugh Gilbert, of Valmeyer, kept field notes on two timber rattlesnakes killed on bluff road near Fults. He has seen as many as four individuals at a den near Valmeyer, and observed two individuals this year. Over the seven-year period 1982-1988, Dirk Stevenson (pers. comm.) found the timber rattlesnake to be uncommon at Fults Hill Prairie Nature Preserve, Monroe County, where he observed individuals on bluff slopes, in forest edge habitats, and crossing bluff road. On 13 August 1991, Gordon Steck found a 111-cm snout-vent animal basking on the railroad embankment 0.45 mi N of the south end of Kidd Lake Marsh Natural Area, Monroe County.

(FS) Shawnee Hills and Austroriparian divisions of Alexander, Hardin, Jackson, Johnson, Pope, Pulaski, Saline, and Union counties. - The timber rattlesnake occurs throughout the forested portions of the Shawnee Hills where, although it could not be called common except when encountered at or near hibernacula, it continues to be seen on a regular basis. Cagle (1942) reported

that it could be collected in abundance near dens along the Mississippi River bluffs during early spring and late autumn, and some dens of this sort probably persist. For many years a particularly extensive exposure of rock bluff along the lower Big Muddy River valley (e.g., Chalk Bluff and Horseshoe Bluff), Jackson County, was famous as a source of specimens for zoos and collectors. Populations persist in these areas, but apparently at much lower densities because of overcollecting and wanton killing by groups of "sportsmen" who as recently as the 1960's annually killed as many snakes as possible near the dens.

A modest population exists at Pine Hills, Union County, where Rossman (1960) found it present but not abundant. E. O. Moll knows of a den that has remained active over the past 20 years. One of us (RB) observed occasional individuals during extensive field work at Pine Hills 25 years ago. During a recent four-year (1987-1990) herpetological survey, one of us (SB) observed several timber rattlesnakes. In September 1987, one adult and one newborn were seen in talus and under a rock ledge. Three were seen in 1988, a live adult male (15 October) and two young-of-the-year killed on the road (SIUC R-1971, R-2035, 25 May and 8 July). Thirteen offspring born to a female killed just E of the Union County Conservation Area were obtained on 2 September from the Joe Newcomb, Shawnee National Forest district ranger. In 1989, one adult was observed 9 October in a denning site.

SUMMARY

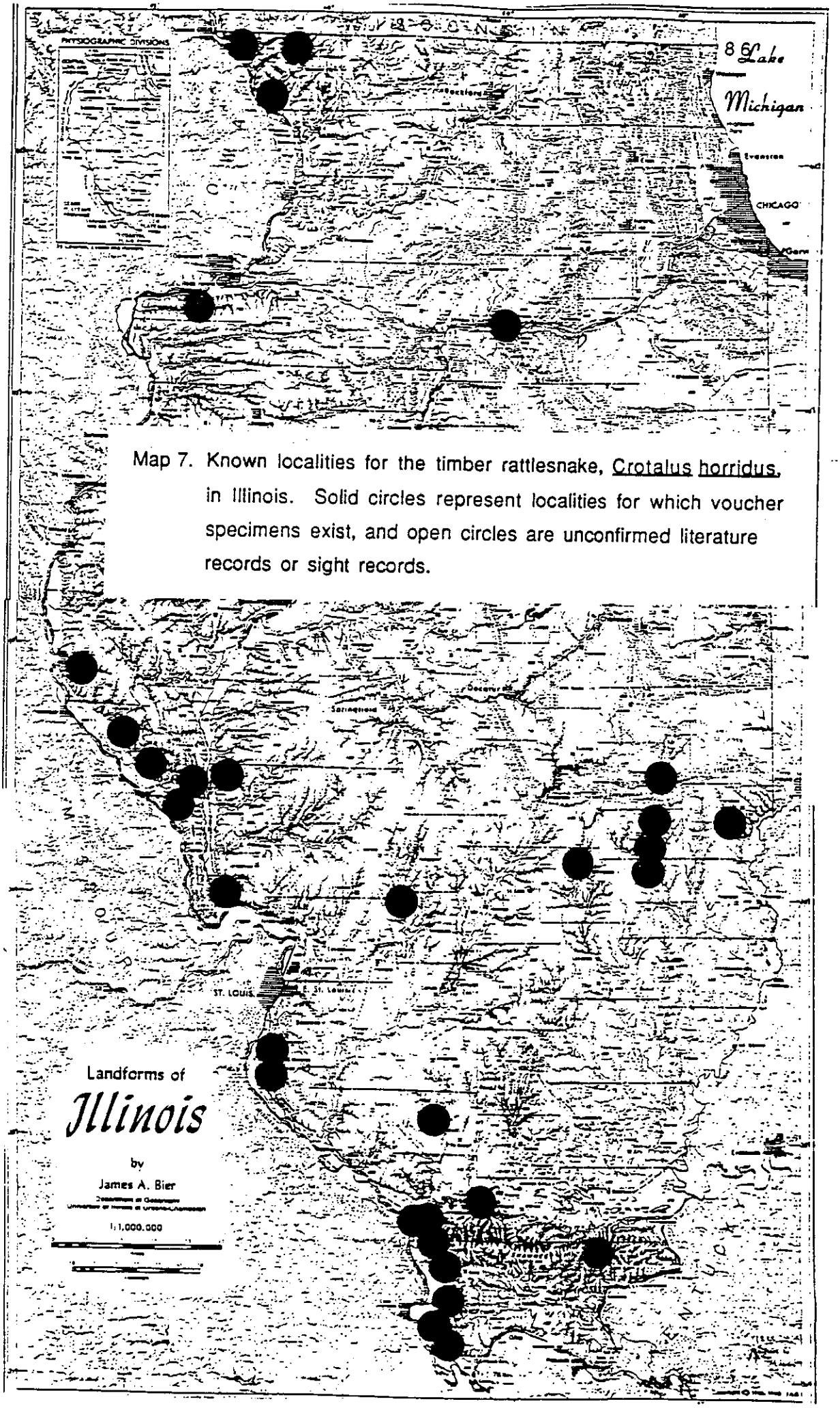
The timber rattlesnake once ranged over most of forested Illinois. Through habitat alteration, its range gradually was reduced to relatively undisturbed refuges of forest and rock bluff in agriculturally undesirable portions of the state. Earlier in the century some of these places harbored large dens, many of them well known to local residents, zoological gardens, and snake collectors. Through further habitat reduction and increased human activity (including

deforestation, reservoir construction, overcollecting, local systematic efforts to eliminate a potentially harmful animal, and the usual fate befalling a rattlesnake seen by a human being) many (most?) of the large dens were decimated and population density lowered. There is ample cause for concern about the continuing existence of the timber rattlesnake in Illinois. With the possible exception of some populations within the Shawnee Hills, populations appear to be in jeopardy.

The timber rattlesnake is known in Illinois from the following localities: **Adams County**: Quincy (CNHM 84056; Gloyd, 1940, LMK 9324-9325); S and SW (Thurow and Sliwinski, 1991). **Alexander County**: Thebes, 1938 (INHS 2260); Olive Branch (CNHM 2140). **Bond County**: Old Ripley (INHS skin). **Calhoun County**: N of Belleview (SIUC R-2321). **Carroll County**: Mississippi Palisades State Park (Bielema, 1990). **Clark County**: (Smith, 1961). **Coles County**: Charleston (EIU; Hankinson, 1917); about 3 mi E Charleston (Hankinson, 1917). **Cumberland County**: 1 mi N Greenup on Highway 130 (Peters, 1942). **Effingham County**: 4 mi E Shumway, 1956 (INHS 8169). **Fulton County**: (Necker, 1939). **Greene County**: 6 mi N Hillview, 1938 (INHS 1548). **Hancock County**: Augusta (Necker, 1939; CNHM 38242-38243); Warsaw (Gloyd, 1940, MPM 671); E before 1966 (Thurow and Sliwinski, 1991). **Hardin County**: Cave Hill area, T9S, R7E, sect. 3; T11S, R8E, sect. 34; T11S, R9E, sect. 16. **Jackson County**: 9 mi SW Murphysboro, 1950 (UIMNH 1214); 10 mi SW Murphysboro, 1942, 1946 (INHS 1814-1816, 1922, UIMNH 84782); 11 mi SW Murphysboro, 1948 (UIMNH 1215-1216); 12 mi SW Murphysboro (SIU 444, 445, 395, 441, 442); Murphysboro, 1947 (INHS 2555, CAS 4462-4463, 12483, CNHM 18657-18658); 9 mi SW Murphysboro, 1950 (INHS 5360); Carbondale (CAS 6171-6172, SIU 448); Fountain Bluff, 1888 (SIUC R-820); Horseshoe Lake, 10 mi W Murphysboro, 1971 (FMNH 191052); Gorham Rd. 0.05 mi W of Rt. 3 intersection, 1988 (SIUC R-2070); 1 mi S Gorham, 1963 (SIUC

R-306); Rattlesnake Canyon (SIUC R-1631); Chalk Bluff, 8 mi SW Murphysboro, 1937, 1938, 1954, 1958 (SIUC R-1629, R-1630, R-90, R-197); Little Grand Canyon S. of Murphysboro, 1966 (SIUC R-1285). **Jasper County**: 3 mi W Rosehill, 1938 (INHS 1551). **Jefferson County**: Mount Vernon (Garman, 1892). **Jersey County**: Grafton, 1941 (INHS 1654, CNHM 19201). **Jo Daviess County**: MZUM 79429 (2); 1939 (INHS 1552-1555, UMMZ 79429); 5 mi N Savanna (CAS 13679); Apple River (CAS 3979-3982); Apple River bluffs between Elizabeth and Woodbine (Nickerson and Mays, 1968); Galena (CAS 4461, 7480). **Johnson County**: on road to Bald Knob, 1955 (SIUC R-111); Huckleberry Hollow (Klimstra and Hutchison, 1965). **La Salle County**: 1.7 mi W Utica, within 50 yd of Blackball Mine, 1962 (INHS 9646, H. D. Walley 838, 877); Bailey Falls (Smith, 1961). **McDonough County**: SW before 1966 (Thurow & Sliwinski, 1991). **Monroe County**: 2.5 mi N Valmeyer, 1949 (INHS 4334); 3 mi S Valmeyer, 1939 (INHS 4335); 2 mi S Valmeyer, 1949 (INHS 4336); Fults Hill Prairie Nature Preserve (Stevenson, pers. comm.). **Peoria County**: Peoria (Garman, 1892). **Perry County**: Pinckneyville, 1938 (INHS 1549); NW of Pinckneyville, 1959 (SIUC R-581). **Pike County**: 3 mi NW Pearl, 1948 (INHS 3661-3662); 3 mi W Pearl, 1951 (INHS 5832, UIMNH 50961, 52103, 41320); ESE, SW, W, NW (Thurow and Sliwinski, 1991). **Pope County**: near Lusk Creek Canyon (Robinson, 1966); near Herod (Robinson, 1966); Williams Hill Lookout Tower area, 1990 (SIUC R-2253-photo voucher); Nine-day trail ride area in the One Horse Gap Area (SE 1/4 sect 32, T11S, R7E), 1990 (SIUC R-2220); highway near Herod, T11S, R7E, sect. 9. **Pulaski County**: (Necker, 1939). **Randolph County**: Gloyd, 1940, LMK 8470-8473; (Necker, 1939). **Rock Island County**: S of Andalusia, 1945 (INHS 3704). **Saline Co.** Garden of the Gods, T10S, R7E, sect. 36. **St. Clair County**: (CNHM 56733); Falling Springs (Hurter, 1911). **Union County**: 1966 (FMNH 203996-203998, 204081); Horseshoe Bluff, 1971, 1974 (FMNH 204002, 204659); CCC Camp, Hutchins, 1935 (INHS 1406-1407, 1556);

Jonesboro, 1938 (INHS 1550, CNHM 23736); Aldredge, 1947 (INHS 2525); 3 mi NE Reynoldsville, 1957 (INHS 8790); YCC camp, sect 33, T12S,R2W, Shawnee National Forest, 1988 (SIUC R-2069, R-2293); Pine Hills area, 1957, 1965 (SIUC R-205, R-1931); Pine Hills rd. 2.15 mi N of S. gate, 1988 (SIUC R-2035); Pine Hills rd. 0.05 mi N of southern gate, 1988 (SIUC R-1971); Pine Hills, 300 yd NW of McGee Hill, 1963 (SIUC R-979); approx. 6 mi SW of Jonesboro at Luther Gibbs' place at Bluff Lake, 1966 (SIUC R-1534). **Wabash County:** (Garman, 1892).



Map 7. Known localities for the timber rattlesnake, Crotalus horridus, in Illinois. Solid circles represent localities for which voucher specimens exist, and open circles are unconfirmed literature records or sight records.

Tantilla gracilis

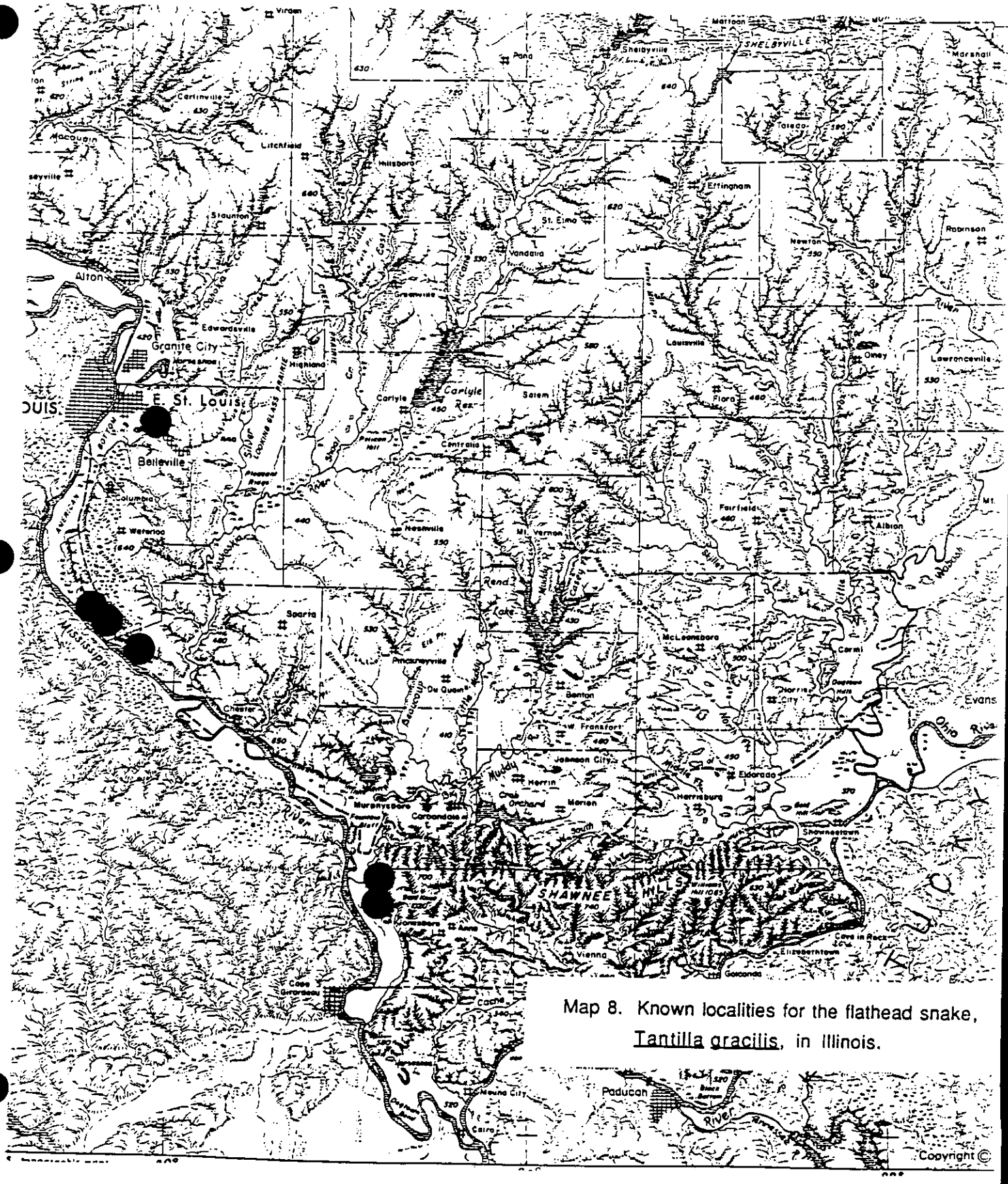
Flathead Snake

This diminutive snake, one of the state's rarest species, ranges from the Río Grande northeastward to St. Louis County, Missouri. Like the coachwhip, it has crossed the Mississippi River into the bordering bluffs of Illinois (Conant and Collins, 1991; Ernst and Barbour, 1989; and Johnson, 1987), the only place in its range where populations are found east of the Mississippi River.

The first specimen (INHS 3975) known from Illinois was collected by Smith and Burger (1950) in June 1949, 4 mi SE of Aldridge in Union County's Pine Hills area.

Populations are known to persist in the Pine Hills area of Union County (Ballard, unpublished) and in the vicinity of Fults in Monroe County, where several specimens have been taken over the years since 1949 and where we saw four individuals during 1990-1991. No additional specimens have been seen at the St. Clair and Randolph county sites.

The species presently is known in Illinois from the following localities: **Monroe County**. 1 mi S Fults (INHS 7867-7869), 2 mi S Fults (SIUC R-1229), near Fults (UIMNH 50953-50957), 1.8 mi N Kaskaskia Road on bluff road (SIUC R-2330), 2.1 mi N Kaskaskia Road on bluff road (SIUC R-2331), 0.3 mi N G Road on bluff road (this study), bluff road alongside Kidd Lake Marsh Natural Area (SIUC R-2332). **Randolph County**. Prairie du Rocher (UIMNH 50958-50959). **St. Clair County**. sight record near East St. Louis (Neill, 1951). **Union County**. 4 mi SE of Aldridge (INHS 3975), Pine Hills Recreation Area (INHS 6892-6893, 7004, 7428-7430, 7838, 8393).



Map 8. Known localities for the flathead snake, Tantilla gracilis, in Illinois.

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PART IV

HERPETOFAUNAL SURVEY

GREEN RIVER CONSERVATION AREA

AND VICINITY

AN INVENTORY OF THE AMPHIBIANS AND REPTILES OF THE LEE COUNTY - GREEN RIVER CONSERVATION AREA AND VICINITY

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INTRODUCTION

Green River Conservation Area (GRCA; also known as the Green River Wildlife Management area) is located in southwestern Lee County, Illinois, approximately 19 mi S of Dixon, and 4 mi NW of Ohio (Bureau County). Owned by the Illinois Department of Conservation, GRCA is a 2300-acre preserve managed primarily for upland game and deer hunting. GRCA lies within all or portions of six sections on the United States Geological Survey 7.5-minute Harmon (secs. 12 and 13, T 19 N, R 8 E; secs. 7 and 18, T 19 N, R 9 E) and Walton (secs. 8 and 17, T 19 N, R 9 E) quadrangles (Figures1-2). GRCA is located entirely within the Green River Lowland Natural Division (Leighton et al., 1948). Green River lies 0.6 to 1.2 mi north of the northern boundaries of the conservation area.

GRCA is composed of approximately 400 acres of woodland (principally black oak (*Quercus velutina*), maples (*Acer* spp.) and planted stands of pines (*Pinus* spp.) in upland areas; cottonwoods (*Populus deltoides*) and willows (*Salix* spp.) in wetter areas), 300 acres of crop and hay fields, 800 acres of wetlands (sloughs, ponds, marshes, and sedge meadow), and 1200 acres of grasslands and sand prairie (Figure 3). Several small to medium-sized ponds and most of the ditches held at least some water throughout this study.

Carried out between early April and mid July, 1991, this survey attempted to inventory amphibian and reptile species occurring in and around GRCA, and gather crude abundance and natural history data on each.

METHODS

Random sampling methods used throughout this survey included: search and seize, dipnetting, road cruising, listening for frog and toad vocalizations, and searches with binoculars (for basking aquatic turtles). Search and seize included turning superficial ground cover to reveal concealed animals and capturing any specimens encountered in the open or along habitat margins. Dipnets were used to collect amphibians and aquatic turtles, usually while wading a short distance into the habitat. The several paved and gravel roads in and around GRCA were driven (24-42 km/h) and searched for live or road-killed specimens. Aquatic turtles were examined through 7 X 50 Bushnell binoculars, identified, and counted as they basked at the water's surface or on emergent vegetation and debris.

Frogs and toads were observed and collected in breeding chorus. Relative frequency and numbers of species-specific breeding vocalizations were estimated at breeding sites, and assigned values based on a modification of the system suggested by Karns (1986: 48-49). Values were assigned as follows:

Value	Explanation
0	No calls heard during listening period.
1	One or two frogs heard calling; long intervals between calls.
2	Relatively frequent (some time between each call) calling by a small number (3-6) of frogs at a location during portions or all of listening period.
3	Frequent and overlapping calls by >6 frogs during the entire listening period.

Vouchers collected during this survey (preserved specimens, photographs, and cassette recordings of frog calls) were deposited in the Herpetology Collection, Department of Zoology, Southern Illinois University at Carbondale. All identifiable road-killed specimens, and small samples of live common species or those not previously reported from Lee County, were collected and preserved in 10%

formalin. Several specimen artifacts (shed skins, bone fragments, and regurgitated food items) also were collected. Live specimens of uncommon species were documented by photograph and later released where collected. In several instances, specimens temporarily maintained in captivity deposited eggs or gave birth. Data on food and reproductive habits were collected. Cassette recordings were made of the vocalizations of two species of treefrog (Hyla chrysoscelis and H. versicolor) that could not be collected or identified positively otherwise.

RESULTS

Green River Conservation Area was visited on 15 dates (April 5, 6, 7; May 3, 4, 19, 20; June 4, 5, 6, 22, 23, 29, 30; July 14) in 1991. Approximately 138 man-hours were spent in the field by as many as six persons. Approximately 400 observations or sightings of specimens (not including counts of frog and toad vocalizations) were amassed. Of these, an estimated 150 were road-killed frogs (most were unidentifiable but probably were northern leopard frogs, *Rana pipiens*) found on 23 June.

Species Accounts

Eight amphibian and 15 reptile species were observed in or near Green River Conservation Area during this survey (Table 1). The following accounts summarize field data, indicate relative abundance, and give natural history data accumulated during this survey. Approximate localities are indicated on topographical maps of GRCA and surrounding areas (Figures 4-26).

Amphibians

Eastern Tiger Salamander, *Ambystoma tigrinum tigrinum* (Figure 4). - Tiger salamander egg masses were found on 6 April in two ponds located in the southern portion of GRCA. At the first pond, located in the woodlot ca. 50 m N of the area 9 parking lot, 17 egg masses were counted along a 100-m stretch. Ten *A. tigrinum* egg masses were counted around the circumference (ca. 80 m) of a second pond just W of the area 10 parking lot (and at the SW corner of GRCA). At both locations, egg masses were estimated to contain 7-50 eggs; all masses were attached to small submerged twigs 3-6 m from shore. Three egg masses from the area 9 pond were collected on 6 April. Larvae hatched from all of them on 8 April and were raised to metamorphosis in the lab. Although no adult of this species was found during the study, Department of Conservation employees at GRCA indicated

adults commonly are seen on roads after rains, and that adults are brought to the surface during spring plowing and disking.

Eastern American Toad, *Bufo americanus americanus* (Figure 5a, b) - This was a common species during this study. Males were first heard calling on 6 and 7 April in wet portions of GRCA. Choruses continued until at least 19 May but, at that time, few males (calling value = 1) remained. By 22 and 23 June, numerous metamorphosed young-of-the-year were seen throughout GRCA. Several specimens were found dead on the roads in and around GRCA.

Blanchard's Cricket Frog, *Acris crepitans blanchardi* (Figure 6). - In recent years, this small hylid frog has suffered a dramatic decline over much of the northern portion of its range (Pentecost and Vogt, 1976; Vogt, 1981; Mierzwa, 1989). In Wisconsin, it has been recognized as a state endangered species since 1982 (Allen, 1988). Although Smith (1961:79) called this species "...the most common amphibian in Illinois,..." and showed many records from northern Illinois, extant populations of *Acris crepitans* now occur only at widely scattered localities in Boone, Carroll, LaSalle, Lee, and Will counties. The Lee County population may be restricted to GRCA, up to 12 individuals were heard calling at the area 9 pond and the Atkinson Road Marsh, just S of the area 11 parking lot entrance. The choruses at both localities began just after dark on 5 and 23 June, in the centers of both bodies of water. In larger choruses I have observed in southern Illinois (where the species remains common) and in Will County calling individuals were spaced evenly within a few meters of the waters edge. Other suitable-looking marshes in Lee County (one complex is ca. 4 km W of GRCA, near County Line Road, the other ca. 5 km sS of Amboy) lacked cricket frogs on 23 June. Specimens from the GRCA population were not collected, but a voucher cassette recording was made on 23 June. Because this may be the only population remaining in Lee County, periodic calling censuses should be carried out to monitor its continuing existence.

Cope's Gray Treefrog, *Hyla chrysoscelis* (Figure 7a, b). - This species is the diploid member of a cryptic pair of sibling species that also includes the tetrapoid eastern gray treefrog, *Hyla versicolor*. Accurate identification of these species is impossible from morphological characters alone but they can be distinguished by differences in chromosome number and by differences in breeding call (Johnson, 1966; Ralin, 1968; Brown and Brown, 1972). At the time of Smith (1961), these were not recognized as different species. The only paper to treat both species in Illinois is by Brown and Brown (1972). Neither species has been reported previously from Lee County, although the gray treefrog population at Nachusa Grasslands (ca. 6.0 km NW of Franklin Grove), found in 1988, is identifiable as *Hyla chrysoscelis*.

A large population of gray treefrogs was located at GRCA during this study, and is tentatively identified as *H. chrysoscelis* because of its fast, long-trilled breeding call. Breeding calls of the treefrogs at GRCA were recorded, and a voucher specimen was collected for future verification. At GRCA, gray treefrogs were first heard calling on 19 and 20 May; at that time three large choruses (call value = 3) were located at the Atkinson Road Marsh, the area 9 pond, and the willow/cottonwood swamp along Union Road just E of area 1. On 5 June, Ron Brandon, Mark Bavetz, Robert Flick, and I heard individuals calling scattered throughout most of the wet areas in GRCA, but no large choruses were apparent.

Western Chorus Frog, *Pseudacris triseriata* (Figure 8a, b). - This small, terrestrial hylid frog usually is the first species heard in early spring. On 4 and 5 April, large choruses were heard throughout the wet areas of GRCA. In the slough immediately north of the Game Road check station, calling male western chorus frogs were separated by only one to two meters, and I estimated >50 individuals in the chorus. Calling male frogs were conspicuous on tops of floating mats of aquatic vegetation and dead clumps of Reed Canary Grass. Males called at

GRCA until at least 5 June. Two egg masses of this species found on 6 April in a flooded field east of Pump Factory Road and N of the area 4 parking lot were estimated to contain 40-50 eggs each.

Bullfrog, *Rana catesbeiana* (Figure 9a, b). - This large, highly aquatic frog was not observed at GRCA until 20 May, when one individual was heard calling in the Atkinson Road Marsh. On 5 June, 6-12 bullfrogs were heard calling at the area 9 pond, and six more were heard at the Atkinson Road Marsh. This species was not heard calling in the flowing ditches or sloughs, but a live juvenile specimen was collected on Atkinson Road at the culvert connecting the slough with the farmland to the west on 23 June. On 30 June, a dead specimen was collected on Maytown Road near the SE corner of GRCA. Although moderately common at GRCA, this species may not occur in the numbers that it does in the Chicago area, where mowed grass shorelines and a general absence of emergent aquatic vegetation are believed to have contributed to the decline of smaller species, and been favorable to expansion and growth of bullfrog populations (Ludwig, et al., 1990).

Green Frog, *Rana clamitans melanota* (Figure 10a, b). - This frog was moderately common in most permanent bodies of water at GRCA. Individuals were seen or collected in a ditch along Maytown Road, which held water on 6 April, and in the ponds at areas 9 and 10. Males were calling by 19 May. On 5 June, many individuals (calling value = 2-3) were heard calling in the Atkinson Road Marsh and in the area 9 pond. Several others were heard calling sporadically (calling value = 1) at the Game Road Slough, just N of the GRCA check station. One dead specimen was collected on Atkinson Road on 30 June and several large, unidentifiable frogs, probably either green frogs or bullfrogs, were found DOR then as well.

Northern Leopard Frog, *Rana pipiens* (Figure 11a, b). - This was the most commonly encountered amphibian during this survey. On 4 and 5 April,

numerous males were heard calling (value = 2) in flooded fields at areas 3, 4, 5, and 8, in the area 9 pond, and in the Game Road Slough just north of the Hunter check station. Also on 4 April, live *Rana pipiens* were collected on Maytown Road, at area 8, and on Atkinson Road at the area 11 entrance; other live individuals were seen at or near these locations after that date, but were not collected. Until 23 June, adult specimens were found sporadically throughout many of the grassy areas of GRCA. On the morning of 23 June, 19 small DOR juveniles were collected on Maytown Road between Game Road and the area 9 entrance. At least 150 unidentifiable DOR specimens, most apparently of this species, were counted on the same stretch of road. Twenty-seven live juveniles were found in tall grass just off the shoulder of Maytown Road. No juvenile northern leopard frog was noted on 22 June. The large number seen on 23 June may have represented postmetamophic dispersal of juveniles from the breeding ponds.

Reptiles

Common Snapping Turtle, *Chelydra serpentina* (Figure 12a, b). - This is a large, highly aquatic turtle that is sometimes difficult to observe. Prior to this survey, no literature record of this species existed for Lee County. On 19 May, a subadult specimen was collected along the W edge of the Atkinson Road Marsh. On 23 June another subadult was collected DOR on Route 26, approximately 1.1 km N of Union Road, at the Green River roadside table. The species inhabits a wide variety of aquatic habitats, and despite the low number collected, it probably is abundant throughout the GRCA and surrounding areas.

Painted Turtle, *Chrysemys picta* ssp.(Figure 13a, b). - The painted turtles of GRCA appear to be intergrades between the subspecies *Chrysemys picta marginata* (Midland Painted Turtle), and *C. picta bellii* (Western Painted Turtle). During this study, painted turtles were observed basking on floating debris in the

Atkinson Road Marsh (six seen on 20 May) and in the area 9 pond (two seen on 6 June). Three DOR painted turtles were collected on Route 26 as follows: one approximately 300 m S of Union Road intersection, 19 May; one approximately 0.9 km N of Maytown Rd. intersection, near homesite, 20 May; one 1.1 km N of Union Road intersection at the Green River roadside table, 30 June.

Blanding's Turtle, *Emydoidea blandingii* (Figure 14). - Prior to this study, only two records of this uncommon turtle were known for Lee County, both of them unpublished. Moll (1985) reported one to the Department of Conservation in1985, and Kenneth Mierzwa (pers. comm.) found one in Nachusa Grasslands in 1988. During this study, a subadult Blanding's turtle was captured in the Atkinson Road Marsh on 14 July. In northern Illinois, this species occurs in quiet aquatic habitats such as cattail marshes, sloughs, weedy river backwaters and ponds, as well as surrounding wet and wet-mesic sedge meadows (Smith, 1961; Ludwig, et al., 1990; Rose and Moll, 1991). This is a very secretive species, and is difficult to observe in numbers, even where it is fairly common. The extensive slough and marsh habitats, and nearby sedge meadows found at GRCA appear to offer ideal habitat for the Blanding's turtle.

Ornate Box Turtle, *Terrapene ornata ornata* (Figure 15a, b). - Northwestern Illinois (including Lee County) and SW Wisconsin are at the northeastern limit of this species' range. Primarily distributed in the Great Plains, the ornate box turtle is adapted to arid short grass prairie and sand prairie. The rolling sandy-loam hills and dunes at GRCA offer ideal habitat for this species. During this study, three live ornate box turtles were captured. Two were found AOR (one on Pump Factory Road between areas 5 and 6 on 4 June; one on Union Road approximately 100 m W of the area 1 entrance on 6 June;), and one was found in a sand area 0.5 km NE of the area 12 parking lot. The remains of another were found near the trash pile on the N boundary of GRCA approximately

250 m NW of the area 2 parking lot. Several Department of Conservation personnel have reported that this species is common at GRCA. Bern Kean (pers. comm.), an amateur herpetologist from Chicago, who has bow hunted at GRCA for 18 years, has found several dead ornate box turtles in the autumn that apparently were shot by hunters.

Spiney Softshell Turtle, *Apalone spinifera* ssp. (Figure 16). - This species has not been reported previously from Lee County. A specimen was collected in the Green River, below the Route 26 bridge on 4 May. This species occurs in rivers and small creeks, and may be common in rivers that are heavily disturbed or channelized (Moll, 1980; Ludwig, et al., 1990; M. Redmer, pers. obs.). The species probably does not occur in large numbers in the sloughs and marshes of GRCA, but may be common in nearby Green River.

Prairie Racerunner, *Cnemidophorus sexlineatus viridis* (Figure 17a, b). - This was the most commonly observed reptile of this survey, with 56 recorded sightings. Most individuals were seen in sandy areas near shrubby patches or treelines. Although this is a conspicuous species, it is difficult to collect because of its running speed and burrows. On three occasions individuals were observed running or basking on roads.

Blue Racer, *Coluber constrictor foxii* (Figure 18). - Although Smith (1961) had questioned the validity of this subspecies and identified racers in the northern four-fifths of Illinois as *C. c. flaviventris*, Conant and Collins (1991) recently have continued to recognize *Coluber constrictor foxii* for racers of the Prairie Peninsula. During this survey only one racer, a juvenile, was seen. Although the species occurs commonly at other sand areas in northern Illinois, it has not been reported previously from Lee County. Some authors have reported that the racer is sensitive to pesticides because it is partially isectivourous

(Minton, 1972; Pentacost and Vogt, 1976). In Lee County, extensive cultivation and related pesticide use may limit this species to large preserves .

Western Fox Snake, *Elaphe vulpina vulpina* (Figure 19a, b). - Three fox snakes were found at GRCA and vicinity during this study. One live subadult (estimated 55 cm long) was caught and released on 22 June in a large trash pile on the N boundary of GRCA, approximately 250 m NW of the area 2 parking lot. Two DOR specimens were collected during this study, one on Maytown Road 100 m Eof the Pump Factory Road intersection, and another on Pump Factory Road between the area 4 and 5 parking lots (20 May and 29 June, respectively). This species is likely found throughout GRCA in grassy fields, sedge meadows, along fence rows and the edges of wooded areas.

Western Hognose Snake, *Heterodon nasicus* ssp. (Figure 20). - In Illinois, this snake is limited to isolated sand areas along the Illinois, Mississippi, Green, and Rock Rivers (Smith, 1957, 1961) and perhaps to a hill prairie in Monroe County (Moll, 1962). It is considered a threatened species in Illinois (Morris and Smith, 1981). During this study, one live specimen (a female ca. 40 cm long) was caught in one of a series of sand blows approximately 500 m NE of the area 12 parking lot, on 6 June. This specimen was maintained in captivity to be photographed, then released. While in capitivity, it deposited six eggs (four on 21 June, two on 25 June). Shortly after capture, it regurgitated four egg shells, probably of the ornate box turtle. Previously, Barten (1980) and Murphy and Dloogatch (1980) had reported egg-eating behavior in this species in Whiteside County, Illinois. Platt (1969) reported that the diet of this species consists primarily of rodents, frogs, toads, lizards, other snakes and reptile eggs. The Lee County animal was offered, but refused, young mice, but did attempt to eat a smooth green snake; on 1 July it was offered a small (ca. 40 cm long) plains garter snake from GRCA. The garter snake was seized immediately and swallowed within 5

minutes. Several photographs of this snake and shed skins obtained from this specimen and another cast in the wild were kept as vouchers. The GRCA specimen collected on 6 June was released on 14 July where captured. One western hognose snake (Illinois Natural History Survey 7353) was collected in 1929 at "Amboy." M. A. Morris (pers. comm.), R. Nyboer (pers. comm.), and Bern Kean (pers. comm.) all have seen this species at GRCA.

Eastern Hognose Snake, *Heterodon platirhinos* (Figure 21). - On 20 May, between 1850 and 1925 h, two eastern hognose snakes were caught near the area 2 parking lot. The first one, a female ca. 90 cm long, was found basking on the W-facing hillside about 50 m NW of the parking lot. The second one, another female and about 110 cm long, was crawling across the sand road leading into area 1, directly across Pump Factory Road from the area 2 entrance. Both specimens appeared to be gravid and displayed the bluffing and death feigning behavior for which the genus is noted. Smith (1961) recorded this species from Lee County in the Green River Lowlands; his photograph is of a Lee County specimen. Some herpetologists are concerned about the status of this species in Illinois. It apparently has undergone a dramatic decline since the early 1960's, perhaps due to widespread use of pesticides and/or habitat destruction. The species occurs in sandy or loose soils where burrowing is easy. Its primary food, toads and frogs, is abundant at GRCA. Department of Conservation personnel at GRCA indicated they commonly encounter this species. In 18 years of hunting at GRCA, Bern Kean (pers. comm.) has encountered 12 eastern hognose snakes.

Northern Water Snake, *Nerodia sipedon sipedon* (Figure 22). - Two specimens were seen and identifiable by their distinctive banding pattern. The first one was seen on 6 April in the ditch that crosses under Game Road and Maytown Road in the SC side of GRCA. It was observed basking in matted grass along the flowing water present in the ditch at that time, but it escaped into the water.

The second one was observed on 19 May in the flowing water of the Atkinson Road Slough, swimming approximately 10 m from the road, on the E side of the culvert. In northern Illinois, this species is most common in rivers of all sizes, and in nearby wetlands. It probably is common in Green River and the GRCA, but is more difficult to observe at GRCA because of the lush sedge and cattail growth throughout most of the wetlands. This species was not known from Lee County until 1987, when it was first found at Nachusa Grasslands; another was seen there during this survey. In 1990, one was caught and released by T. Anton and me at nearby Franklin Creek State Park.

Smooth Green Snake, *Opheodrys vernalis* (Figure 23). - One specimen of this small snake was collected at GRCA during this survey. It was found on the area 2 sand road, approximately 0.5 km W of Pump Factory Road on 20 May. The smooth green snake has not been recorded from Lee County previously, although Department of Conservation personnel at GRCA indicated that the species is commonly seen there. The extensive grasslands, and wet-mesic and mesic sedge meadows at GRCA offer ideal habitat for this species and a healthy population probably occurs there.

Midland Brown Snake (Dekay's Snake), *Storeria dekayi wrightorum* (Figure 24). - Two were caught on Maytown Road on 29 June. This relatively secretive species was not known from Lee County before 1988 when it was collected at Nachusa Grasslands. Another was found in 1991 at Franklin Creek State Park. The midland brown snake probably is fairly common in and around savannas and other wooded areas throughout Lee County.

Eastern Plains Garter Snake, *Thamnophis radix radix* (Figure 25a, b). - Seven specimens were found at GRCA during this survey, all on roads. Four were caught on 6 April as they and eastern garter snakes apparently were emerging from hibernation. Smith (1961:230) considered the eastern plains garter snake

to be ..."extermely abundant in certain muck prairie areas in the northern half of Illinois and it seems to thrive in the most heavily cultivated districts,..." The peripheries of the extensive slough and marsh habitats, and large grassy fields at GRCA might support a large population of this species, but lack of ground cover in these areas makes sampling difficult.

Eastern Garter Snake, *Thamnophis sirtalis sirtalis* (Figure 26a, b). - Six live specimens were caught on roads at GRCA, on 6 April, probably as they were emerging from hibernation. Two others were found on roads during the survey, on 6 and 29 June. Only one was found under ground cover. Although the eastern garter snake probably is common throughout Lee County, it has not been reported from the county previously.

Species of Possible Occurrence

Eighteen additional species, 6 amphibians and 12 reptiles, not yet found at GRCA are known from similar habitats elsewhere in NW Illinois or have been reported nearby (Table 2). These might occur at GRCA, and each is discussed below.

Amphibians

Central Newt, *Notophthalmus viridescens louisianensis.* - One Lee County specimen (INHS 5586), was collected at Amboy in 1950. Populations might be found in and around the several woodland ponds at GRCA, which appear to be suitable habitat.

Mudpuppy, *Necturus maculosus.* - This species was recorded from Lee County by Pope (1944; cited by Smith, 1961) from Sublette. Apparently, the specimen was taken from a tributary of Green River. Green River, near GRCA, and its tributaries might still provide suitable habitat.

Fowler's Toad, *Bufo woodhousei fowleri*. - This toad is abundant in the sand areas along the Illinois and Mississippi rivers, but records are lacking from NW Illinois N of Mercer and Bureau counties (Smith, 1961). The Bureau County specimen from near Princeton is the nearest to Lee County.

Illinois Chorus Frog, *Pseudacris streckeri illinoensis*. - This state threatened species has a relictual distribution in sand areas along the Illinois and Mississippi river valleys (Smith, 1961; Brown and Rose, 1988). Apparently suitable habitat exists in and around GRCA, but the nearest known locality is in Tazwell County, some 90 miles to the south.

Eastern Gray Treefrog, *Hyla versicolor*. - Although all the gray treefrogs heard at GRCA during this survey appeared to be *Hyla chrysoscelis*, the morphologically indistinguishable *H. versicolor* may in the future be shown to occur there as well. The relative ranges of these two cryptic species in Illinois remain poorly understood, and they are known to be sympatric in some other parts of the state. Brown and Brown (1972) reported *H. versicolor* from as near as Putnam County.

Plains Leopard Frog, *Rana blairi*. - This frog occurs throughout central Illinois (Brown and Morris, 1990). Brown and Morris questioned the validity of locality data of a specimen purportedly collected in Lee County. Their nearest verified records were from WC and NE La Salle County. If verified, Lee County would represent the NW-most extent of the range in Illinois.

Reptiles

Illinois Mud Turtle, *Kinosternon flavescens spooneri*. - This Illinois endangered species is known from two localities in SW Lee County, where small wetlands scattered throughout the sandy soils provide suitable habitat. One is from 4 miles N of Ohio (collected in 1971), and the other from the farm of Mr. Eugene

Kaeker, 2.5 miles W of GRCA (captured in 1985), near the Whiteside County line (Brown and Moll, 1979; Moll, 1985). This species may be found to occur at GRCA.

Stinkpot, *Sternotherus odoratus*. - Smith (1961:124) expressed the opinion that "The stinkpot undoubtedly occurs in every Illinois county..." although "Usually special efforts must be made to find this turtle..." Although not yet seen there, this turtle probably occurs in the sloughs and marshes of GRCA and in back-water habitats along Green River itself. The nearest known localities are in Winnebago County to the north, Putnam County to the south, and extreme NW Whiteside County (Redmer notes).

Common Map Turtle, *Graptemys geographica*, and **False Map Turtle**, *Graptemys pseudogeographica* complex. - These primarily are known from river habitats. Cahn (1937) reported *G. geographica* from Henry, Rock Island, and Whiteside counties. R. Humbert (pers. comm.) recently collected *G. pseudogeographica* in the Mississippi River in Whiteside County. Both of these species may be found to occur in Green River.

Red-eared Slider, *Trachemys scripta elegans*. - This large basking turtle was reported from Rock Island and Whiteside counties by Cahn (1937). Although Lee County is at or near the NW edge of the range of this species, a population might be found to occur in the wetlands of GRCA and vicinity.

Smooth Softshell Turtle, *Apalone mutica*. - Smith (1961) reported this species from Carroll and Whiteside counties, and stated (1961:155) that "The smooth softshell is evidently restricted to rivers with relatively clean, sandy bottoms and with frequent sand bars." Johnson (1987) and Moll (1980) suspected that this species had disappeared over much of the Midwest where rivers have been polluted, channelized, or silted in. Green River formerly may have

offered suitable habitat for this species, but it has been channelized, and near GRCA it is very turbid. That it may still occur there is possible but unlikely.

Western Slender Glass Lizard, *Ophisaurus attenuatus attenuatus*. - Both M. A. Morris (pers. comm.) and Bern Kean (pers. comm.) have seen this species at GRCA. The specimen seen by Kern apparently had been killed by a mower or other heavy equipment, and was not retained. This lizard is known to occur in sand prairies and, thus, probably occurs elsewhere in Lee County as well. The nearest known localities are in Grundy, Stark, and Will counties.

Eastern Milk Snake, *Lampropeltis triangulum triangulum*. - Although there are few records of this snake from NW Illinois and none from Lee County, it has been found elsewhere around small to large tracts of savanna, an extensive habitat at GRCA and other parts of Lee County. It probably will be found to occur there.

Bullsnake, *Pituophis melanoleucus sayi*. - In Illinois, this constrictor is most widely distributed and common in and around sand prairies in central and NW parts of the state. It was not seen at GRCA and there are no records from Lee County. Neither Bern Kean, who has hunted and scouted in GRCA for 18 years, nor Department of Conservation personnel report having seen this usually conspicuous snake in the area. However, there appears to be much suitable habitat, and it has been reported from Ogle County to the north, and Whiteside County to the west.

Graham's Crayfish Snake, *Regina grahamii*. - This crayfish-eating snake is distributed widely over much of the state, where it occurs in sluggish water habitats such as lakes, river-bottom sloughs, and prairie marshes (Smith, 1961). Much suitable habitat appears to exist at GRCA.

Western Ribbon Snake, *Thamnophis proximus proximus*. - Several preserved specimens, collected at Sublette, are deposited in the Field Museum of Natural History. In 1990, I observed but could not catch a ribbon snake at

Franklin Creek State Park; another may have been seen at Nachusa Grasslands in 1988. Much apparently suitable habitat exists at GRCA and elsewhere in Lee County.

Eastern Massasauga, *Sistrurus catenatus catenatus*. - Although not yet reported from NW Illinois (nearest locality is in De Kalb County), this small rattlesnake usually is secretive in and around sloughs, river bottoms, and adjacent wet prairies. It does not fare well in the vicinity of human beings. Because of the extent of its wetland habitats, GRCA probably should be considered a possible but unlikely locality for the massasauga.

DISCUSSION

Although the available grassland and sand prairie habitats are extensive in the Green River Conservation Area, only 7 of the 22 species (31.8%) found during this survey would be considered specialists in these habitats. Of these seven species, only three (ornate box turtle, prairie racerunner, and western hognose snake) seem to be restricted to sand areas and their immediate surrounding habitats in northern Illinois. Likewise, only four of the additional 18 species (22.2%) that might eventually be found to occur at GRCA would be considered sand prairie specialists (Illinois chorus frog, western slender glass lizard, Illinois mud turtle, and bullsnake).

Nine species (40.9%) found at GRCA during this survey (Blanchard's cricket frog, bullfrog, green frog, northern leopard frog, common snapping turtle, painted turtle, Blanding's turtle, spiny softshell turtle, and northern water snake) would be considered widespread aquatic or semiaquatic species. Of these, the northern leopard frog and Blanding's turtle are known to wander far from aquatic habitats. Ten of the additional 18 species that might occur at GRCA also are primarily aquatic.

Six species (27.7%) found at GRCA during this survey (eastern tiger salamander, American toad, western chorus frog, eastern hognose snake, Dekay's snake, and eastern garter snake) would be considered habitat generalists. In northern Illinois, all of these occur in several habitat types. While the three species of amphibians have aquatic larval stages, transformed subadults and adults disperse widely from breeding habitats during most of the year. While it seems to prefer open, sandy habitat, the eastern hognose snake also occurs in woodlands and other habitats. Of the species of possible occurrence at GRCA, only the eastern milk snake and, perhaps, Fowler's toad are habitat generalists, although the former seems most common around savannas and woodlots. Gray treefrogs breed in

ponds or other bodies of water but by day are more likely found in dense shrub thickets and woods.

Of the 41 species collectively covered in this report, three (western hognose snake, Illinois mud turtle, and Illinois chorus frog) are listed as endangered or threatened by the Illinois Department of Conservation. Additionally, eight species (Blanchard's cricket frog, Blanding's turtle, eastern hognose snake, smooth green snake, mudpuppy, smooth softshell turtle, Graham's crayfish snake, and eastern massasauga) are considered by some herpetologists to have undergone dramatic declines over all or significant parts of Illinois.

Because of its relatively large area, diversity of habitats, relatively undisturbed character, and known or suspected species diversity, Green River Conservation Area seems to offer a valuable refuge for amphibians and reptiles of Lee County in particular and NW Illinois in general.

ACKNOWLEDGMENTS

I thank several individuals for offering their field observations on the amphibians and reptiles of Lee County, including: Bearnie Kean, Randy Nyboer, of the Illinois Department of Conservation, Division of Natural Heritage, and Dr. Michael A. Morris, of Wood River. Several Department of Conservation employees at Green River Conservation Area told me of their herpetofaunal observations and suggested likely portions of the preserve for field work. Mark Bavetz and Robert Flick, SIU at Carbondale Department of Zoology, accompanied me in the field on 4 and 5 June. Bearnie, Brian, and Jerry Kean, Dan Prohorenia, and Primitivo Suarez assisted with field work on 23 June. Kenneth Mierzwa provided the catalogue numbers of several museum specimens cited in this text. Finally, I thank Dr. Ron Brandon for advice, assistance, and encouragement throughout this study.

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Table 1. Checklist of amphibian and reptile species found at Green River Conservation Area and vicinity during the 1991 inventory.

Common Name	Scientific Name
Amphibians	Class Amphibia
Salamanders	Order Caudata
Eastern tiger salamander	*Ambystoma tigrinum tigrinum*
Frogs and Toads	Order Anura
Eastern American toad	*Bufo americanus americanus*
Blanchard's cricket frog	*Acris crepitans blanchardi*
Cope's gray treefrog	*Hyla chrysoscelis*
Western chorus frog	*Pseudacris triseriata*
Bullfrog	*Rana catesbeiana*
Green frog	*Rana clamitans melanota*
Northern leopard frog	*Rana pipiens*
Reptiles	Class Reptilia
Turtles	Order Testudines
Common snapping turtle	*Chelydra serpentina*
Painted turtle	*Chrysemys picta* ssp.
Blanding's turtle	*Emydoidea blandingii*
Ornate box turtle	*Terrapene ornata*
Spiny softshell turtle	*Apalone spinifera* ssp.
Lizards	Suborder Lacertilia
Prairie racerunner	*Cnemidophorus sexlineatus viridis*
Snakes	Suborder Serpentes
Blue racer	*Coluber constrictor foxii*
Western fox snake	*Elaphe vulpina vulpina*
Western hognose snake	*Heterodon nasicus* ssp.
Eastern hognose snake	*Heterodon platirhinos*
Northern water snake	*Nerodia sipedon sipedon*
Smooth green snake	*Opheodrys vernalis*
DeKay's snake	*Storeria dekayi wrightorum*
Eastern plains garter snake	*Thamnophis radix radix*
Eastern garter snake	*Thamnophis sirtalis sirtalis*

Table 2. Checklist of amphibian and reptile species not found at Green River Conservation Area and vicinity during the 1991 inventory, but that may be found to occur there.

Common Name	Scientific Name
Amphibians	Class Amphibia
Salamanders	Order Caudata
Central newt	*Notophthalmus viridescens louisianensis*
Mudpuppy	*Necturus maculosus*
Frogs and Toads	Order Anura
Fowler's toad	*Bufo woodhousei fowleri*
Illinois chorus frog	*Pseudacris streckeri illinoensis*
Eastern gray treefrog	*Hyla versicolor*
Plains leopard frog	*Rana blairi*
Reptiles	Class Reptilia
Turtles	Order Testudines
Illinois mud turtle	*Kinosternon flavescens spooneri*
Stinkpot	*Sternotherus odoratus*
Common map turtle	*Graptemys geographica*
False map turtle	*Graptemys pseudogeographica*
Red-eared slider	*Trachemys scripta elegans*
Smooth softshell turtle	*Apalone mutica*
Lizards	Suborder Lacertilia
Western slender glass lizard	*Ophisaurus attenuatus attenuatus*
Snakes	Suborder Serpentes
Eastern milk snake	*Lampropeltis triangulum triangulum*
Bullsnake	*Pituophis melanoleucus sayi*
Grahan's crayfish snake	*Regina grahamii*
Western ribbon snake	*Thamnophis proximus proximus*
Eastern massasauga	*Sistrurus catenatus catenatus*

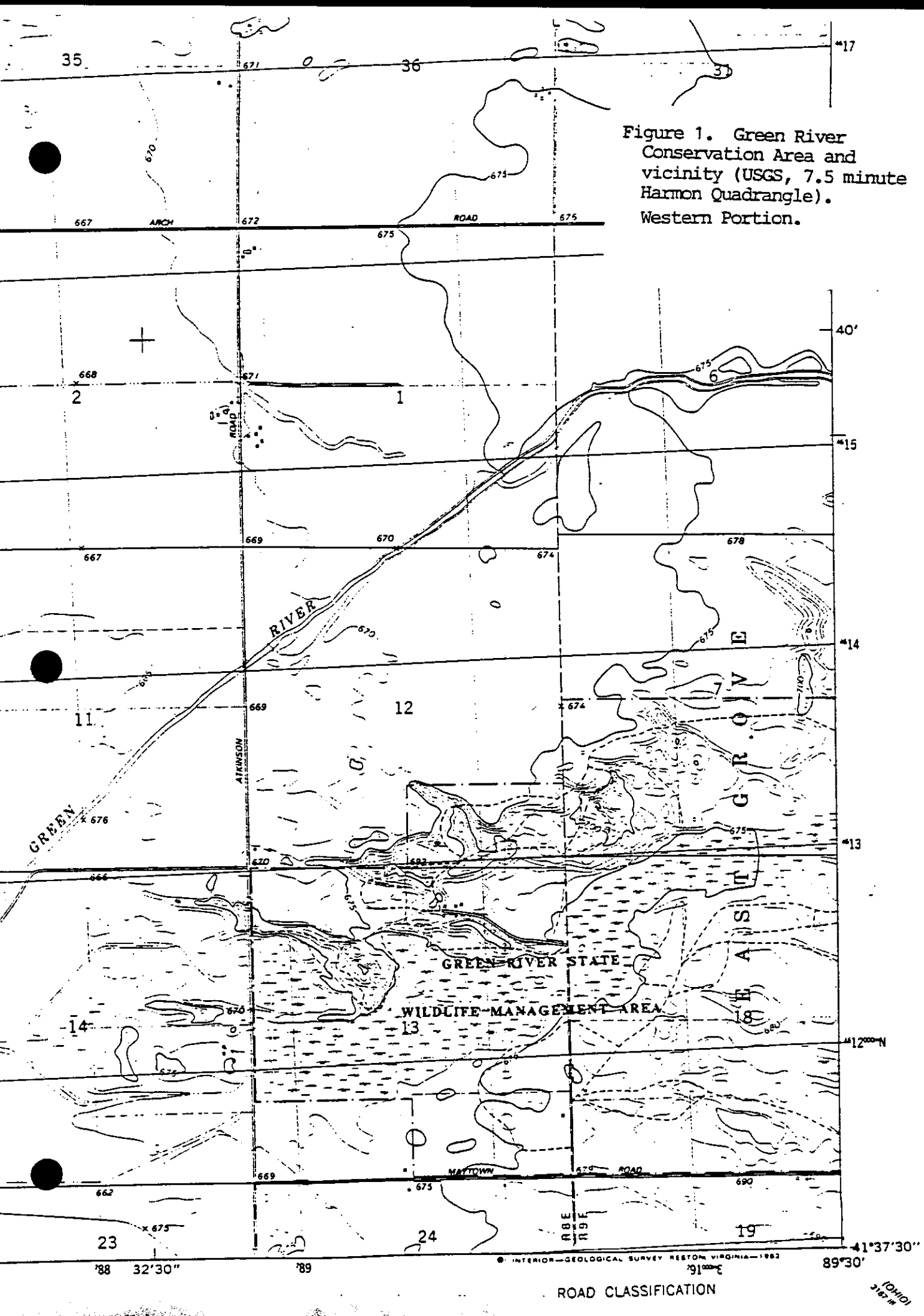


Figure 1. Green River Conservation Area and vicinity (USGS, 7.5 minute Harmon Quadrangle). Western Portion.

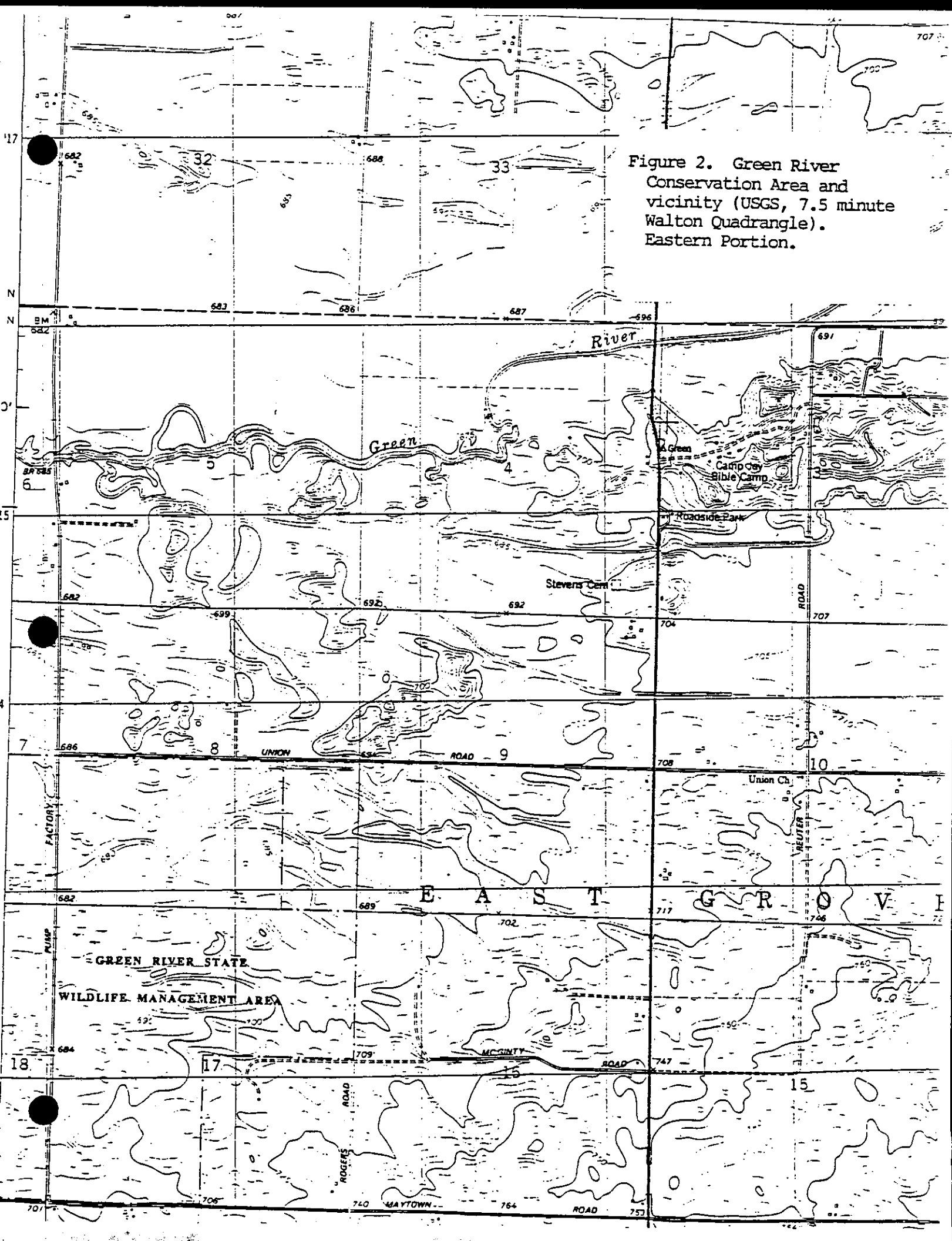
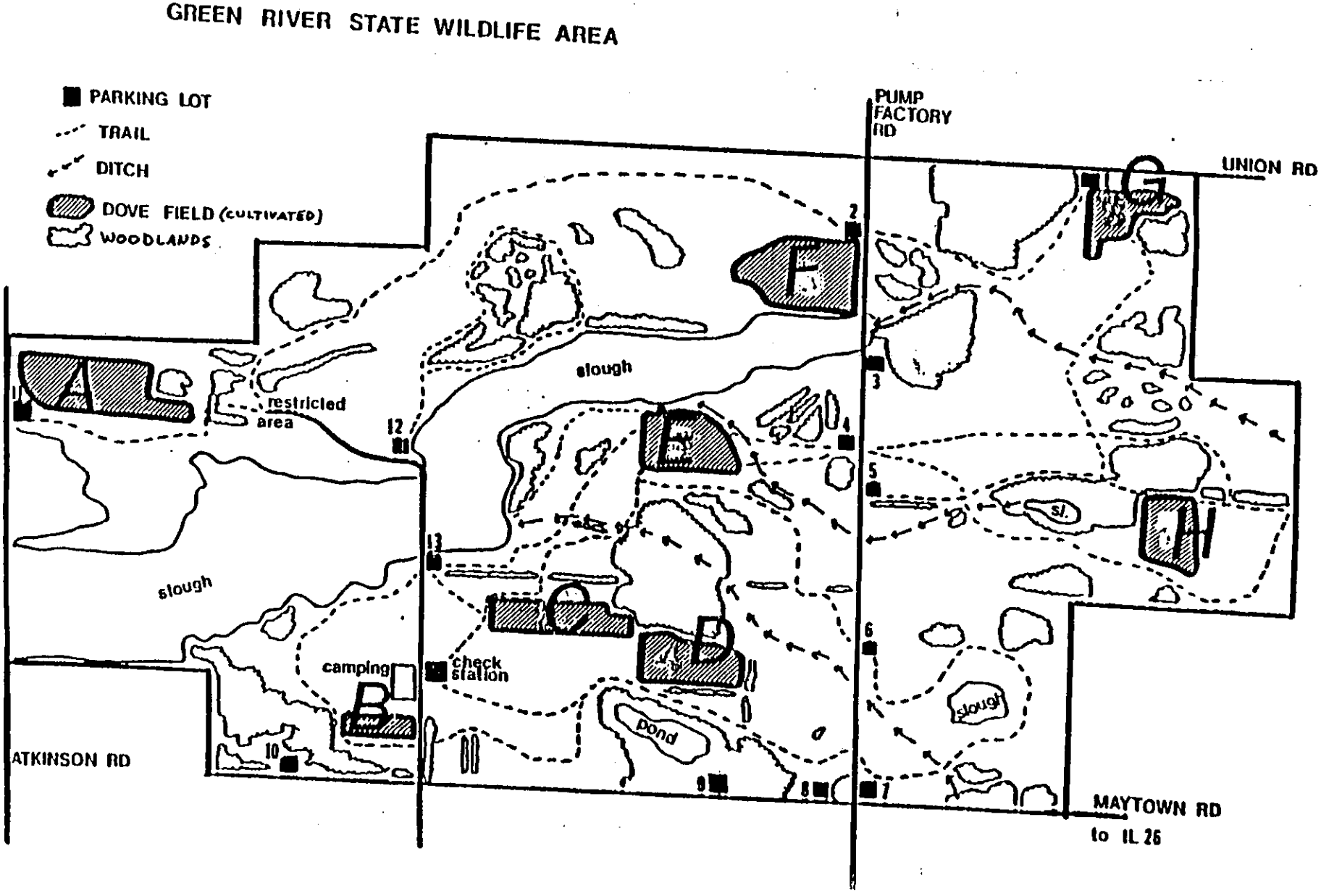


Figure 2. Green River Conservation Area and vicinity (USGS, 7.5 minute Walton Quadrangle). Eastern Portion.

Figure 3. Visitor information map of GRCA, showing rough vegetation types, controlled hunting areas, and cultivated fields.



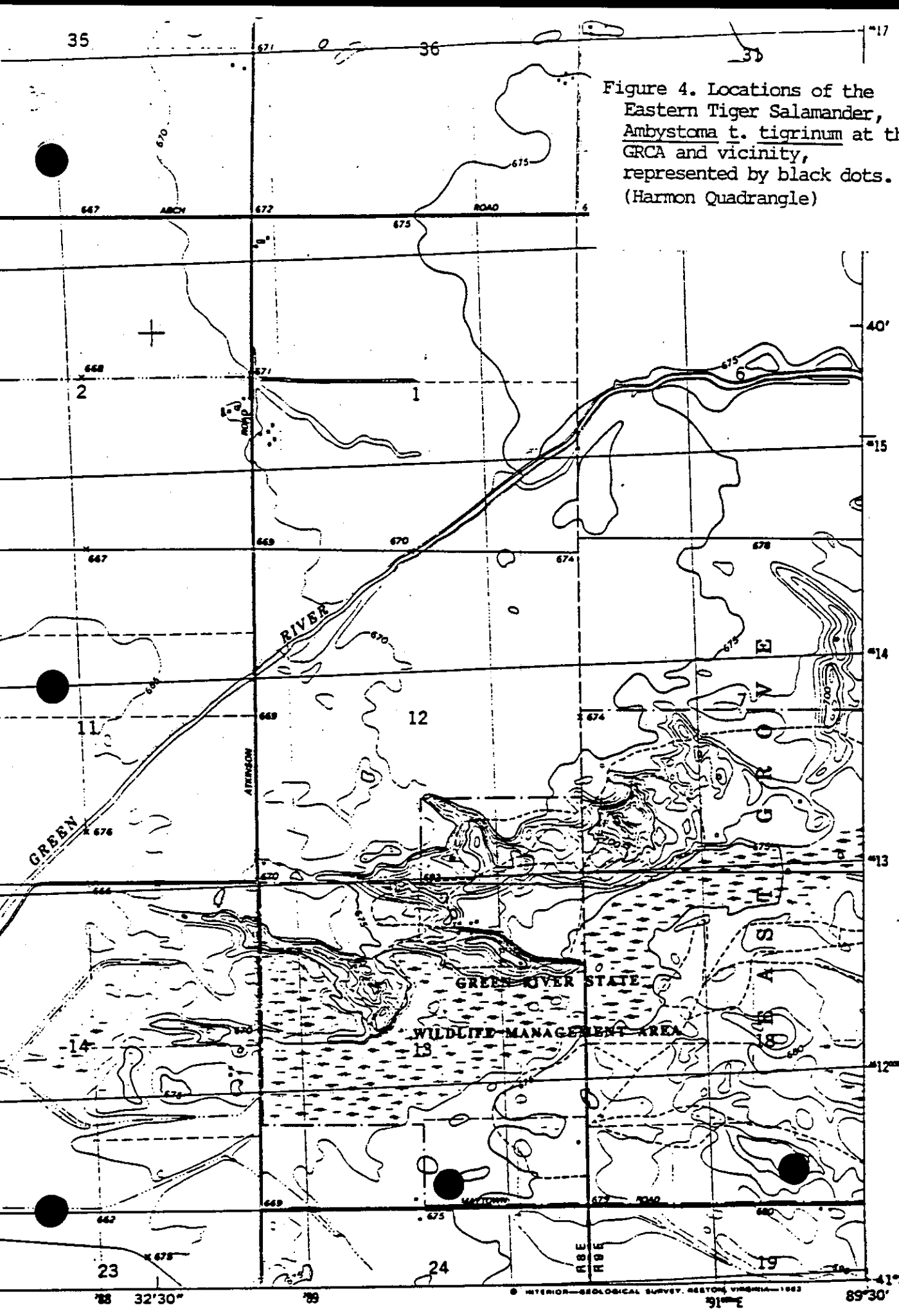


Figure 4. Locations of the Eastern Tiger Salamander, Ambystoma t. tigrinum at the GRCA and vicinity, represented by black dots. (Harmon Quadrangle)

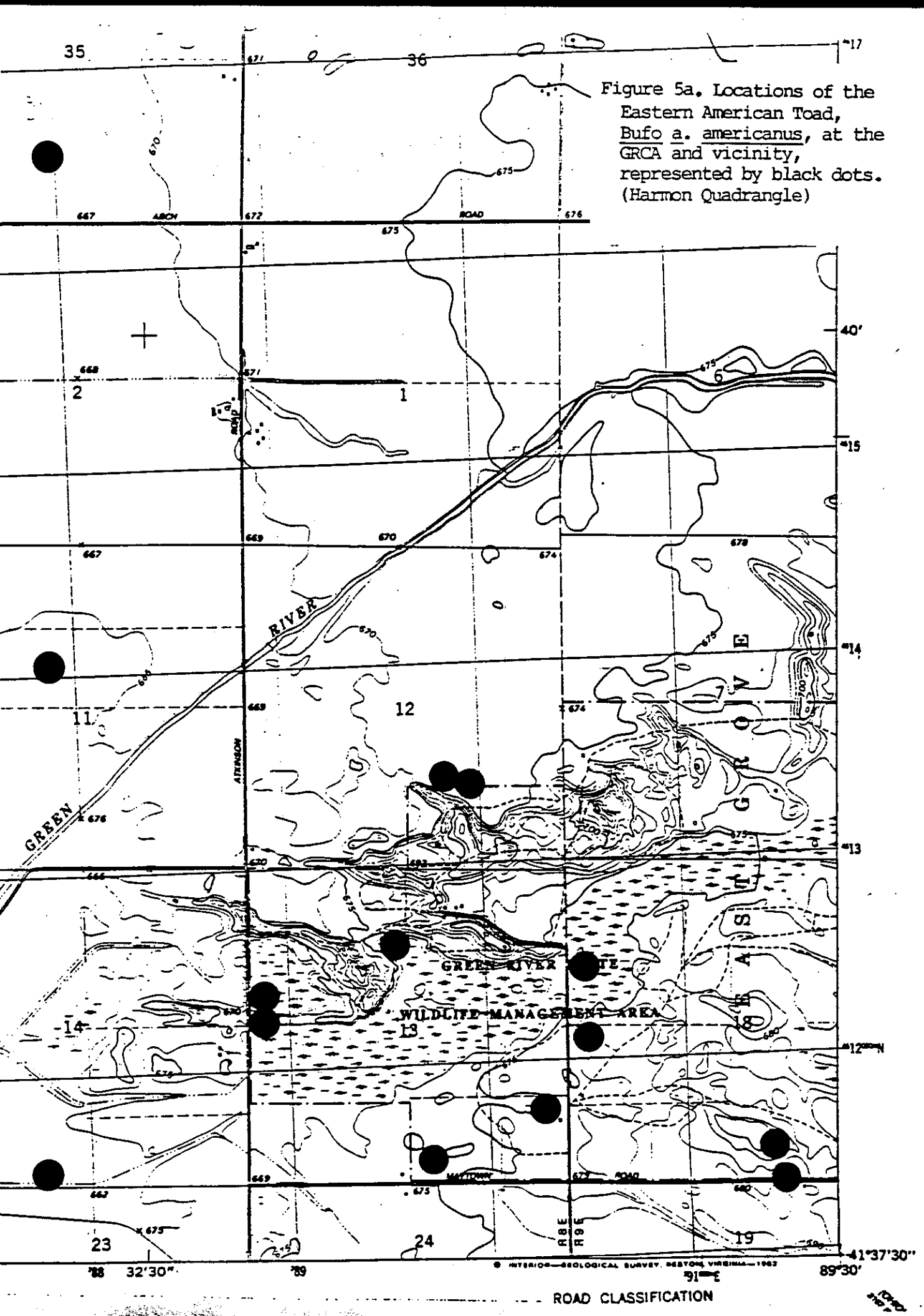


Figure 5a. Locations of the Eastern American Toad, Bufo a. americanus, at the GRCA and vicinity, represented by black dots. (Harmon Quadrangle)

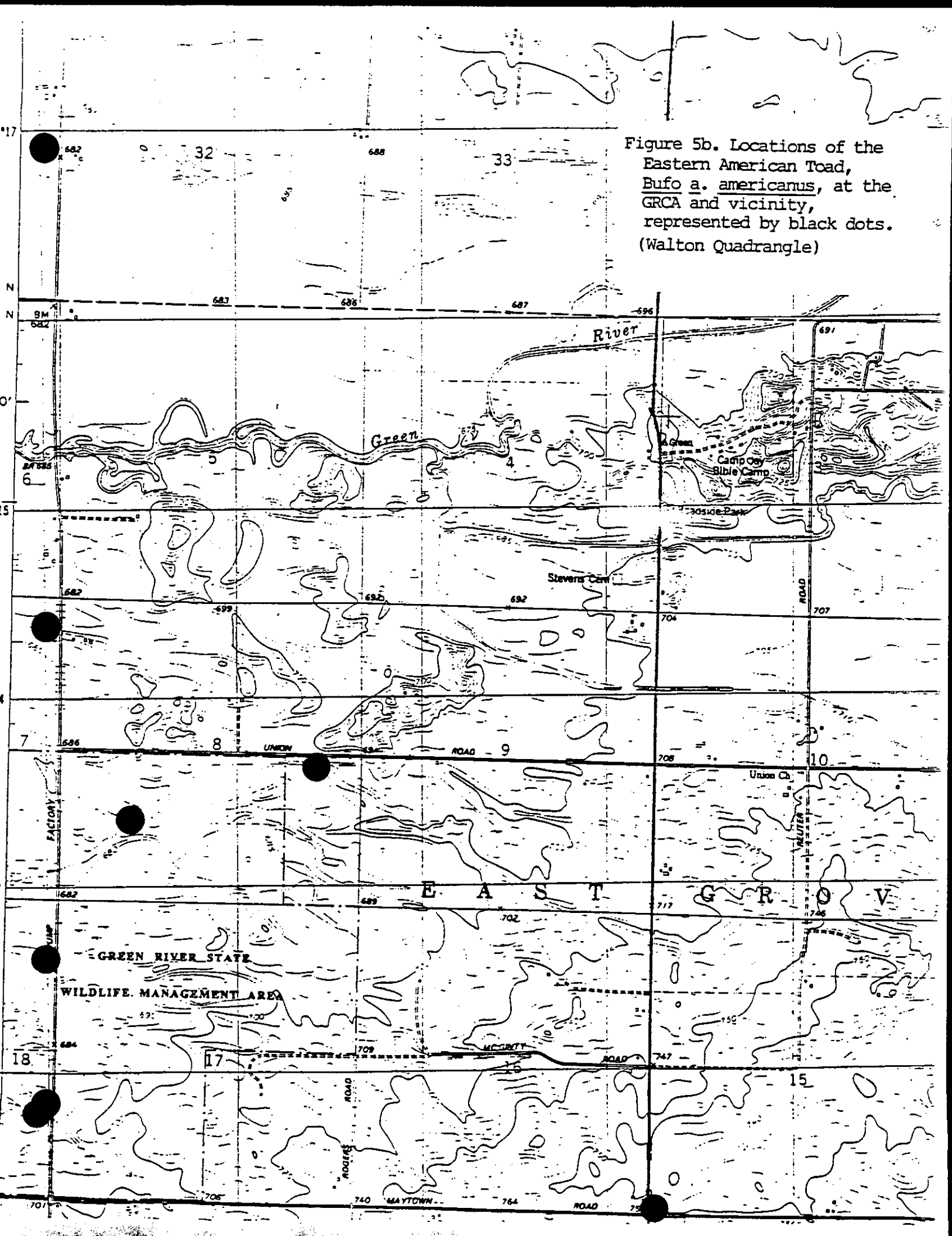


Figure 5b. Locations of the Eastern American Toad, Bufo a. americanus, at the GRCA and vicinity, represented by black dots. (Walton Quadrangle)

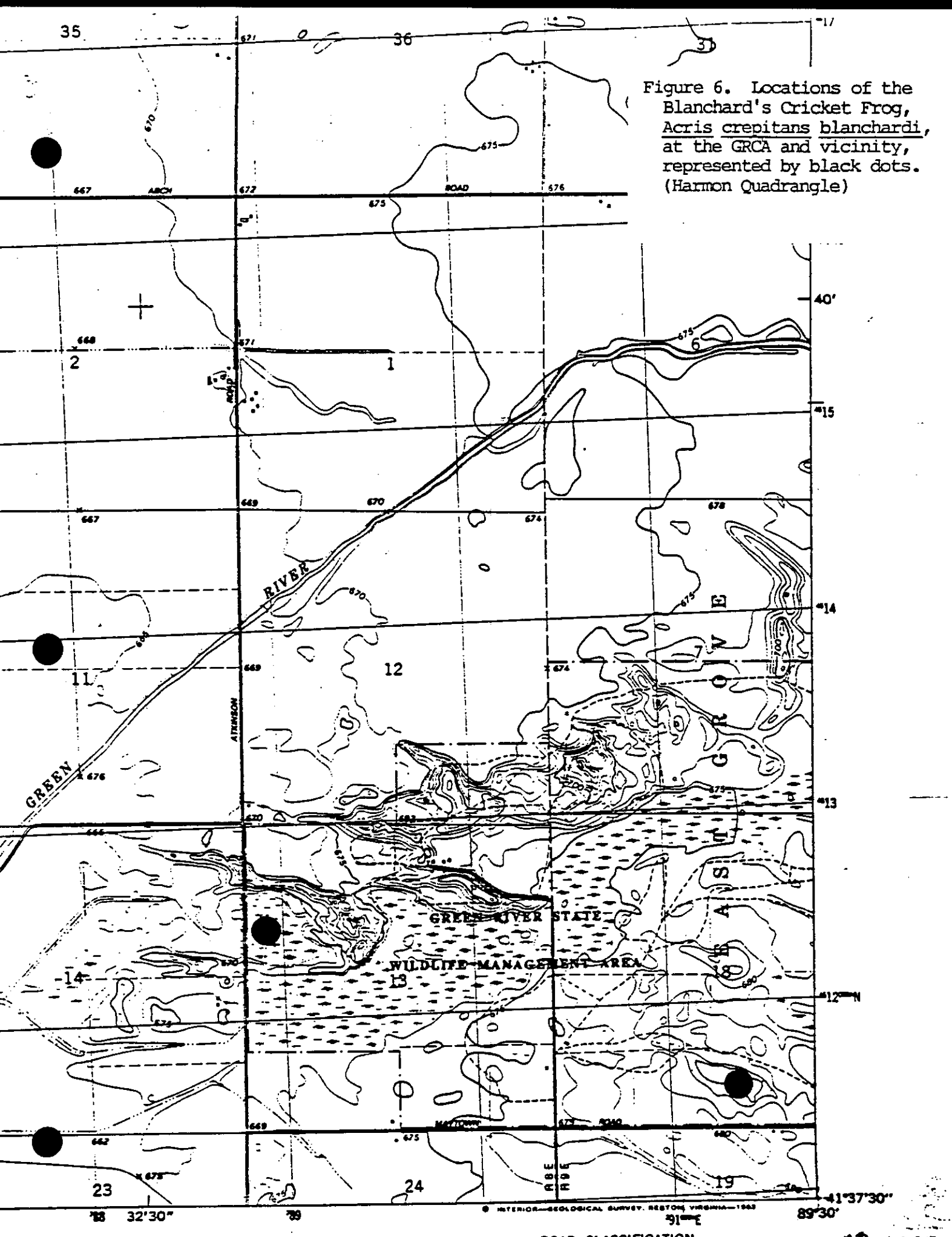


Figure 6. Locations of the Blanchard's Cricket Frog, Acris crepitans blanchardi, at the GRCA and vicinity, represented by black dots. (Harmon Quadrangle)

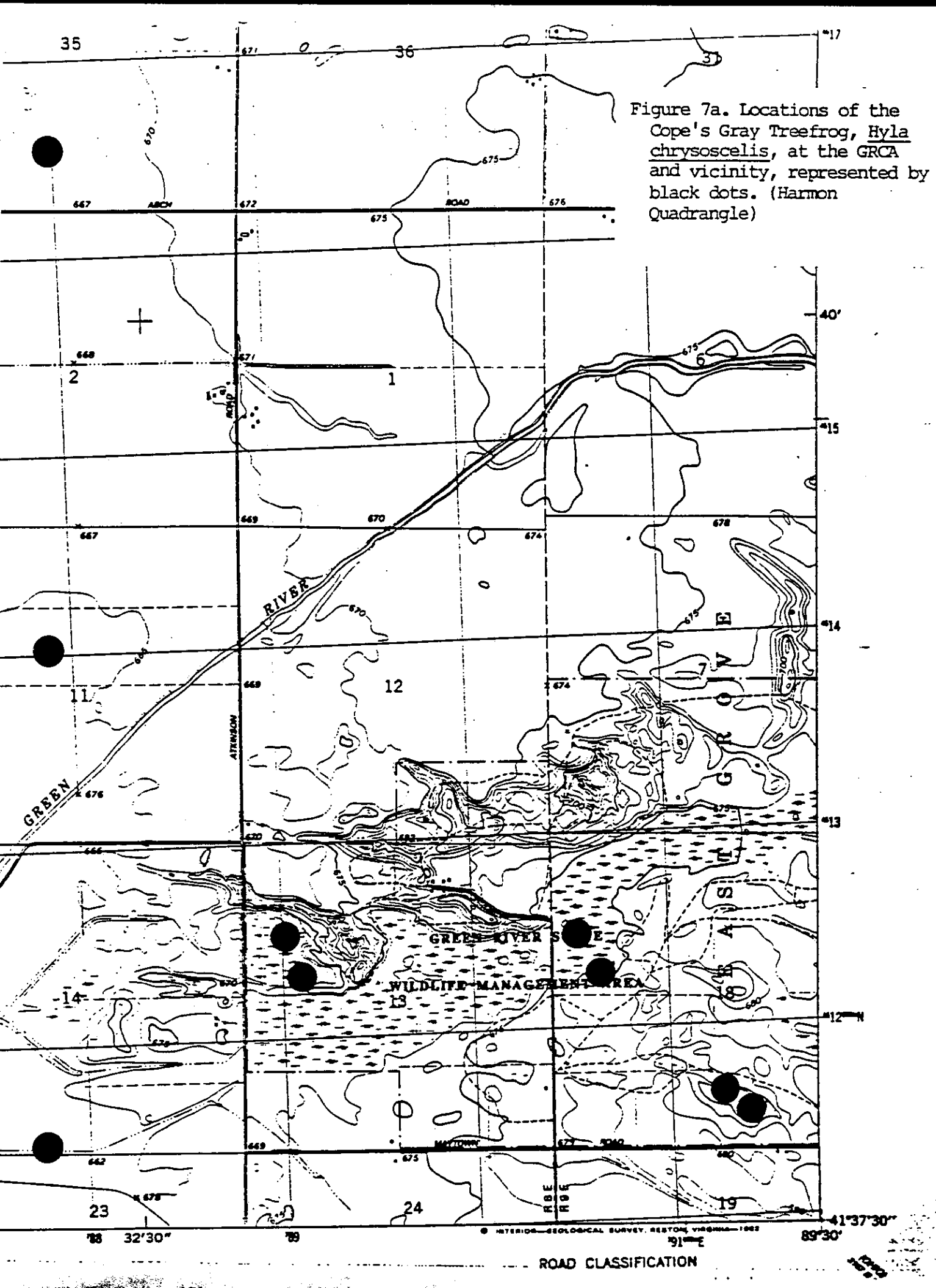


Figure 7a. Locations of the Cope's Gray Treefrog, Hyla chrysoscelis, at the GRCA and vicinity, represented by black dots. (Harmon Quadrangle)

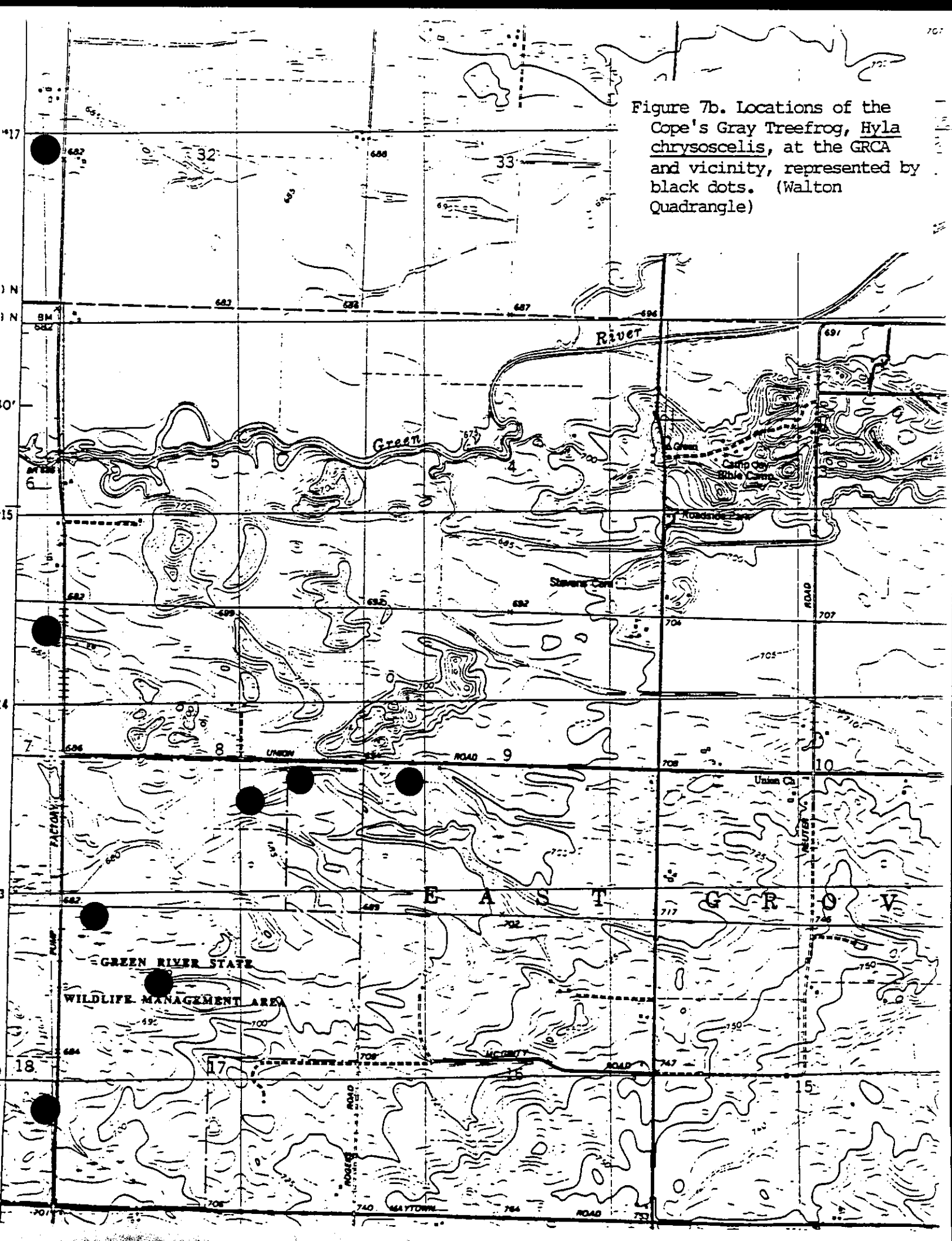


Figure 7b. Locations of the Cope's Gray Treefrog, Hyla chrysoscelis, at the GRCA and vicinity, represented by black dots. (Walton Quadrangle)

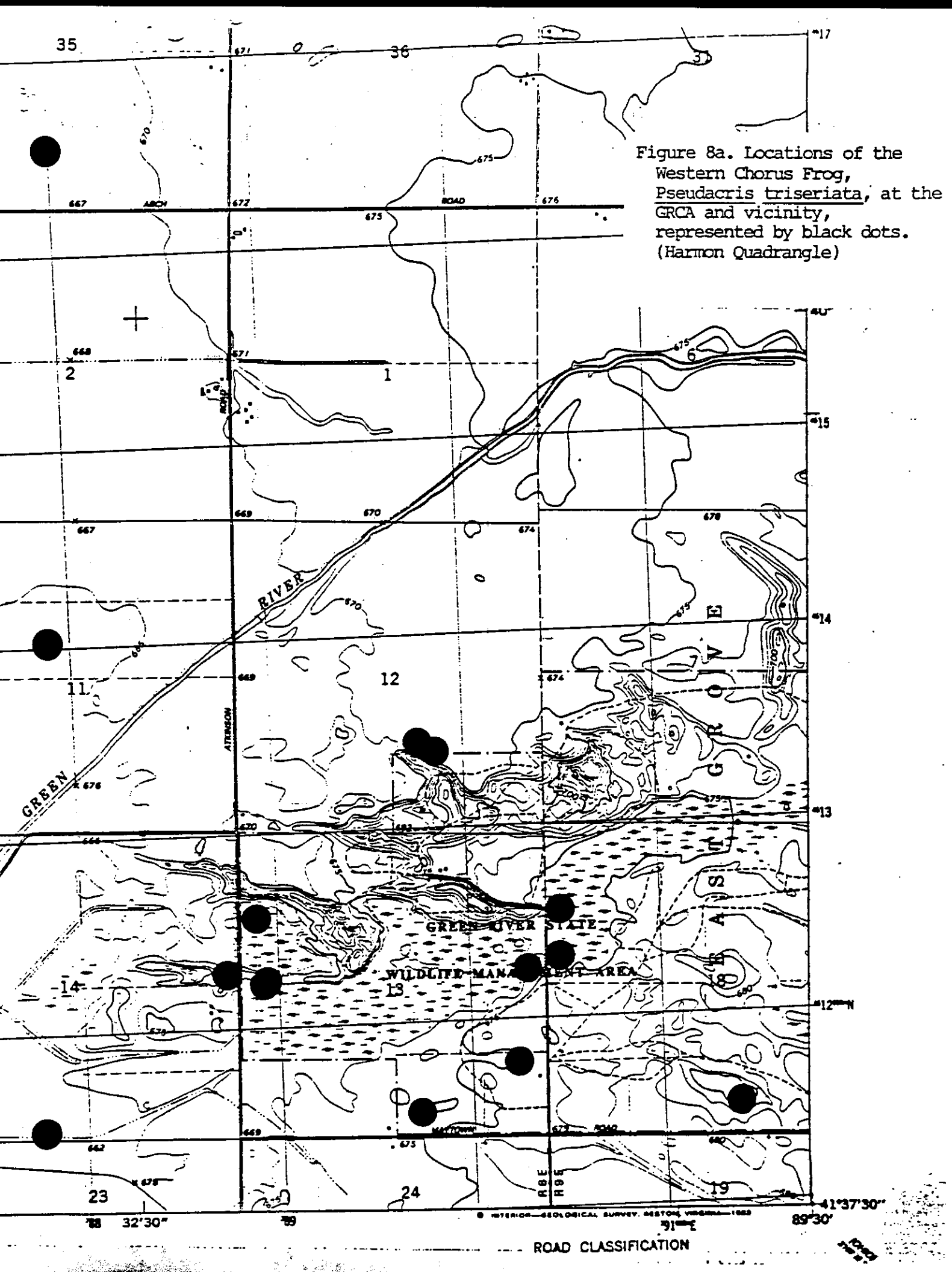


Figure 8a. Locations of the Western Chorus Frog, Pseudacris triseriata, at the GRCA and vicinity, represented by black dots. (Harmon Quadrangle)

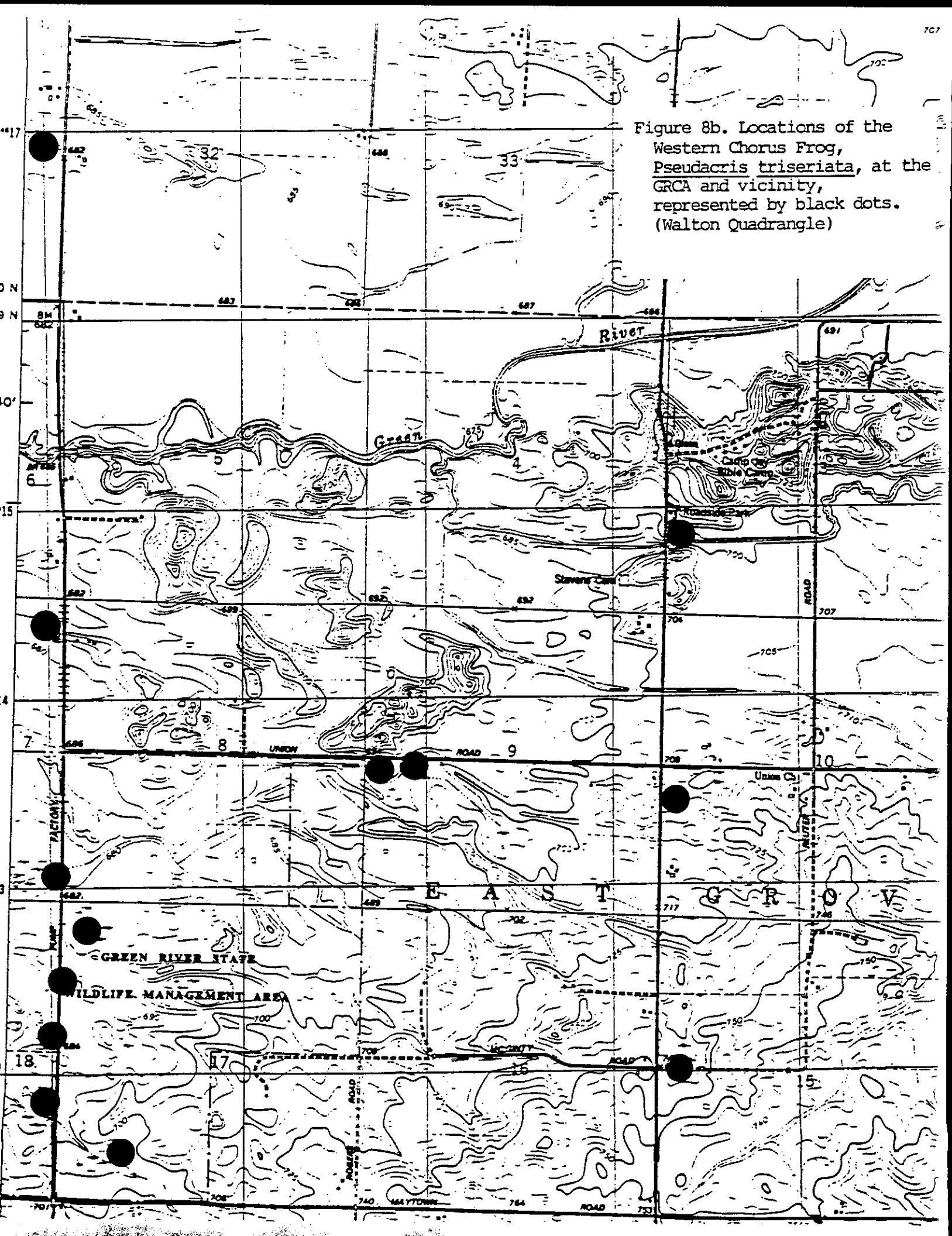


Figure 8b. Locations of the Western Chorus Frog, Pseudacris triseriata, at the GRCA and vicinity, represented by black dots. (Walton Quadrangle)

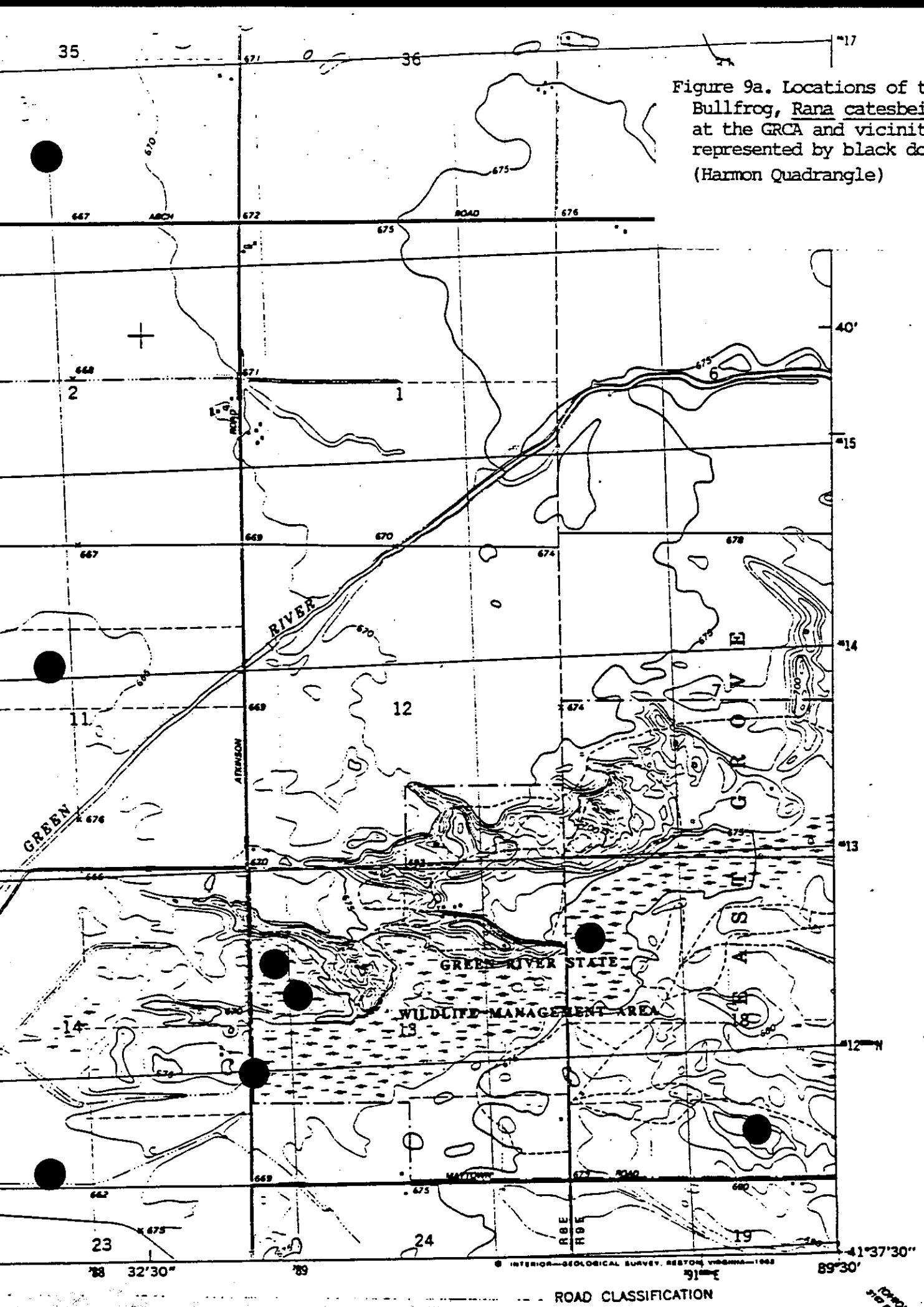


Figure 9a. Locations of the Bullfrog, Rana catesbeiana, at the GRCA and vicinity, represented by black dots. (Harmon Quadrangle)

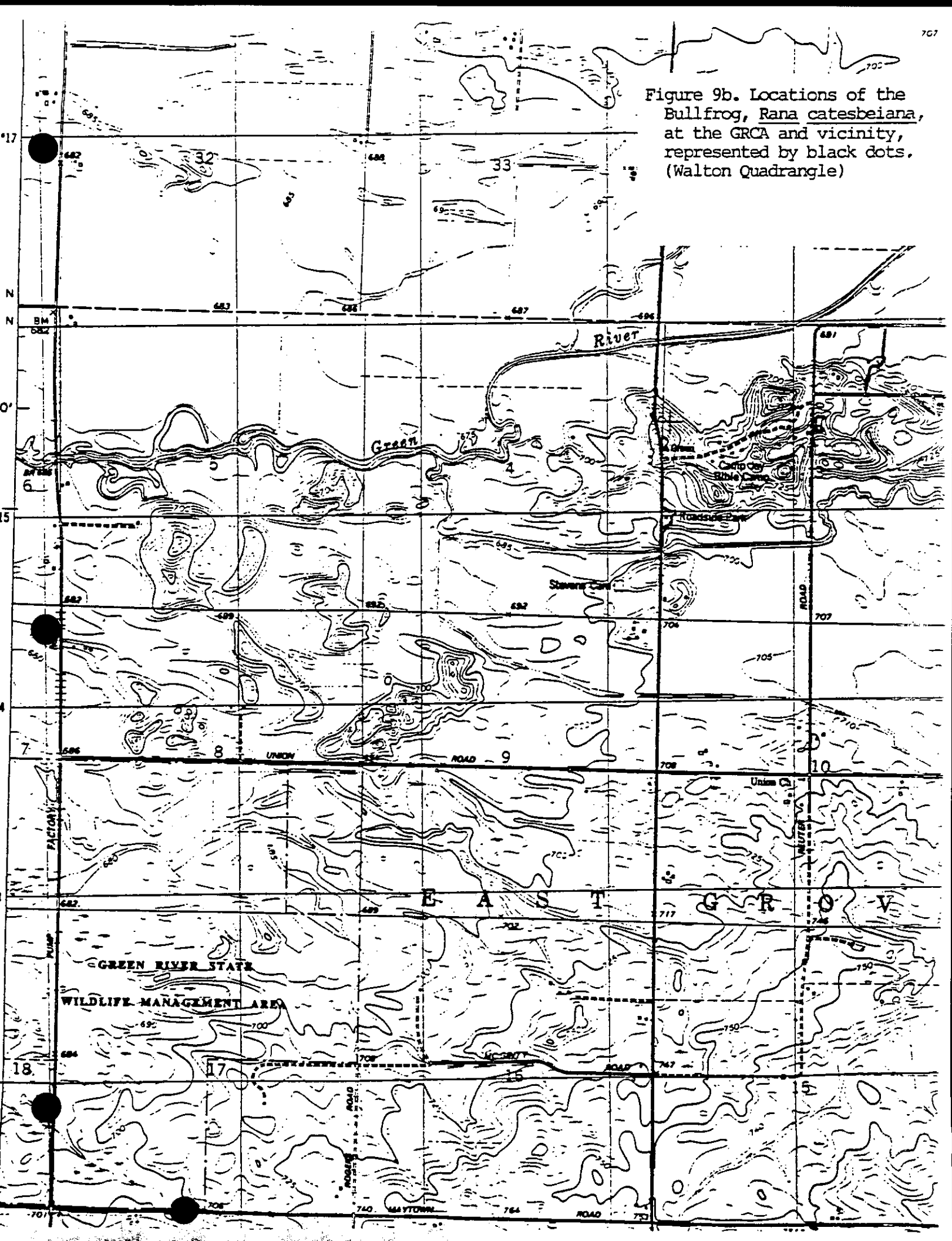


Figure 9b. Locations of the Bullfrog, Rana catesbeiana, at the GRCA and vicinity, represented by black dots. (Walton Quadrangle)

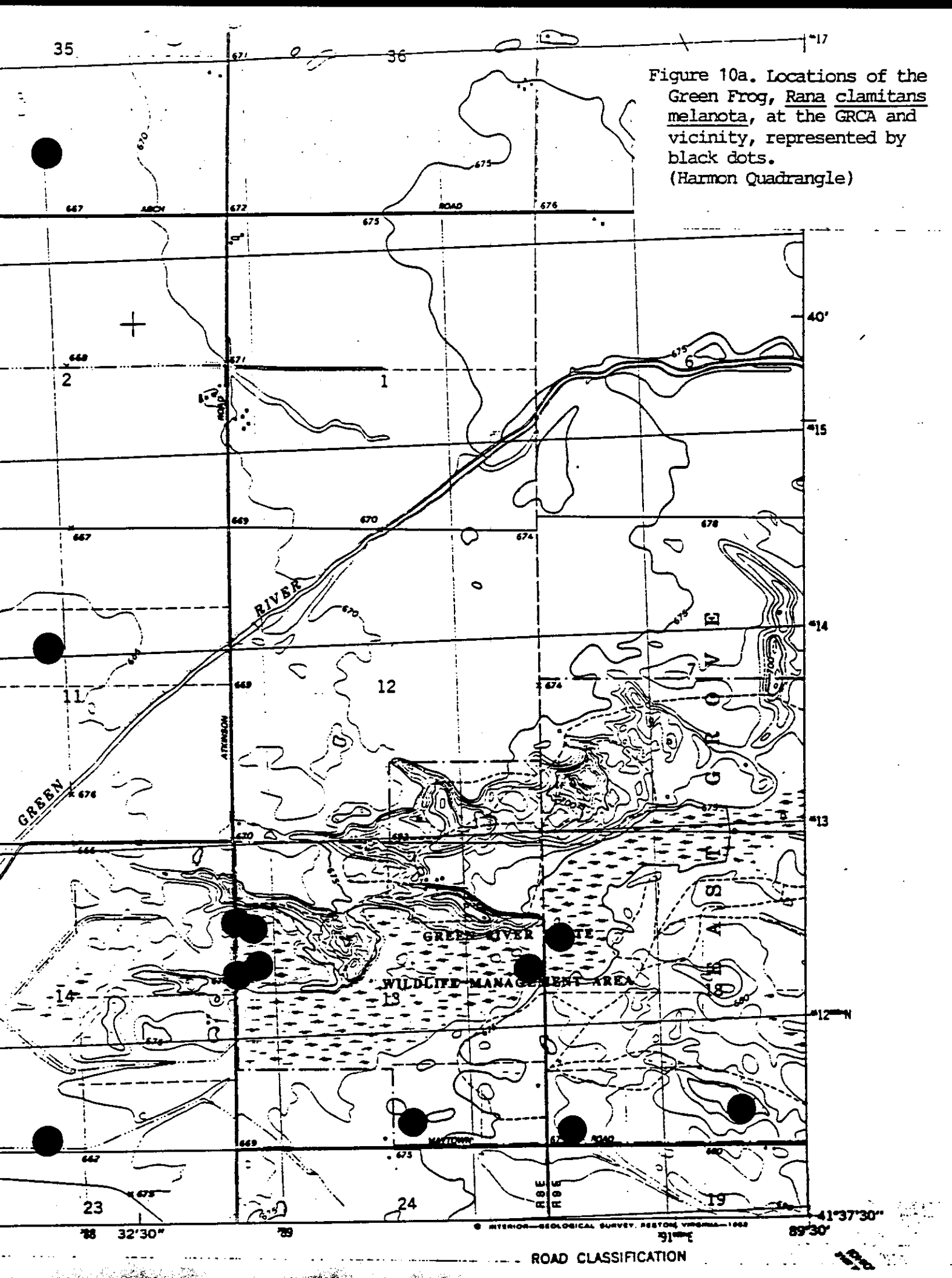


Figure 10a. Locations of the Green Frog, Rana clamitans melanota, at the GRCA and vicinity, represented by black dots. (Harmon Quadrangle)

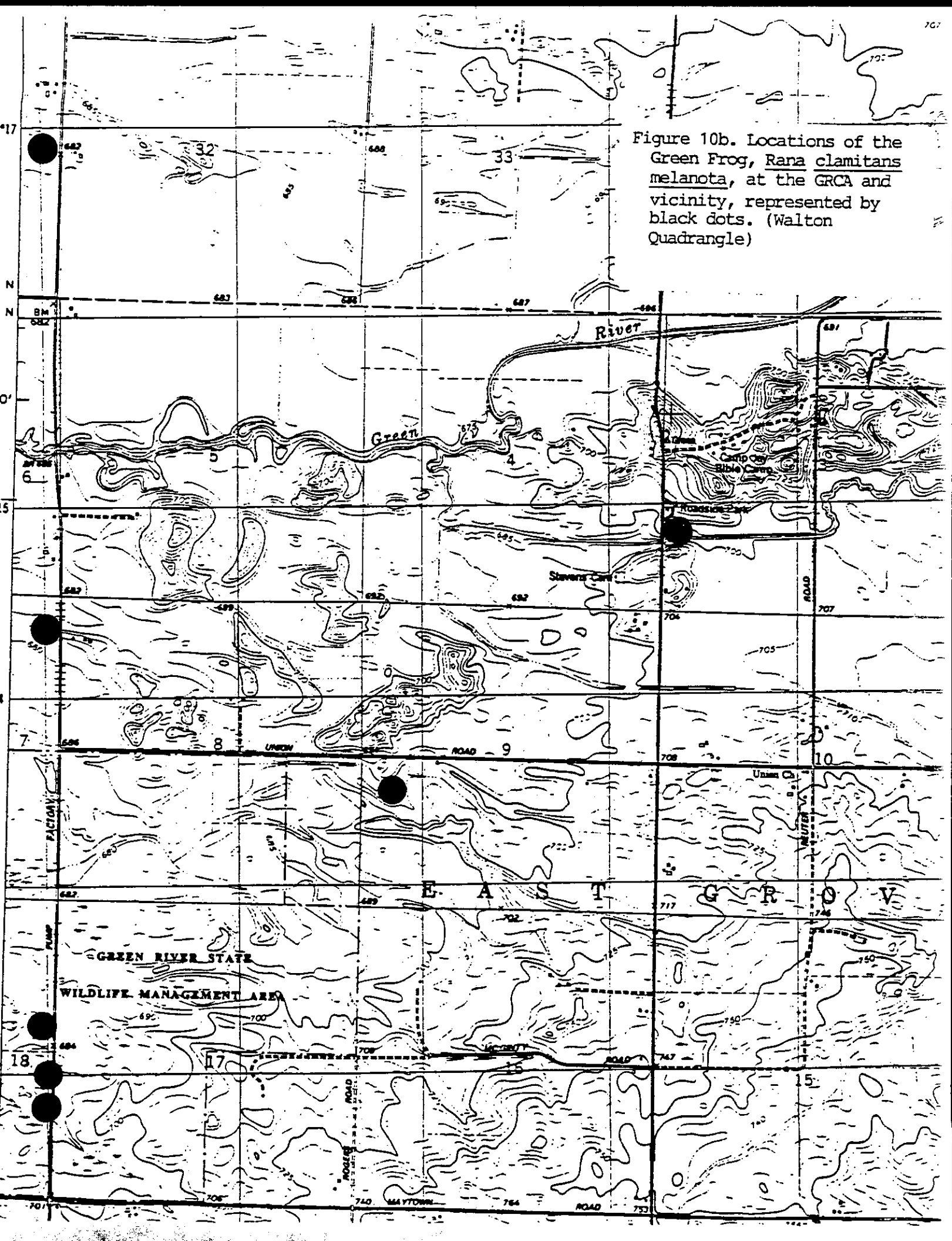


Figure 10b. Locations of the Green Frog, Rana clamitans melanota, at the GRCA and vicinity, represented by black dots. (Walton Quadrangle)

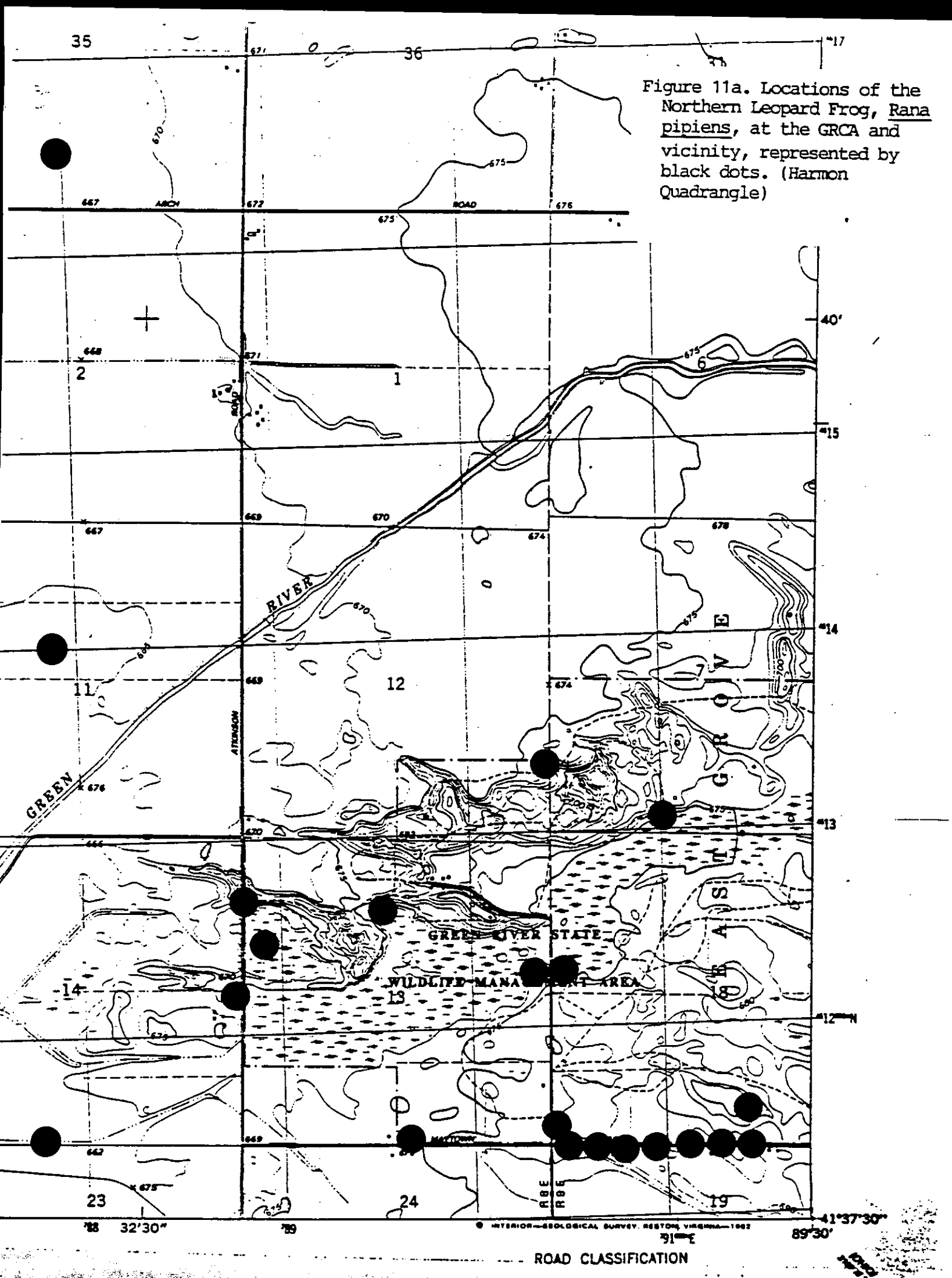


Figure 11a. Locations of the Northern Leopard Frog, Rana pipiens, at the GRCA and vicinity, represented by black dots. (Harmon Quadrangle)

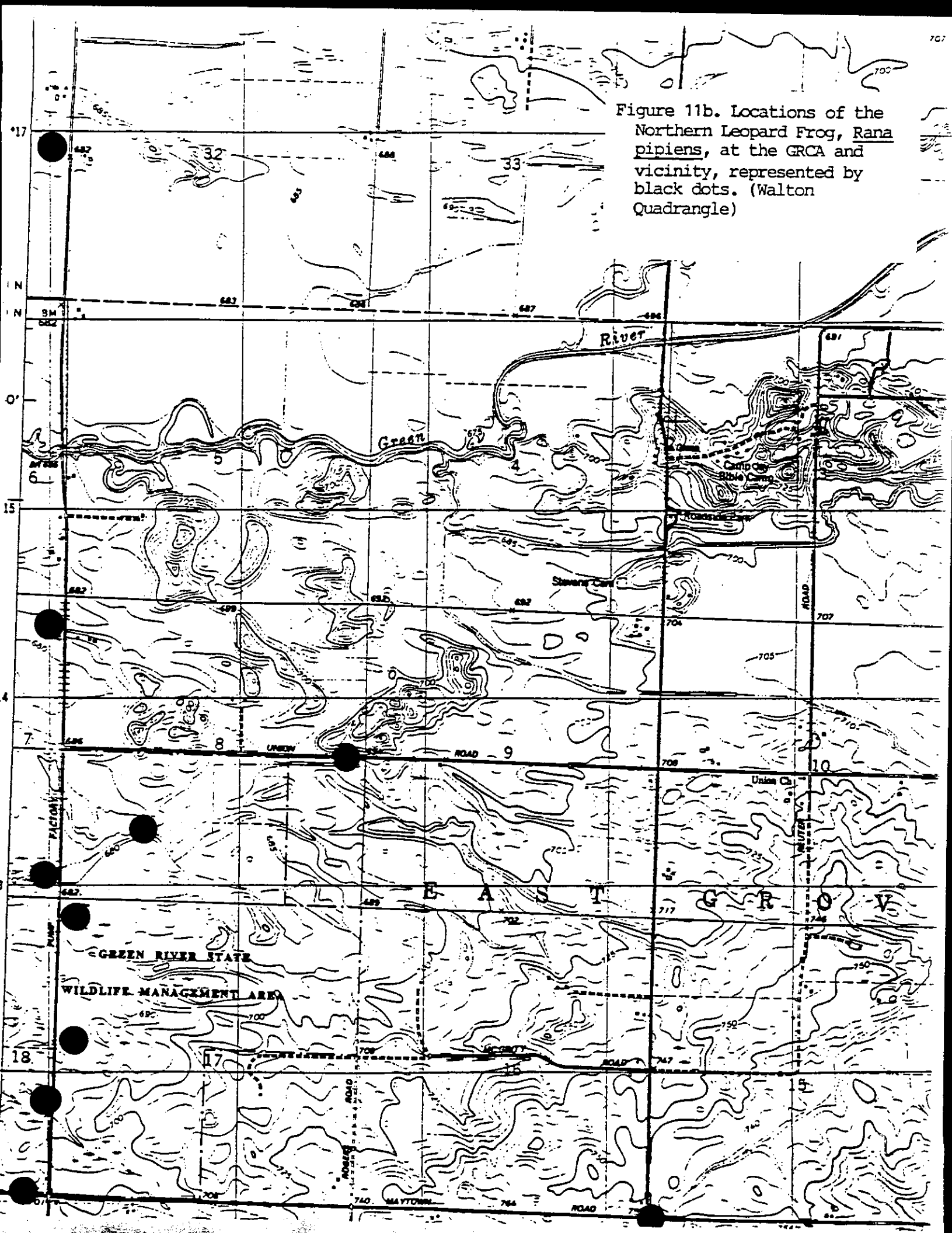


Figure 11b. Locations of the Northern Leopard Frog, Rana pipiens, at the GRCA and vicinity, represented by black dots. (Walton Quadrangle)

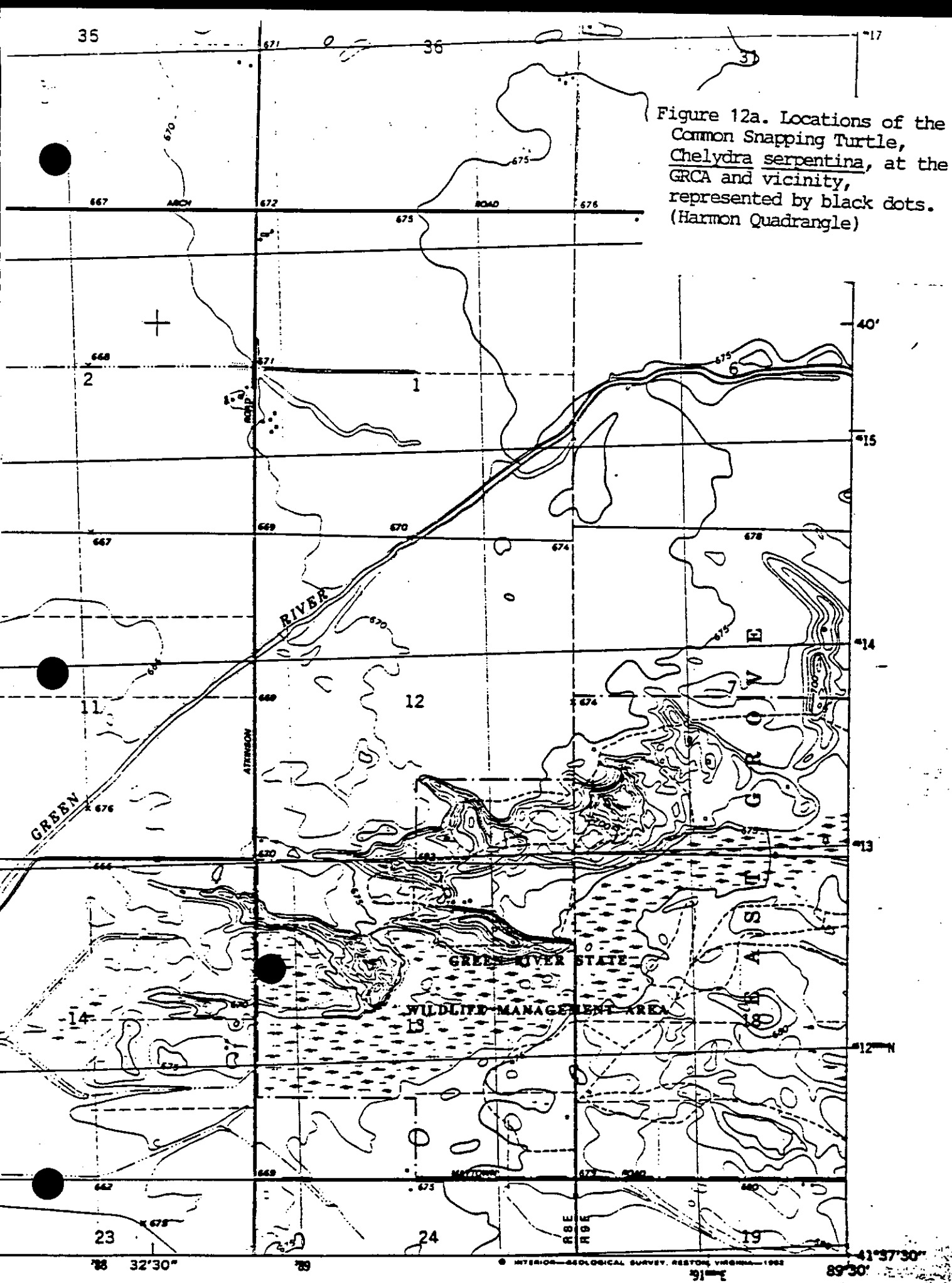


Figure 12a. Locations of the Common Snapping Turtle, Chelydra serpentina, at the GRCA and vicinity, represented by black dots. (Harmon Quadrangle)

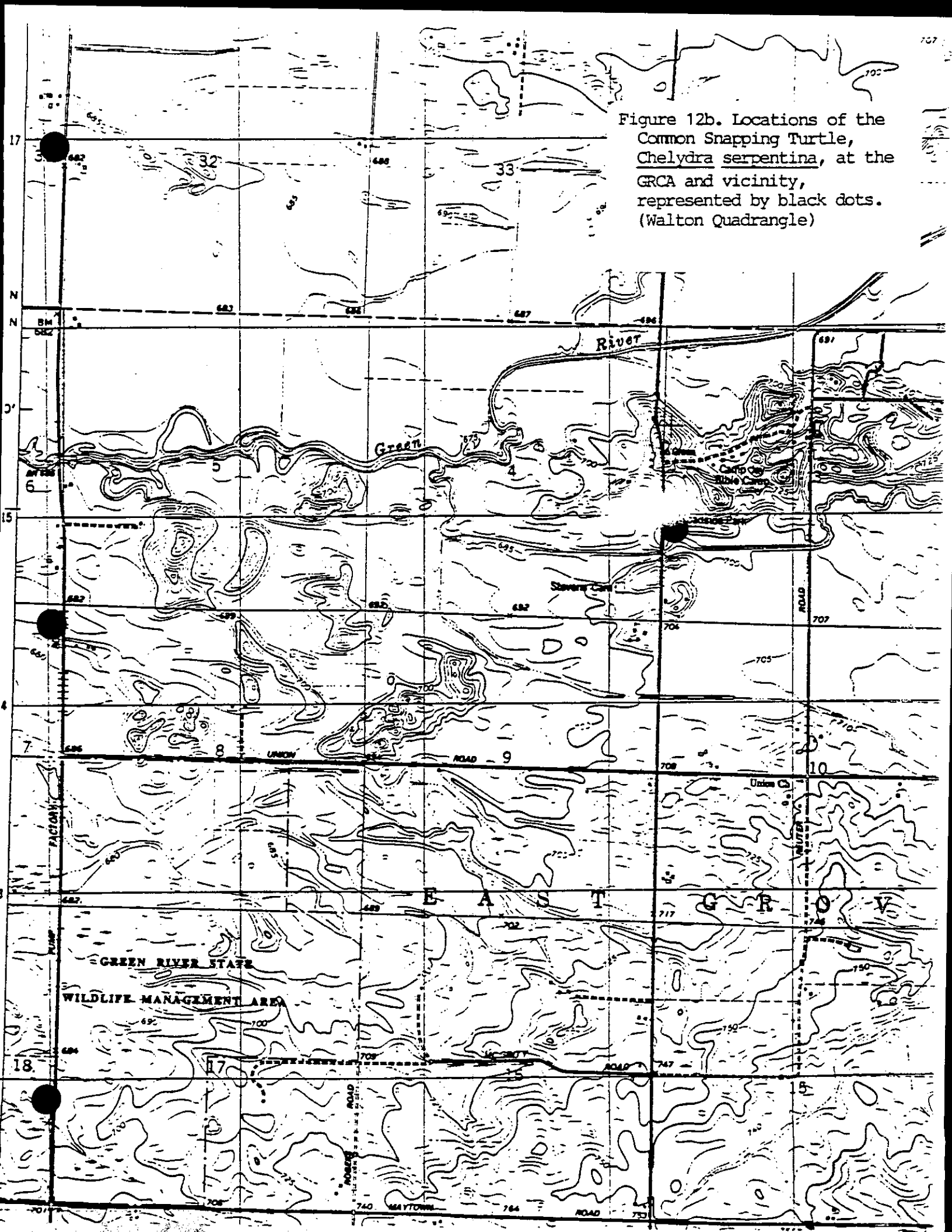


Figure 12b. Locations of the Common Snapping Turtle, Chelydra serpentina, at the GRCA and vicinity, represented by black dots. (Walton Quadrangle)

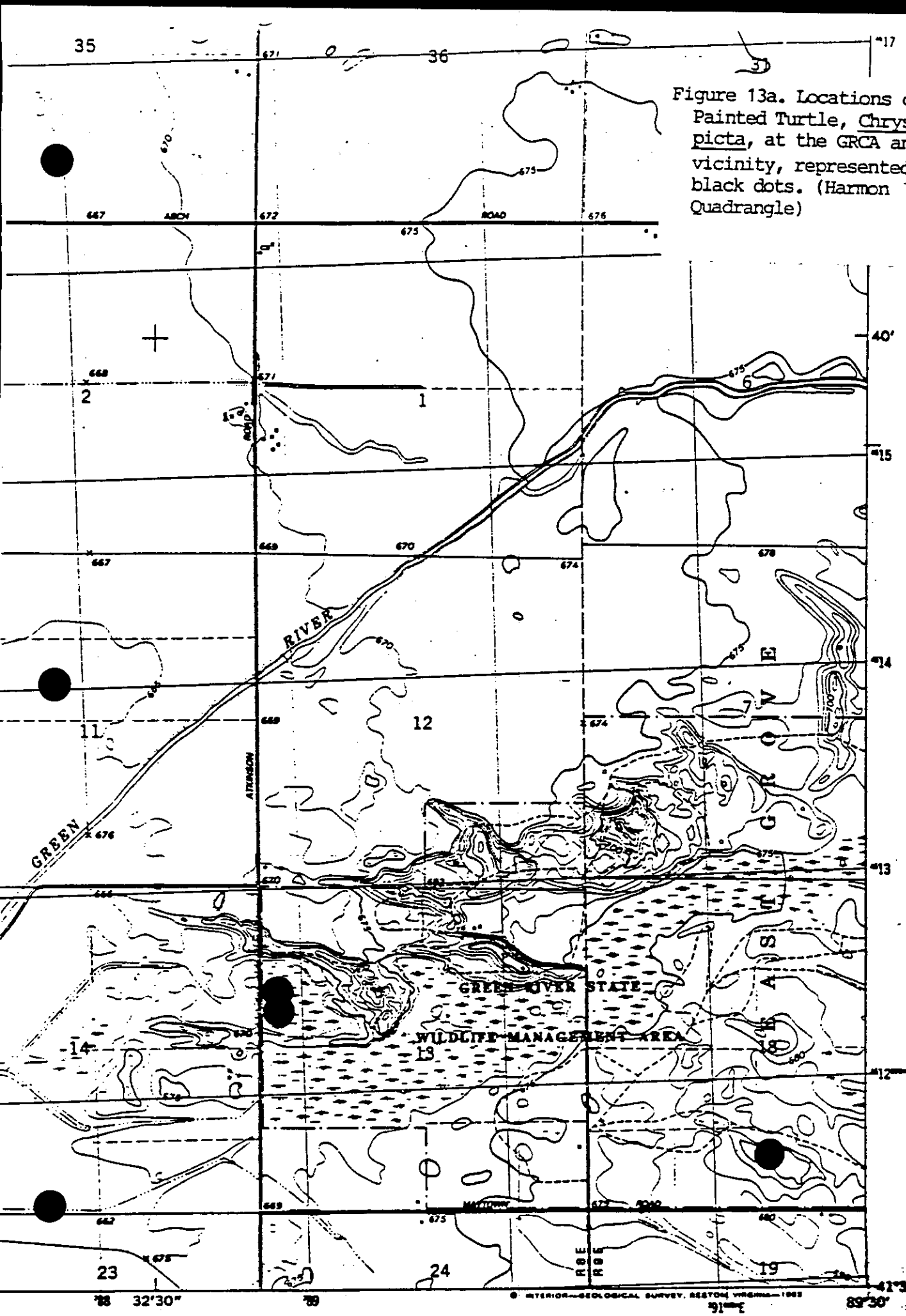


Figure 13a. Locations of the Painted Turtle, Chrysemys picta, at the GRCA and vicinity, represented by black dots. (Harmon [illegible] Quadrangle)

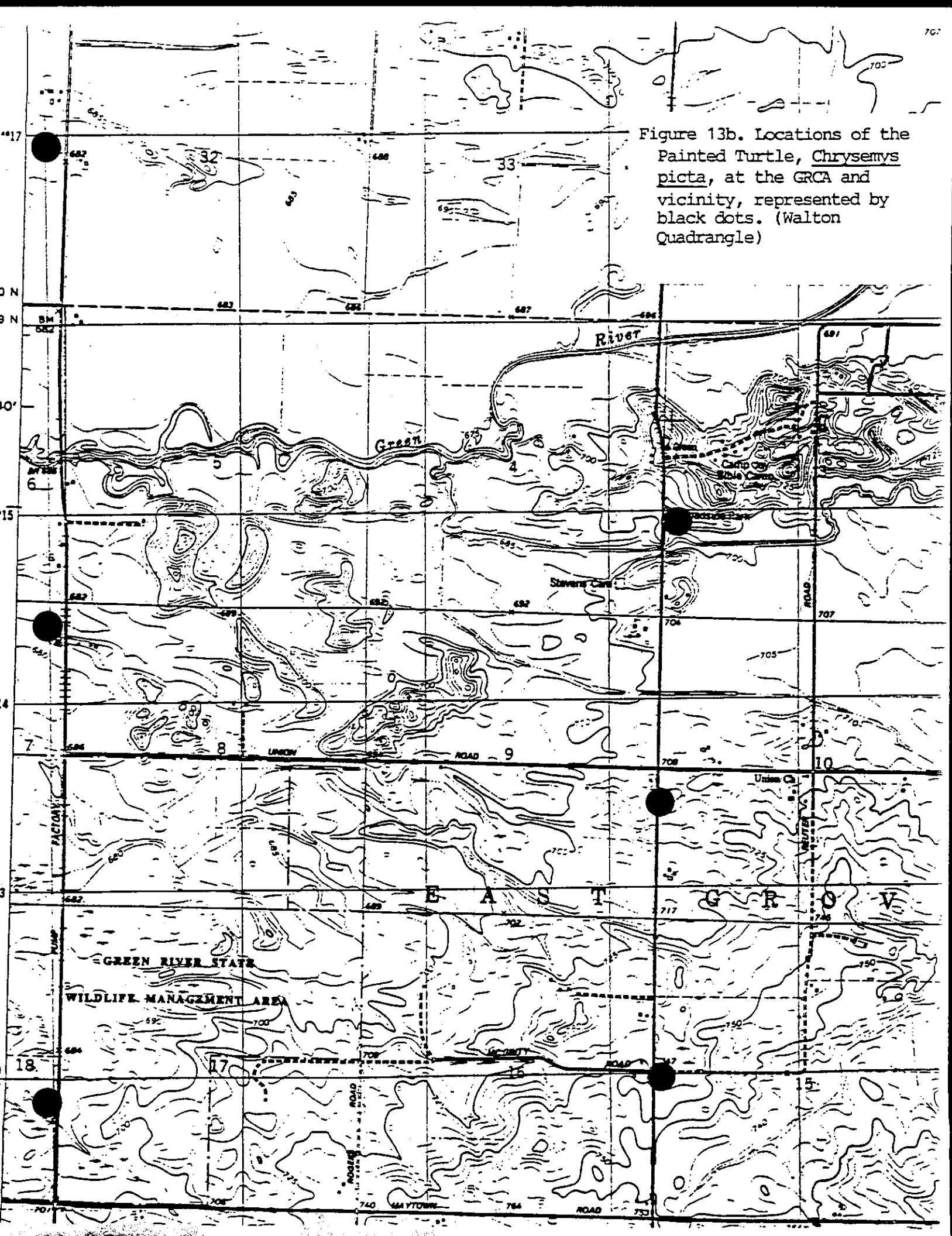


Figure 13b. Locations of the Painted Turtle, Chrysemys picta, at the GRCA and vicinity, represented by black dots. (Walton Quadrangle)

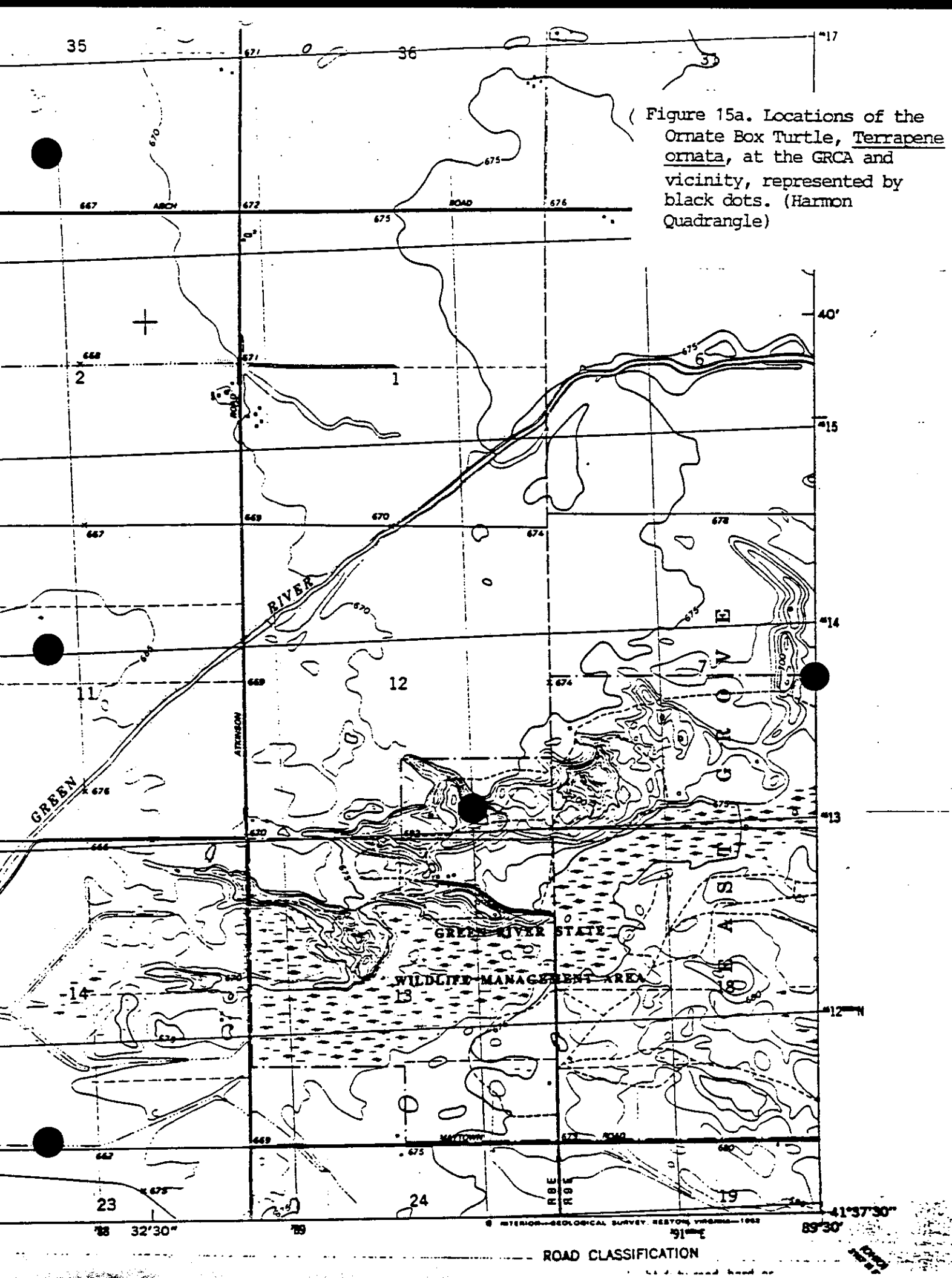


Figure 15a. Locations of the Ornate Box Turtle, Terrapene ornata, at the GRCA and vicinity, represented by black dots. (Harmon Quadrangle)

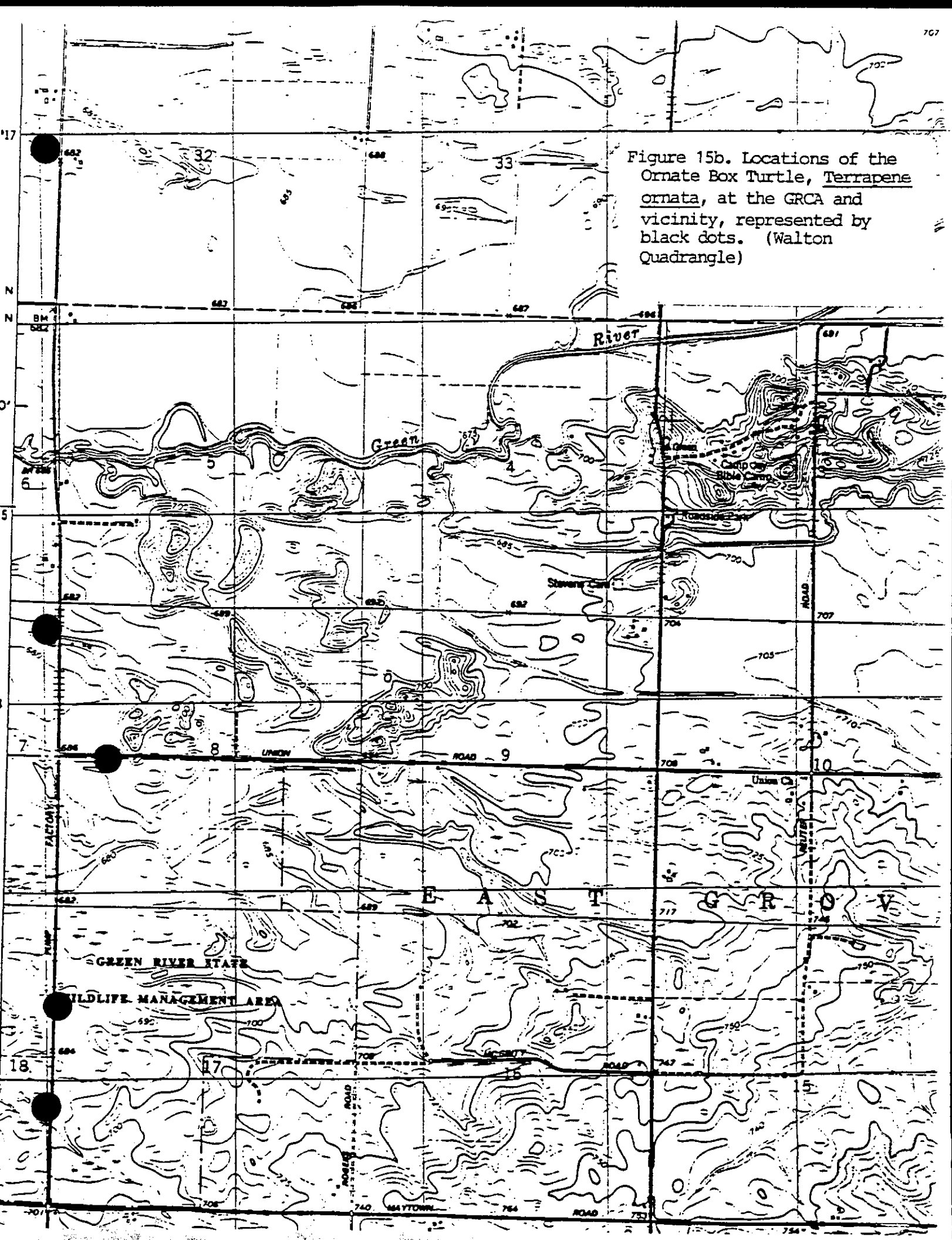


Figure 15b. Locations of the Ornate Box Turtle, Terrapene ornata, at the GRCA and vicinity, represented by black dots. (Walton Quadrangle)

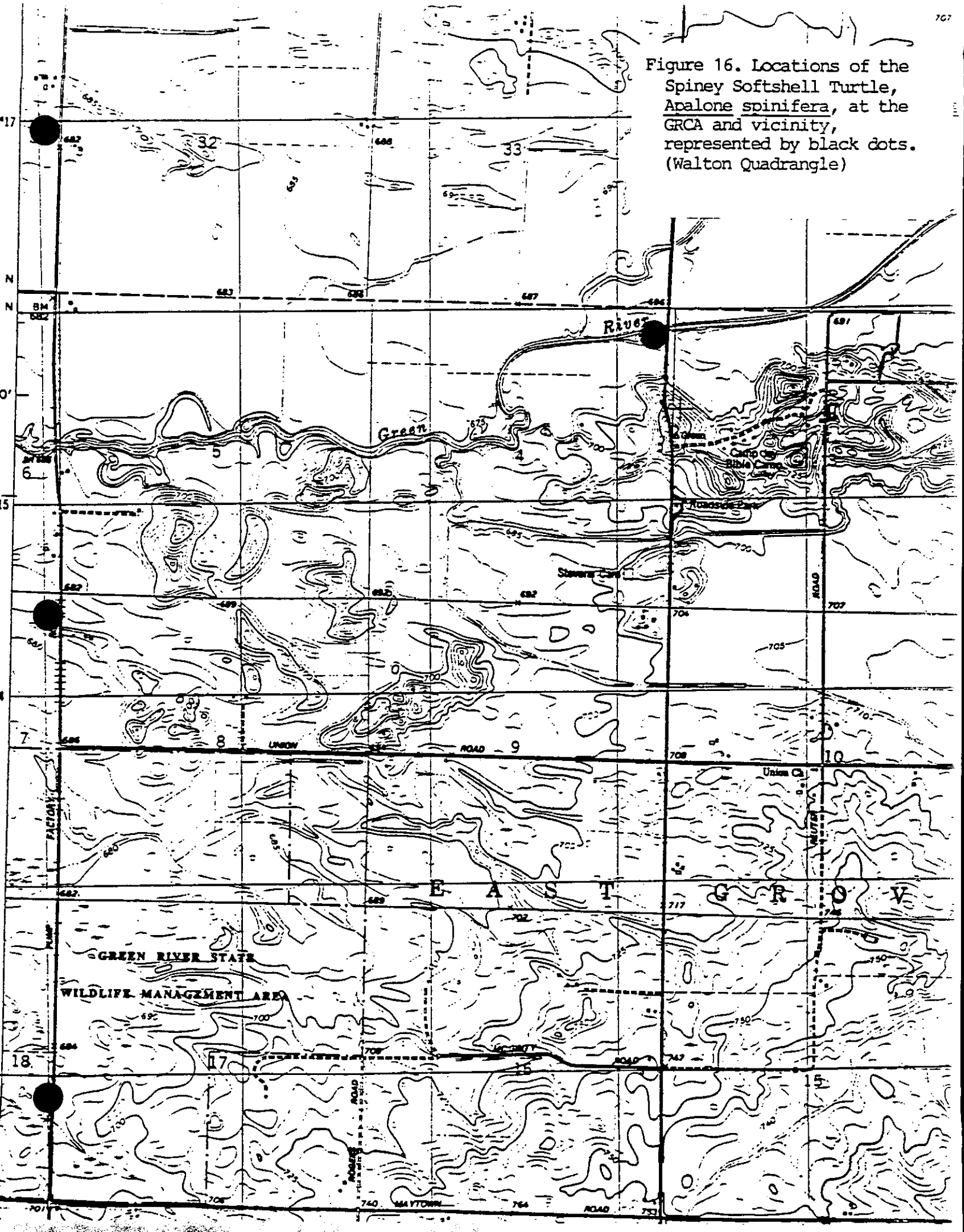


Figure 16. Locations of the Spiney Softshell Turtle, Apalone spinifera, at the GRCA and vicinity, represented by black dots. (Walton Quadrangle)

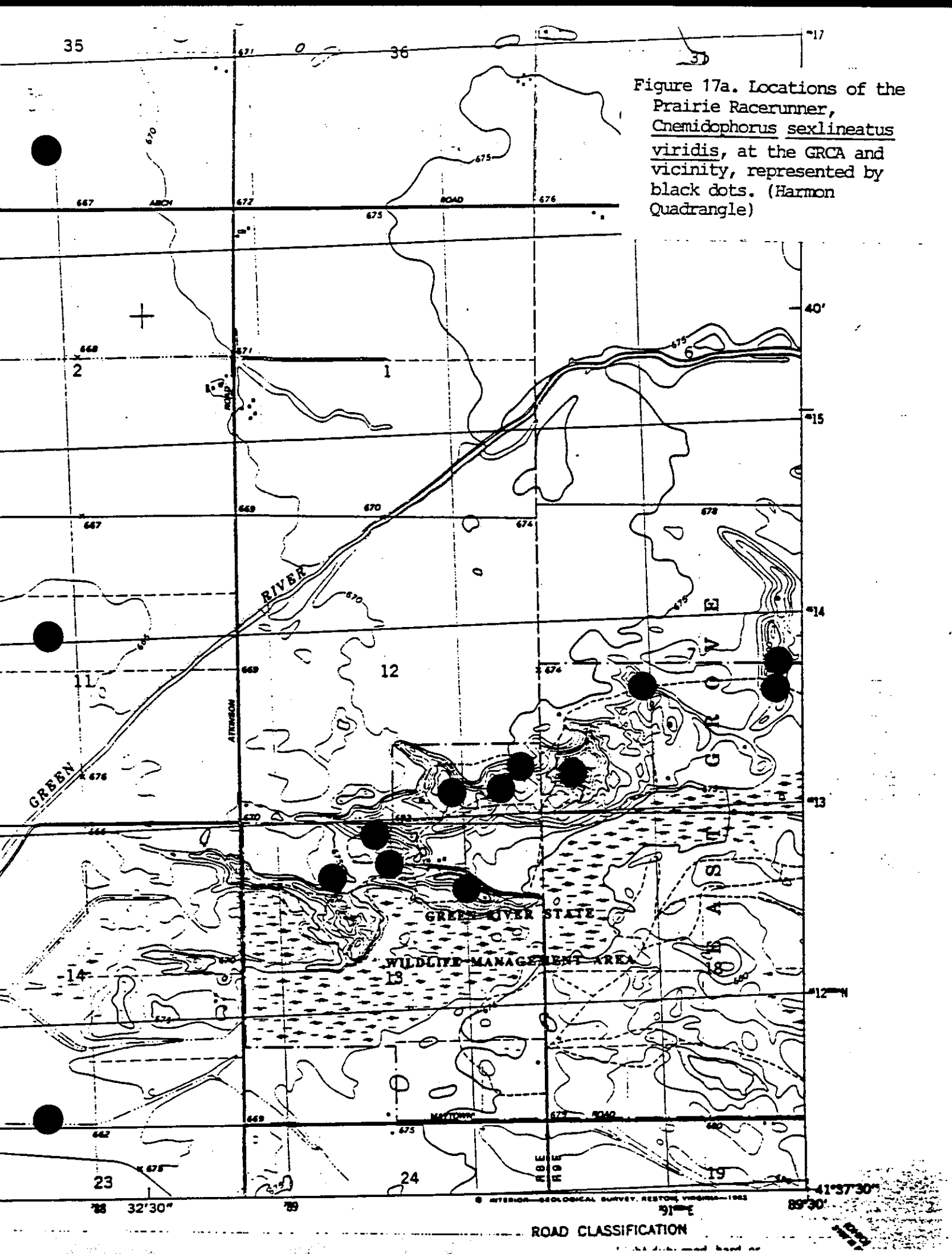


Figure 17a. Locations of the Prairie Racerunner, Cnemidophorus sexlineatus viridis, at the GRCA and vicinity, represented by black dots. (Harmon Quadrangle)

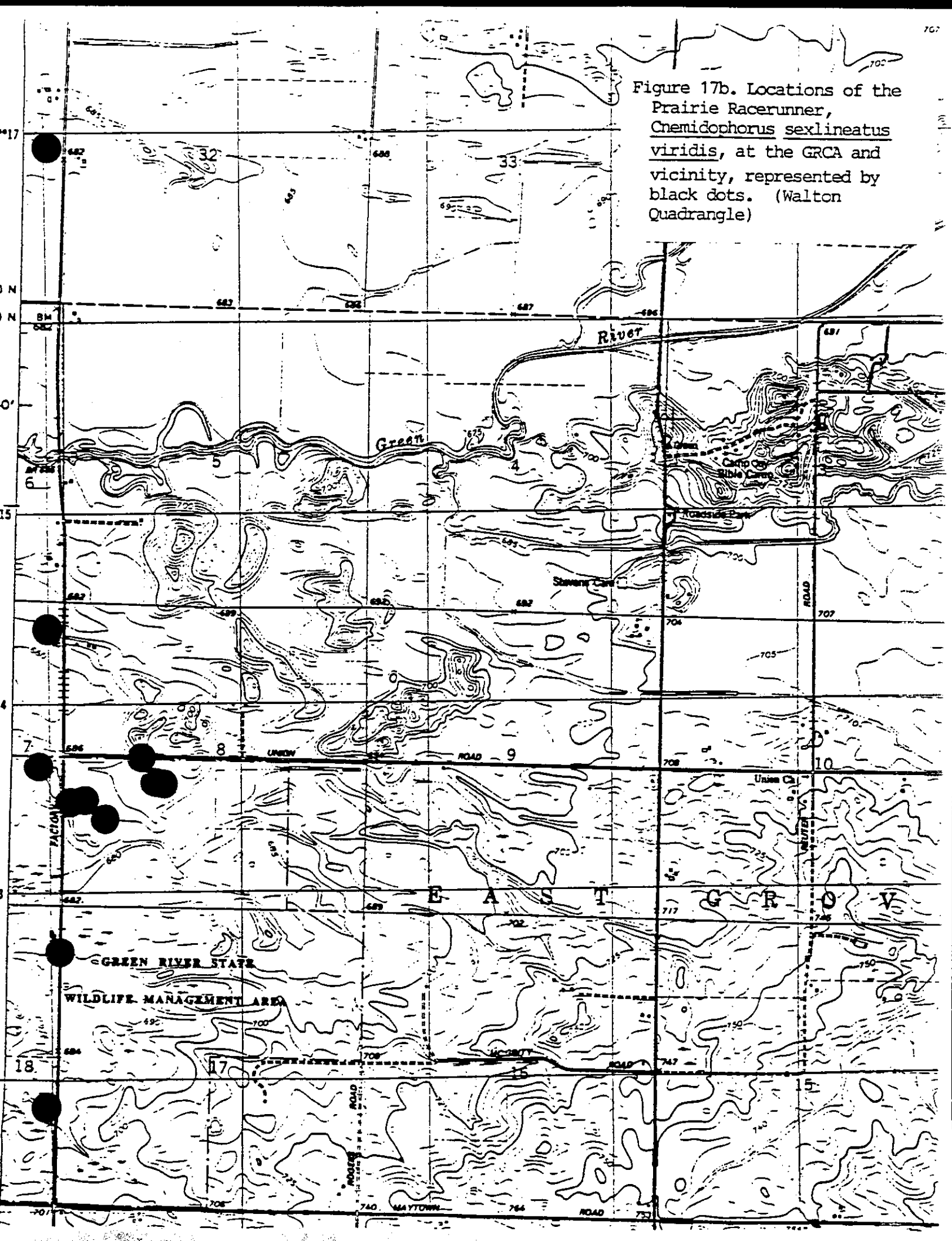


Figure 17b. Locations of the Prairie Racerunner, Cnemidophorus sexlineatus viridis, at the GRCA and vicinity, represented by black dots. (Walton Quadrangle)

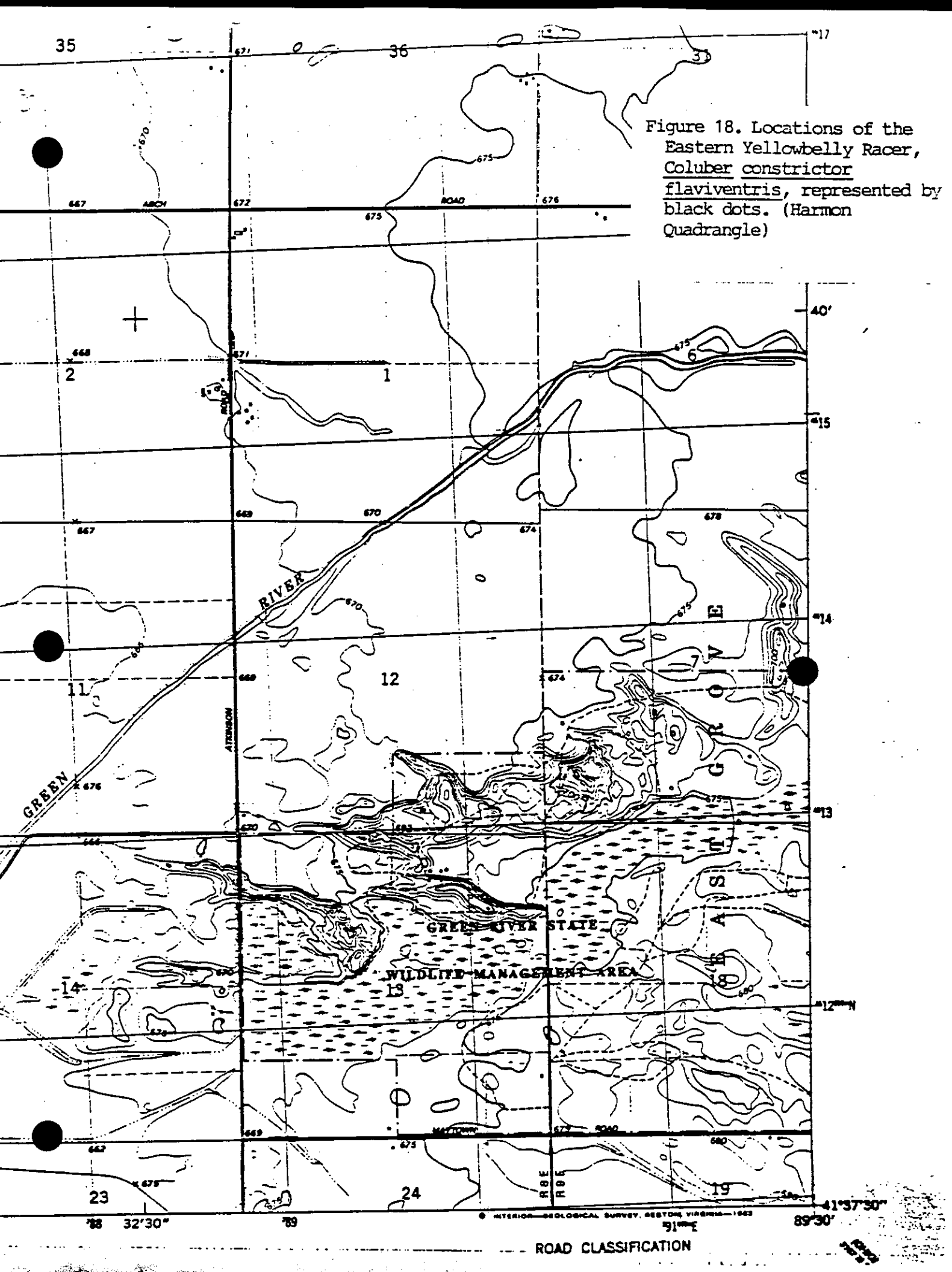


Figure 18. Locations of the Eastern Yellowbelly Racer, Coluber constrictor flaviventris, represented by black dots. (Harmon Quadrangle)

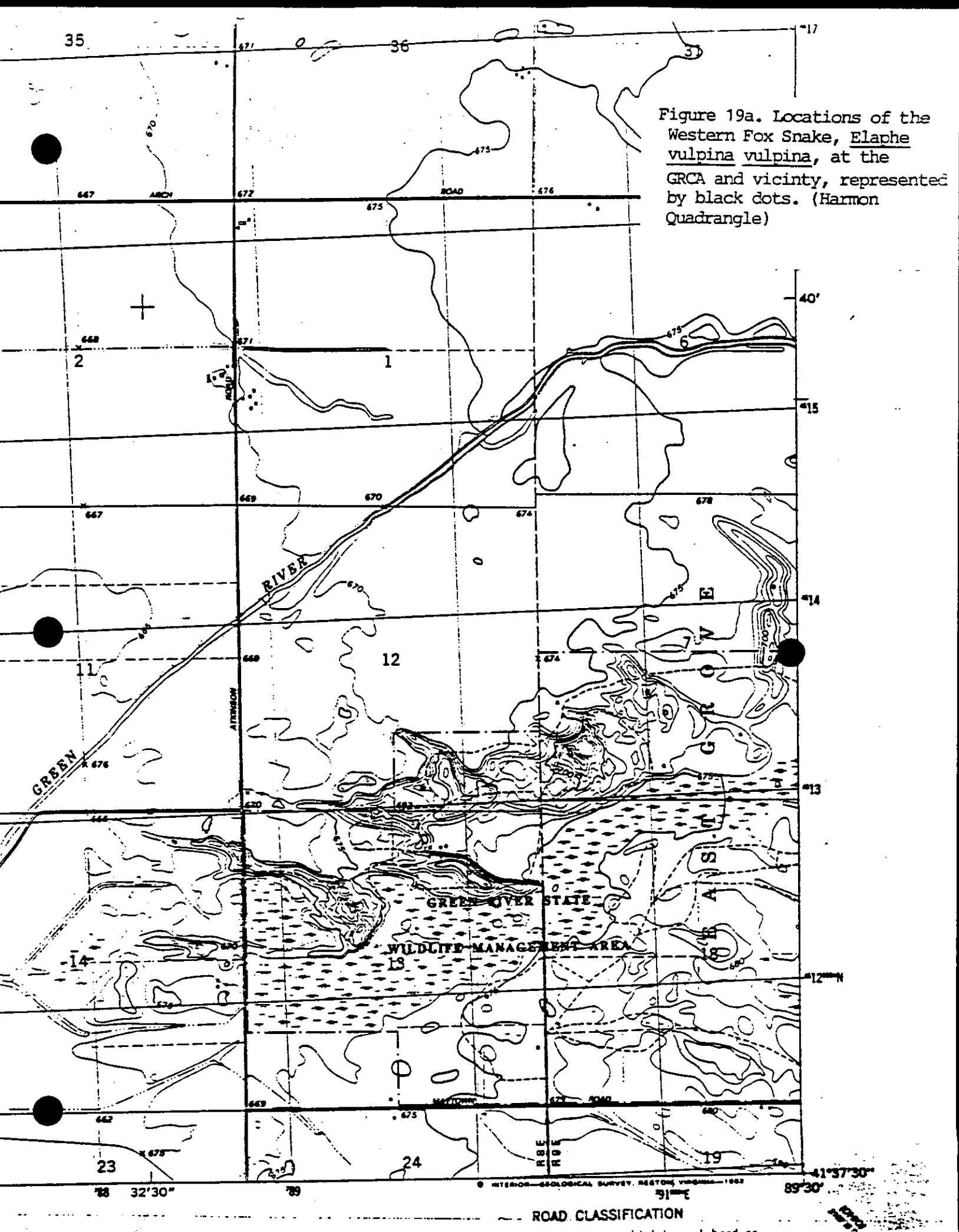


Figure 19a. Locations of the Western Fox Snake, Elaphe vulpina vulpina, at the GRCA and vicinty, represented by black dots. (Harmon Quadrangle)

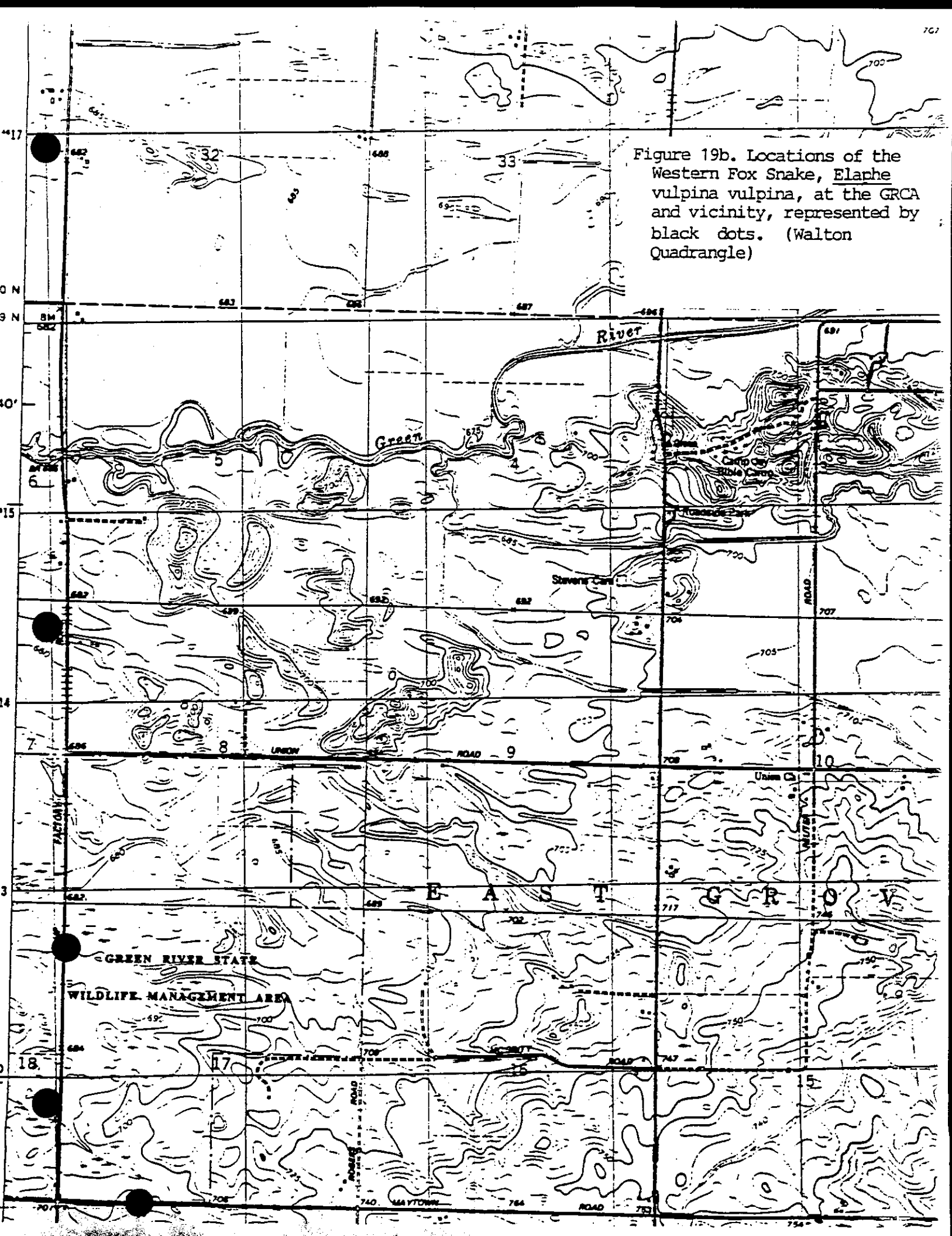


Figure 19b. Locations of the Western Fox Snake, Elaphe vulpina vulpina, at the GRCA and vicinity, represented by black dots. (Walton Quadrangle)

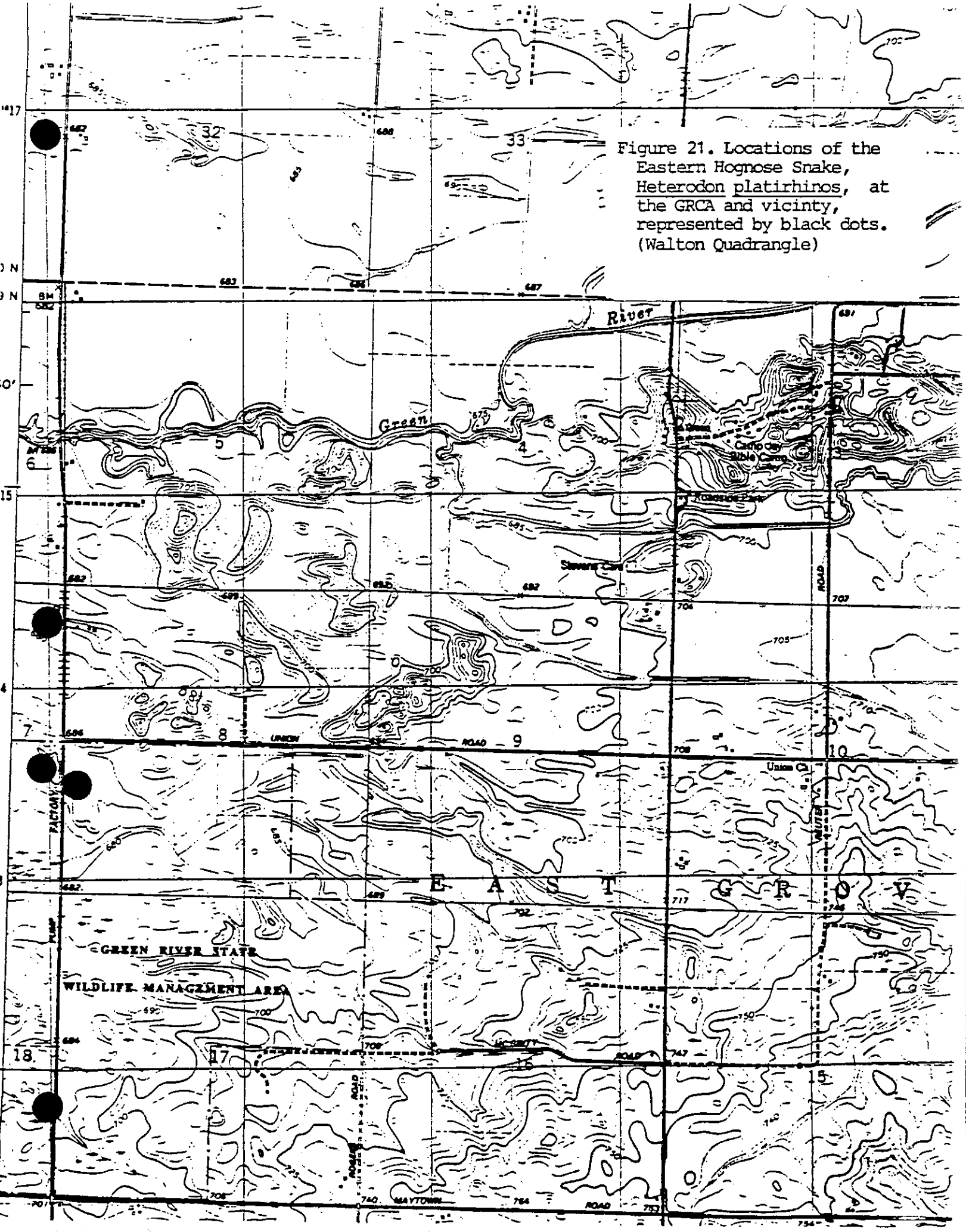


Figure 21. Locations of the Eastern Hognose Snake, Heterodon platirhinos, at the GRCA and vicinty, represented by black dots. (Walton Quadrangle)

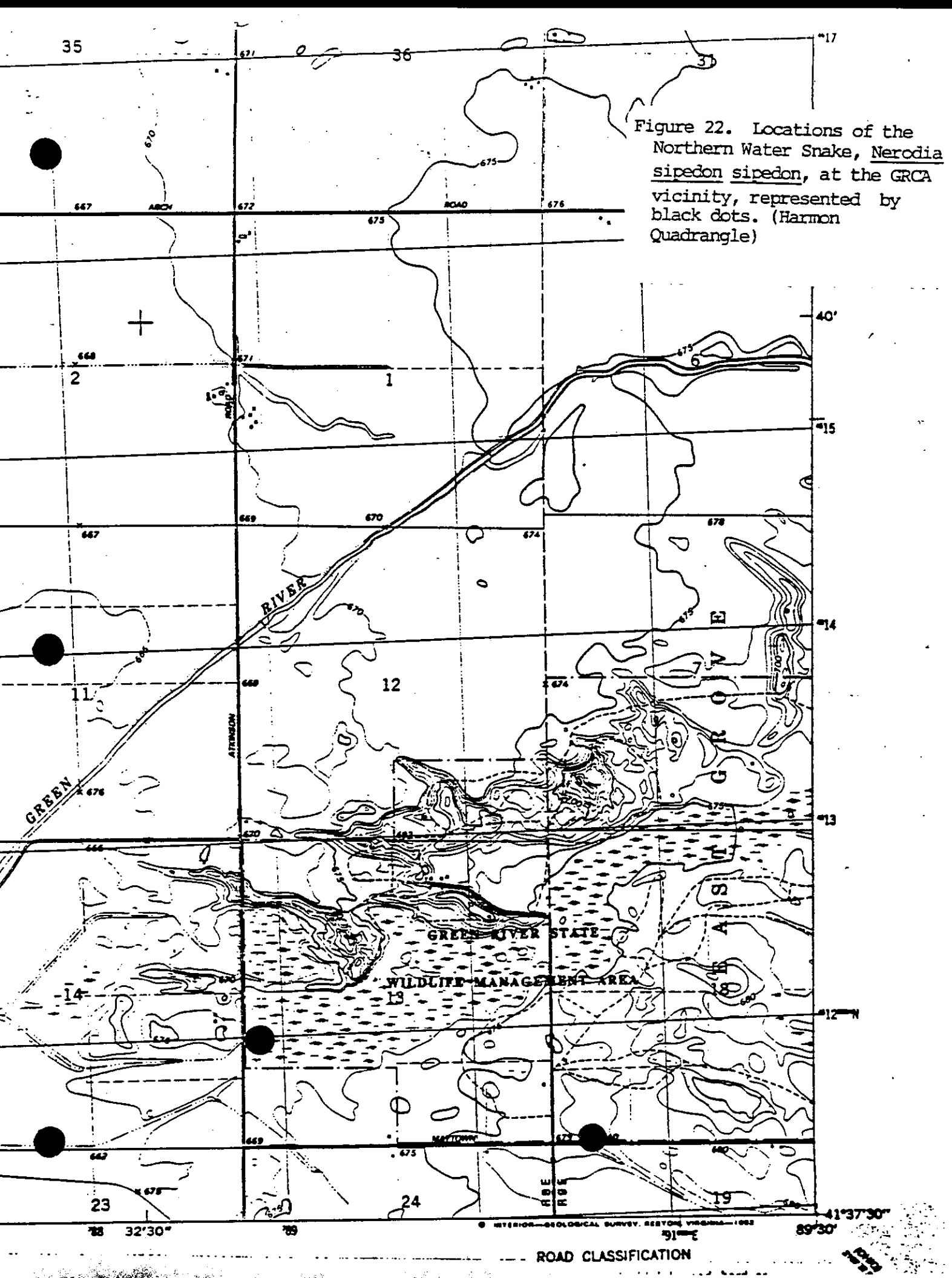


Figure 22. Locations of the Northern Water Snake, Nerodia sipedon sipedon, at the GRCA vicinity, represented by black dots. (Harmon Quadrangle)

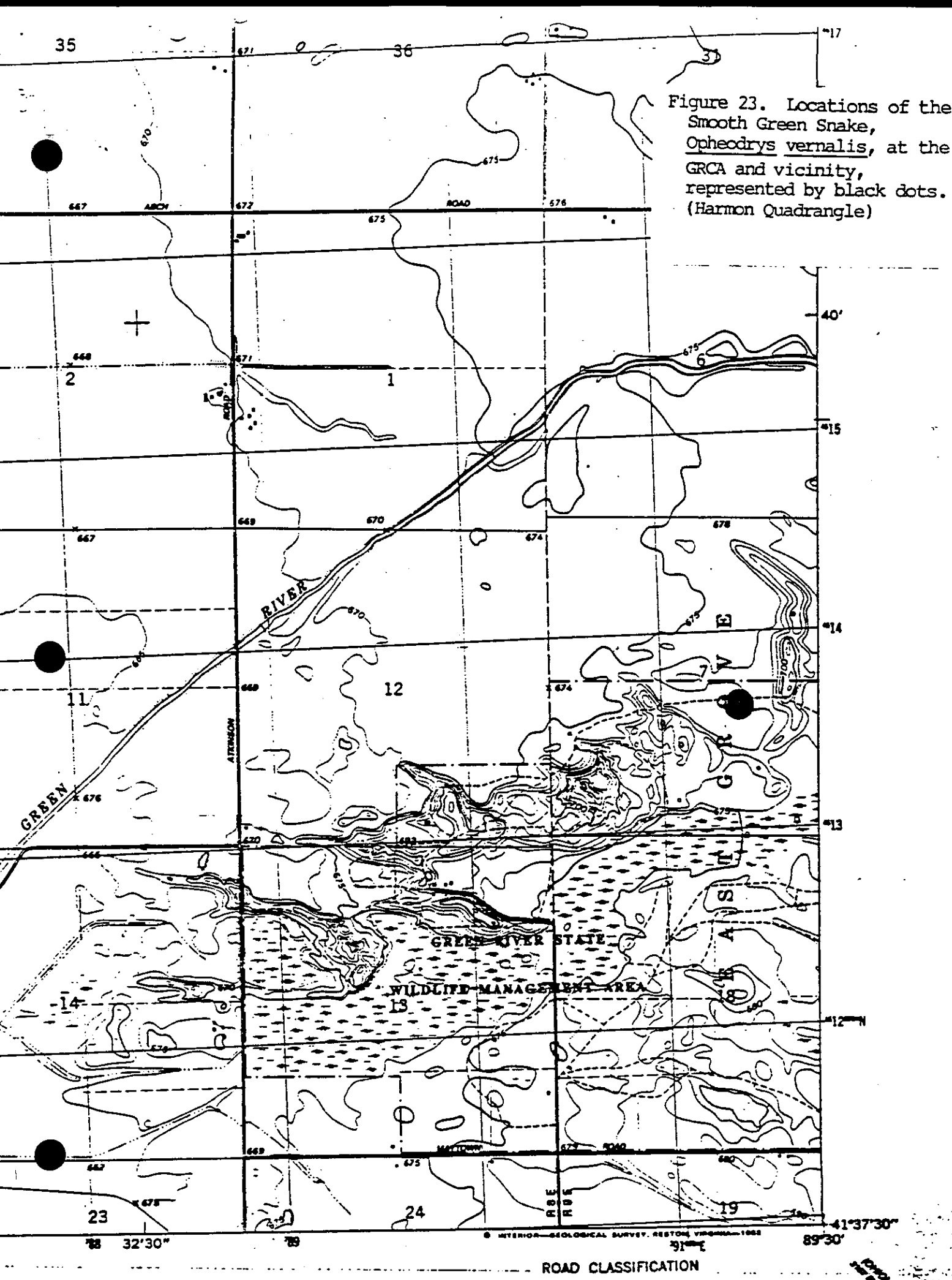


Figure 23. Locations of the Smooth Green Snake, Opheodrys vernalis, at the GRCA and vicinity, represented by black dots. (Harmon Quadrangle)

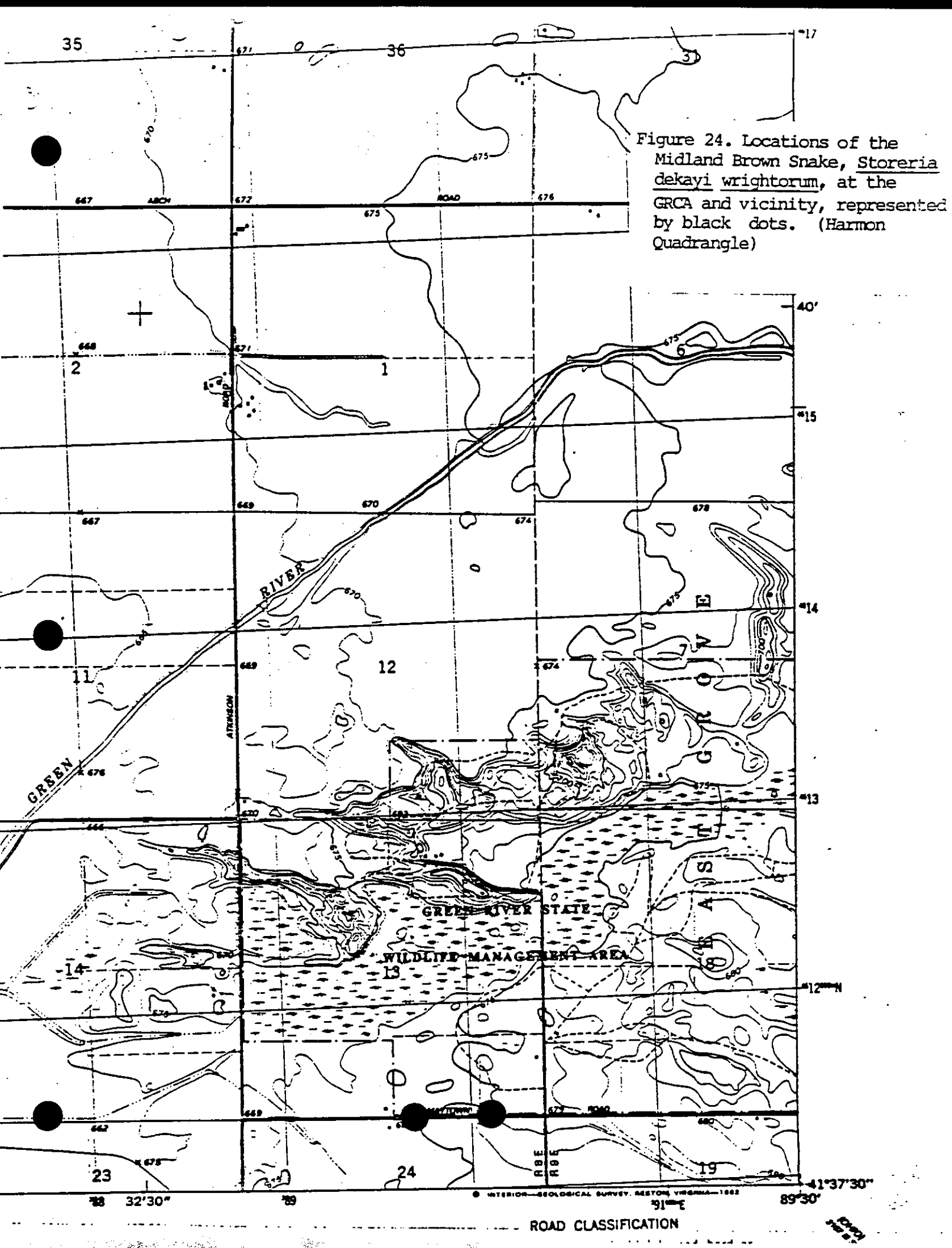


Figure 24. Locations of the Midland Brown Snake, Storeria dekayi wrightorum, at the GRCA and vicinity, represented by black dots. (Harmon Quadrangle)

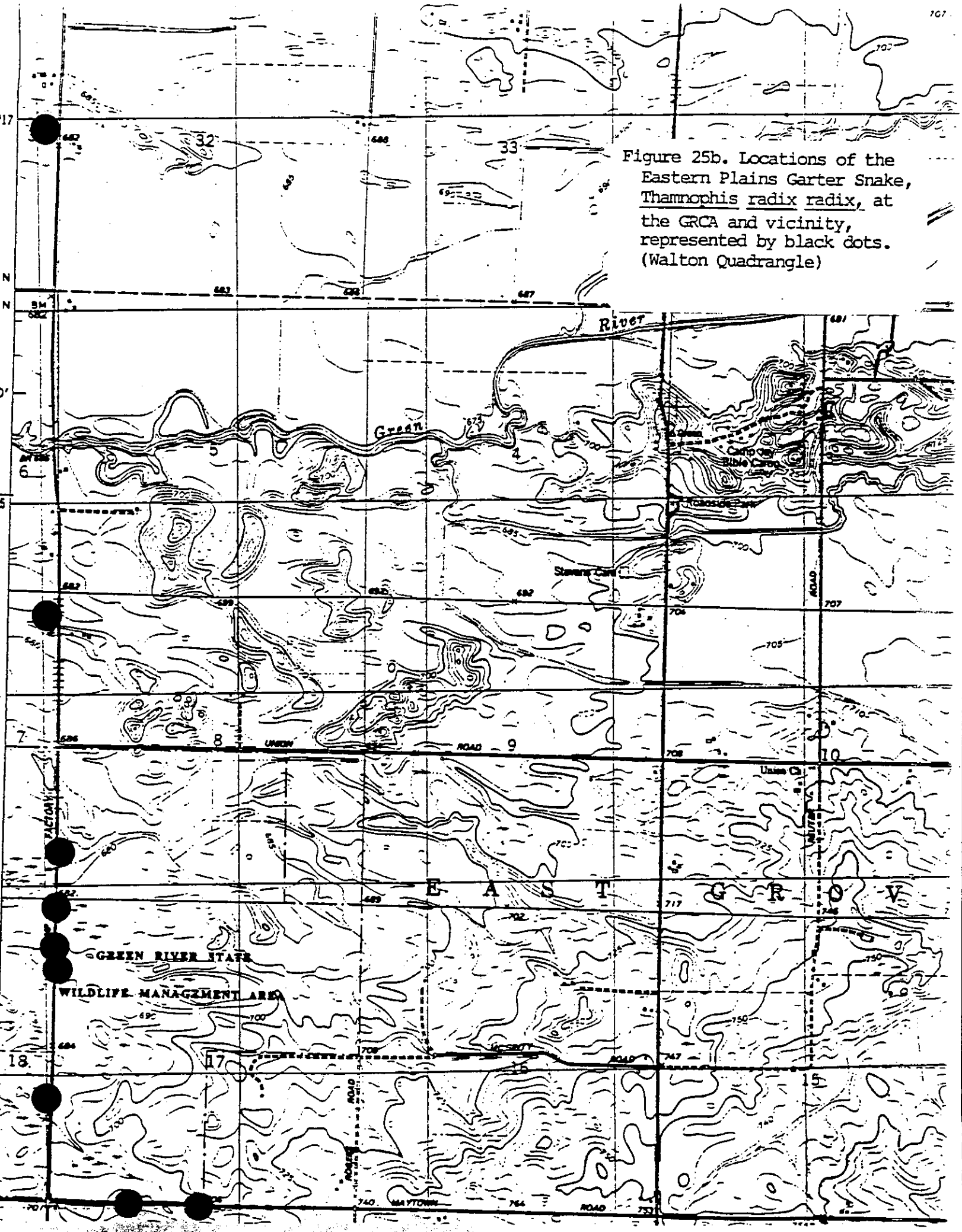


Figure 25b. Locations of the Eastern Plains Garter Snake, Thamnophis radix radix, at the GRCA and vicinity, represented by black dots. (Walton Quadrangle)

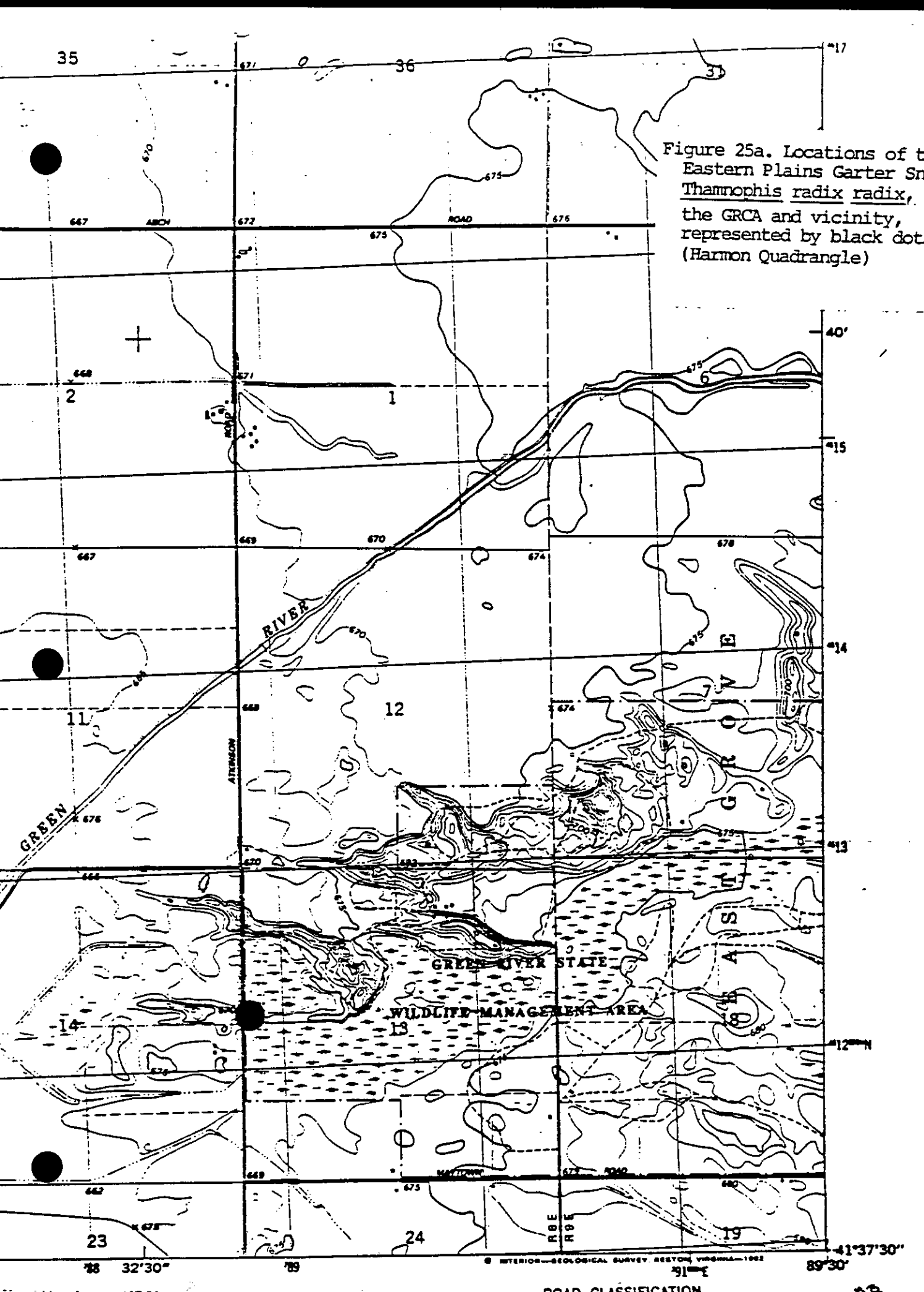


Figure 25a. Locations of the Eastern Plains Garter Snake, Thamnophis radix radix, at the GRCA and vicinity, represented by black dots. (Harmon Quadrangle)

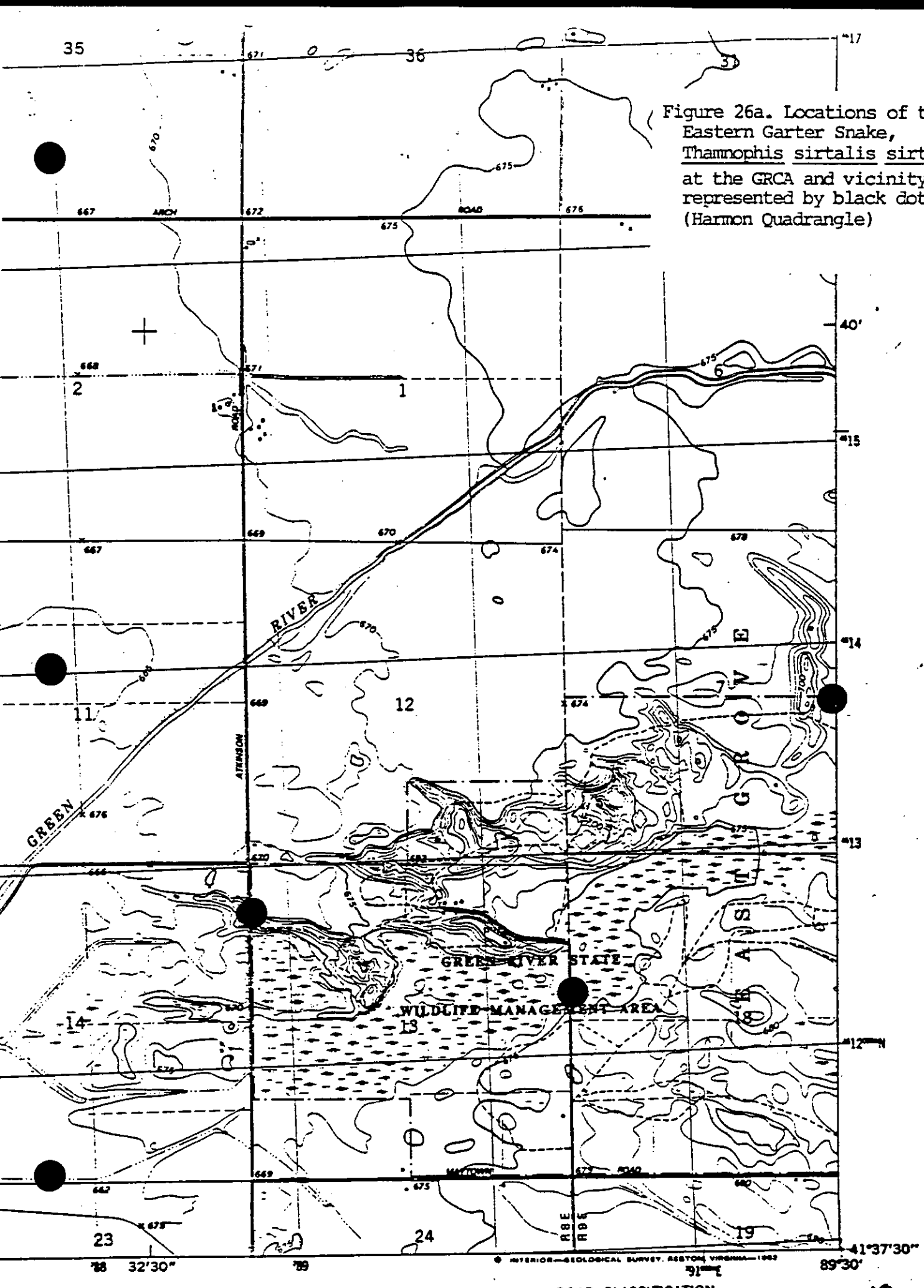


Figure 26a. Locations of the Eastern Garter Snake, Thamnophis sirtalis sirtalis, at the GRCA and vicinity, represented by black dots. (Harmon Quadrangle)

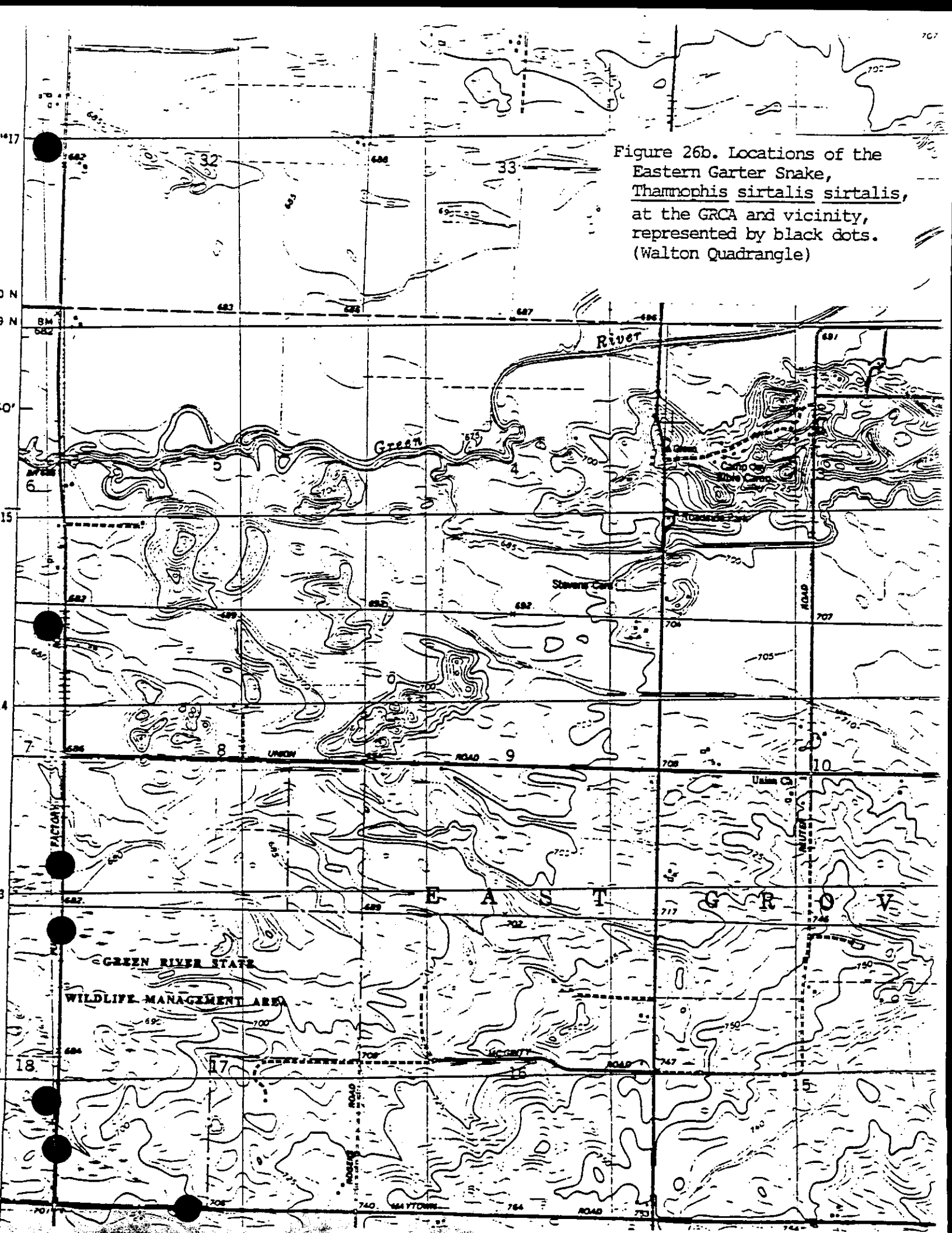


Figure 26b. Locations of the Eastern Garter Snake, Thamnophis sirtalis sirtalis, at the GRCA and vicinity, represented by black dots. (Walton Quadrangle)

PART V

HERPETOFAUNA OF FIVE NW ILLINOIS STATE PARKS

A PRELIMINARY REPORT ON THE AMPHIBIANS AND REPTILES OF FIVE STATE PARKS IN NORTHWESTERN ILLINOIS.

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August 12, 1991

In 1990 and 1991, cursory surveys of amphibians and reptiles were done at five state parks in northwestern Illinois (Fig. 1). The parks visited were: Apple River Canyon Sate Park (Jo Daviess County), Castle Rock State Park, White Pines Forest State Park (both in Ogle County), Franklin Creek State Park (Lee County), and Lake Le-Aqua-Na State Park (Stephenson County). Apple River Canyon State Park is located in the Wisconsin Driftless (unglaciated) Natural Division (Schwegman, et al. 1973); the other four state parks treated by this report are entirely within the Rock River Hill Country Division. Several unique amphibian and reptile habitats are present at each of these sites, and all are similar by having one or more high quality streams and extensive forests within their boundaries. Three amphibian species (Four-Toed salamander, Hemidactylium scutatum; Pickerel Frog, Rana palustris; Wood Frog, Rana sylvatica) with restricted distributions in Illinois have been reported from this portion of the state. The occurrence of some common Illinois amphibian and reptile species is also poorly documented in northwestern Illinois.

The purpose of this report is to present preliminary lists of the amphibians and reptiles of the five surveyed state parks, and to call attention to the need for more extensive species inventories on the remaining natural areas of northwest Illinois.

STUDY AREAS, METHODS AND RESULTS

The following accounts give brief descriptions of the habitats at the five state parks visited during this survey, as well as summarize dates visited, sampling types used, and numbers of amphibian and reptile species encountered.

Apple River Canyon State Park (ARCSP). This 297 acre state park is located approximately 7 km south of the Town of Apple River. ARCSP consists of three portions, all of which are within the United States Geological Survey (USGS) 7.5 minute, Elizabeth NE Quadrangle (T 28 N, R 4 E; Fig. 2). The first, and largest, of these portions is situated around the confluence of the North and South Forks of the Apple River

(secs. 4 and 9); two smaller and separate portions (in secs. 8 and 17) are located on the Apple River, 1 - 2.5 km downstream.

The most striking feature of ARCSP are the massive dolomite-sandstone bluffs cut by the Apple River. The Apple River is swift and rocky throughout most of the park; it was rated by Smith (1971) to be a "good to excellent" stream. Evers and Page (1977) reported the diciduous forest here to consisit of such trees as White Oak, Northern Red Oak, Hill's Oak, Basswoood, Hop Hornbeam and Rock Elm. Among the interesting amphibians and reptiles previously known from this site are the Pickerel Frog, Rana palustris (Smith, 1961) and Timber Rattlesnake, Crotalus horridus (Smith, 1961; Evers and Page, 1977).

ARCSP was visted on 2 June, 1990, and on 31 May, 1991. The North fork, South Fork and main channel of the Apple River were walked for short distances near the main picnic areas and campgrounds. The grassy margins of these streams were searched for amphibians and reptiles. Specimens were captured by hand. Four amphibian and three reptile species were found at ARCSP during these visits (Table 1).

Castle Rock State Park (CRSP). Approximately 2000 acres in size, CRSP is located roughly 4 km south of Oregon, Illinois, and 3.5 km north of Grand Detour, Illinois. The eastern boundary of CRSP is formed by the Rock River. The park is situated within sec. 17, T 23 N, R 10 E, of the USGS Daysville Quadrangle, and within all or portions of secs. 18, 19, and 30, T 23 N, R 10 E, and secs. 24 and 25, T 23 N, R 9 E, of the Grand Detour Quadrangle (Figs. 3-4).

Most of the park is dominated by deep sandstone ravines cut by a number of ephemeral to semipermanent spring runs and brooks. The forest at CRSP is mature and extensive. White Oak, Northern Red Oak, Black Oak, Hickory, Basswoods, Aspens and Maples are common throughout various stages of the slopes in the park. CRSP is well known for the diversity of fern species living within its boundaries. Several open meadows of different sizes are found in the park, and support small prairie remnants which grade into Cedar Glades and other successional woodlnds. The rare Four-Toed Salamander (Hemidactylium scutatum) was reported from CRSP by Lynch (1965).

CRSP was visited on 4 May, and 5 and 22 June, 1991. Most of field work here consisted of cover turning in or near several wooded ravines in the northern and central portions of the park. Turtles basking on logs in the Rock River were identified with binoculars. Four species of amphibians and three reptiles were identified in CRSP and its immediate vicinity (Table 2).

Franklin Creek State Park (FCSP). Also known as Franklin Creek State Natural area, this 515 acre state park is located approximately 1.5 km northwest of Franklin Grove. FCSP is within all, or portions of secs. 2 & 3, T 22 N, R 10 E, and secs. 27, 28, 33 and 34, T 23 N, R 10 E, of the USGS Franklin Grove Quadrangle (Fig. 5). The boundaries of this park are roughly follow Franklin Creek, which meanders in a northwesterly direction towards the Rock River.

Throughout FCSP, the creek is gravelly to rocky, and moderately fast flowing at most times. Above the course of Franklin Creek are fairly high, rocky bluffs which form an ecologically diverse valley. Exposed slopes of New Richmond Sandstone, sandy dolomite of the Shakopee formation, and St. Peter Sandstone (all of the Lower to Middle Ordovician age), are among the oldest formations in Illinois. Several springs, and a number of smaller seeps, most with good growths of Skunk Cabbage and Water Kress growing in and around them, are located within two dedicated Illinois Nature Preserves totaling 140 acres of the park's area. The forest in FCSP has a number of interesting trees, including Slippery Elm, Kentucky Coffee Tree, Hackberry, and Maples in the bottomland, and Paw Paw on the sides of the hills, and dry-mesic forest (White Oak, Red Oak, Hickory and Hop Hornbeam) higher up. A large pond was located between the Mill Springs Day Use Area and Twist Road in the west-central part of FCSP in 1990. At that time, it appeared shallow and weedy; the shoreline had lush sedge and rush growth, and at least two amphibians (the Pickerel Frog, Rana palustris, and Spring Peeper, Pseudacris crucifer) and one reptile (the Western Ribbon Snake, Thamnophis proximus) with sporadic distributions in northern Illinois were known to use this pond. In 1991, this pond was apparently modified and deepened; the surface of the pond was considerably smaller than in 1990. Heavy earth-moving equipment was parked along Twist Road on 6

April, 1991, and some bare soil was still apparent within the former basin of this wet area.

FCSP was visited on 22 and 24 June, in 1990, and on 6 April, 4 and 22 June, in 1991. Several random collecting tecniques were used to assemble preliminary species lists for the site, including: search and seize, turning ground cover, dipnetting, listening for frog vocalizations and road cruising.

Seven amphibian and six reptile species were collected or noted from FCSP (Table 3), including several uncommon in this portion of Illinois, or not previously reported from Lee County.
Calling dates and chorus sizes were collected for seven species of frogs at FCSP in 1991. A Smooth Green Snake, Opheodrys vernalis, collected at FCSP on 22 June, 1991, deposited five eggs on 26 June, 1991.

Lake Le-Aqua-Na State Park (LANSP). Also known as Le-Aqua-Na State Park, this 715 acre area lies 5.5 km northwest of Lena, in Stephenson County. LANSP is located within all or portions of secs. 16, 17, 20, and 21, T 28 N, R 6 E, of the USGS Lena Quadrangle (Fig. 6).

The primary feature of LANSP is Lake Le-Aqua-Na, a forty acre impoundment lake fed by Waddams Creek. Waddams Creek flows downstream approximately .7 km from the dam of Lake Le-Aqua-Na before leaving the park; upstream from the point at which the creek enters the lake, it flows approximately .9 km from the point at which it enters the park. Throughout its unimpounded sections within LANSP, Waddams Creek is clear, gravelly and fast flowing. The Brook Stickleback (Culaea inconstans), a fish with a Illinois distribution limited to the northern counties, is abundant in Waddams Creek at LANSP. In the northwestern portion of the park, the creek lies within a fairly deep, well shaded ravine. An extensive forest grows in the bottomland, as well as on the sides and tops of of the ravine solopes. Unfortunately, a large tract of planted pines occupies an area just north of this portion of the Waddams Creek Ravine, and strectches across much of the northern half of the park. In the southeast portion of LANSP, Waddams Creek flows through a hilly area as well as through several low fenss before leaving the park. The lake, and areas immediately surrounding it, are managed for actve recreational use.

LANSP was visited on 2 June, 1990, and on 31 May and 28 July, 1991. Ground cover was turned in wooded areas and along the margins of Waddams Creek; frog vocalizations were listened for and basking turtles were captured with dip nets or identified with binoculars. Five amphibian and four reptile species were observed or collected at LANSP during this study (Table 4).

White Pines Forest State Park (WPFSP). This small state park in Ogle County is located approximately 1.5 km east of Stratford and 18 km north of Dixon (Lee County). WPFSP lies within portions of secs. 8 and 9, T 23 N, R 9 E, of the USGS Grand Detour Quadrangle (Fig. 7).

Pine Creek is the most obvious feature of WPFSP. This is a large, fast flowing and rocky creek. The margins of the creek have large sections of Reed Canary Grass and Thistle growing along them, as well as several mowed or rip-rapped stretches. A small tributary of Pine Creek originates in a deep ravine at the northwest corner of the park. This ravine is heavily wooded with Basswoods, Maples and Oaks. Several smaller spring runs and a number of seeps originating on the sides of the ravine feed the tributary. WPFSP contains one of the only remaining natural stands of White Pines in Illinois.

WPFSP was visited on 22 and 24 June, 17 July, and 1 November, 1990, and on 19 May, 22 June, and 14 July, 1991. Margins of Pine Creek, and the small tributary described above were walked; ground cover here and on the wooded hillsides was turned to reveal hiding animals. Specimens were captured by hand or with a dip net. Five amphibian and three reptile species were collected or noted at WPFSP during this survey (Table 5).

DISCUSSION

White (1978) determined that the Rock River Hill Country and Wisconsin Driftless Natural Divisions collectively contain 10 % of the natural areas remaining in Illinois. Despite this, and Smith's (1961: 77) statement that "there has been considerable collecting in northwestern Illinois, and adjacent Iowa," this region has remained incompletely surveyed for amphibians and reptiles. Several species of amphibians and

reptiles uncommon or having limited distributions in Illinois have been reported from this portion of the state, although most of these have been recorded from only one or a few localities here.

Species with primarily southern distributions in Illinois range into northwestern Illinois (Smith and Minton, 1957; Smith, 1961) but the limits of their ranges and relative abundance here has not yet been thouroughly determined. These species include: the Red-Eared Slider, Trachemys scripta elegans, the Smooth Softshell Turtle, Apalone mutica, Black Rat Snake, Elaphe obsoleta, and Timber Rattlesnake, Croatlus horridus.

Several eastern species have also been poorly documented in northwestern Illinois, including: the Spotted Salamander, Ambystoma maculatum, Central Newt, Notopthalmus viridescens louisianensis, Spring Peeper, Pseudacris crucifer, Wood Frog, Rana sylvatica, Ringneck Snake, Diadophis punctatus, and Queen Snake, Regina septemvittata.

At least two species with limited Illinois distributions have been reported from Illinois or Wisconsin Counties adjacent to those covered by this report. The Blue-Spotted Salamander, Ambystoma laterale, has been reported from Winnebago County, Illinois (Olson, 1956; Smith, 1961; Mierzwa, 1987) and from Grant County, Wisconsin (Vogt, 1981). The Western Worm Snake, Carphophis vermis, is known from Grant County, Wisconsin (Vogt, 1981), as well as from southeast Iowa (Conant and Collins, 1991). The occurence of neither species in northwestern Illinois would be suprising; however, verification of these species here could nonetheless add significantly to our knowledge of this region's herpetofauna.

Due largely to a lack of collecting in the region, some species (e.g. Bullfrog, Rana catesbeiana; Snapping Turtle, Chelydra serpentina; Milk Snake, Lampropeltis triangulum; DeKay's Snake, Storeria dekayi) considered by Smith (1961) to be statewide in occurrence, or known to be common in adjacent portions of Illinois, have not yet been documented from large portions of the northwestern section of the state. Since the publication of Smith's book, over thirty species distributional records have been gathered, for some northwest Illinois counties, though vouchers have not yet been collected for each. Most of these records

have been accumulated since 1986 (Mierzwa, 1988; Redmer, 1991a [unpublished], b [this report]), and are yet unpublished.

In the course of other fieid work done in this portion of the state since Smith's book, valuable distribution and life history data has been accumulated for only a few uncommon species there. Lynch (1965) reported the first relictual population of the Four-Toed Salamander (Hemidactylium scutatum) from the interior of Illinois to occur at CRSP, in Ogle County, and gave detailed descriptions of the plant communities it was associated with. Thurow and Slowinski (1991) reported H. scutatum from northwestern Rock Island County, but gave no more specific locality data or natural history information. Anton and Redmer (1991) and Redmer (this report) have recorded the second and third known collections of the Queen Snake (Regina septemvittata) from the Rock River Drainage at FCSP and WPFSP. Redmer and Mierzwa (in preparation) will report on the distribution, zoogeography, and natural history of the Pickerel Frog (Rana palustris) in northern Illinois, including the northwestern portion.

Because of the lack lack of past field work in northwestern Illinois, as well as the need to increase our knowledge of the distributions and natural histories of many of the amphibian and reptile species occurring in northwestern Illinois, further and more thorough inventories there should be encouraged. Such inventories should include natural areas (e.g. Hanover Bluffs Nature Preserve, in JoDaviess County; Mississippi Palasades State Park, in Carroll County; Morrison-Rockwood State Park, in Whiteside County) not covered by this report as well.

ACKNOWLEDGEMENTS

I am grateful for the assistance with field work given by the following individuals: Thomas G. Anton, Mark Bavetz, Dr. Ronald A. Brandon, Doug Carrol, Robert Flick and Kenneth S. Mierzwa, and to T. G. Anton and R. A. Brandon for helpful comments and encouragement regarding this report.

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Table 1. Amphibian and reptile species collected or noted at Apple River Canyon State Park during this survey.

Common Name	Scientific Name
Amphibians	Class Amphibia
Frogs and Toads	Order Anura
Eastern American Toad [1]	*Bufo americanus americanus*
Bullfrog [3,4]	*Rana catesbeiana*
Green Frog [3,4]	*Rana clamitans melanota*
Pickerel Frog [1]	*Rana palustris*
Reptiles	Class Reptilia
Turtles	Order Tedtudines
Common Snapping Turtle [2]	*Chelydra serpentina*
Snakes	Order Squamata; suborder serpentes
Northern Water Snake [2]	*Nerodia sipedon sipedon*
Eastern Garter Snake [4]	*Thamnophis sirtalis*

1 Voucher specimen collected
2 Photographic voucher taken
3 Species identified by breeding call (frogs and toads)
4 No voucher taken

Table 2. Amphibian and reptile species collected or noted at Castle Rock State Park during this survey.

Common Name	Scientific Name
Amphibians	Class Amphibia
Frogs and Toads	Order Anura
Spring Peeper [2]	*Pseudacris crucifer*
Western Chorus Frog [2]	*Pseudacris triseriata*
Bullfrog [1]	*Rana catesbeiana*
Green Frog [1]	*Rana clamitans melanota*
Reptiles	Class Reptilia
Turtles	Order Testudines
Painted Turtle [1]	*Chrysemys picta* ssp.
Spiney Softshell Turtle [1]	*Apalone spinifera*
Snakes	Order Squamata; suborder serpentes
Northern Water Snake [1]	*Nerodia sipedon sipedon*

1 Observed, no voucher taken
2 Species identified by breeding call (frogs and toads)

Table 3. Amphibian and reptile species collected or noted at Franklin Creek State Park during this survey.

Common Name	Scientific Name
Amphibians	Class Amphibia
Frogs and Toads	Order Anura
Eastern American Toad [1,3]	*Bufo americanus americanus*
Cope's Gray Treefrog [3,4]	*Hyla chrysoscelis*
Spring Peeper [1,3]	*Pseudacris crucifer*
Western Chorus Frog [1,3]	*Pseudacris triseriata*
Bullfrog [1]	*Rana catesbeiana*
Green Frog [1,3]	*Rana clamitans melanota*
Pickerel Frog [1,3]	*Rana palustris*
Northern Leopard Frog [1,3]	*Rana pipiens*
Reptiles	Class Reptilia
Snakes	Order Squamata; suborder serpentes
Northern Water Snake [4]	*Nerodia sipedon sipedon*
Smooth Green Snake [1]	*Opheodrys vernalis*
Queen Snake [1,2]	*Regina septemvittata*
Midland Brown, or DeKay's Snake [1]	*Storeria dekayi wrightorum*
Western Ribbon Snake [4]	*Thamnophis proximus*

1 Voucher specimen collected
2 Photographic voucher taken
3 Species identified by breeding call (frogs and toads)
4 No voucher taken

Table 4. Amphibian and reptile species collected or noted at Lake Le-Aqua-Na State Park during this survey.

Common Name	Scientific Name
Amphibians	Class Amphibia
Frogs and Toads	Order Anura
Eastern American Toad [1]	*Bufo americanus americanus*
Eastern Gray Treefrog [2,3]	*Hyla versicolor*
Bullfrog [2,3]	*Rana catesbeiana*
Green Frog [1]	*Rana clamitans melanota*
Pickerel Frog [1]	*Rana palustris*
Northern Leopard Frog [3]	*Rana pipiens*
Reptiles	Class Reptilia
Turtle	Order Testudines
Common Snapping Turtle [1]	*Chelydra serpentina*
Painted Turtle [1]	*Chrysemys picta* ssp.
Snakes	Order Squamata; suborder serpentes
Northern Water Snake [3]	*Nerodia sipedon sipedon*
Eastern Garter Snake [1]	*Thamnphis sirtalis*

1 Voucher Specimen collected
2 Species identified by breeding call (frogs and toads)
3 No voucher taken

Table 5. Amphibian and reptile species collected or noted at White Pines Forest State Park[1]

Common Name	Scientific Name
Amphibians	Class Amphibia
Frogs and Toads	Order Anura
Eastern American Toad [1]	*Bufo americanus americanus*
Bullfrog [2,3]	*Rana catesbeiana*
Green Frog [1]	*Rana clamitans melanota*
Pickerel Frog [3]	*Rana palustris*
Northern Leopard Frog [1]	*Rana pipiens*
Reptiles	Class Reptilia
Turtles	Order Testudines
Common Snapping Turtle [3]	*Chelydra serpentina*
Northern Water Snake [1]	*Nerodia sipedon sipedon*
Queen Snake [1]	*Regina septemvittata*

1 Voucher specimen collected
2 Species identified by breeding call (frogs and toads)
3 No voucher taken

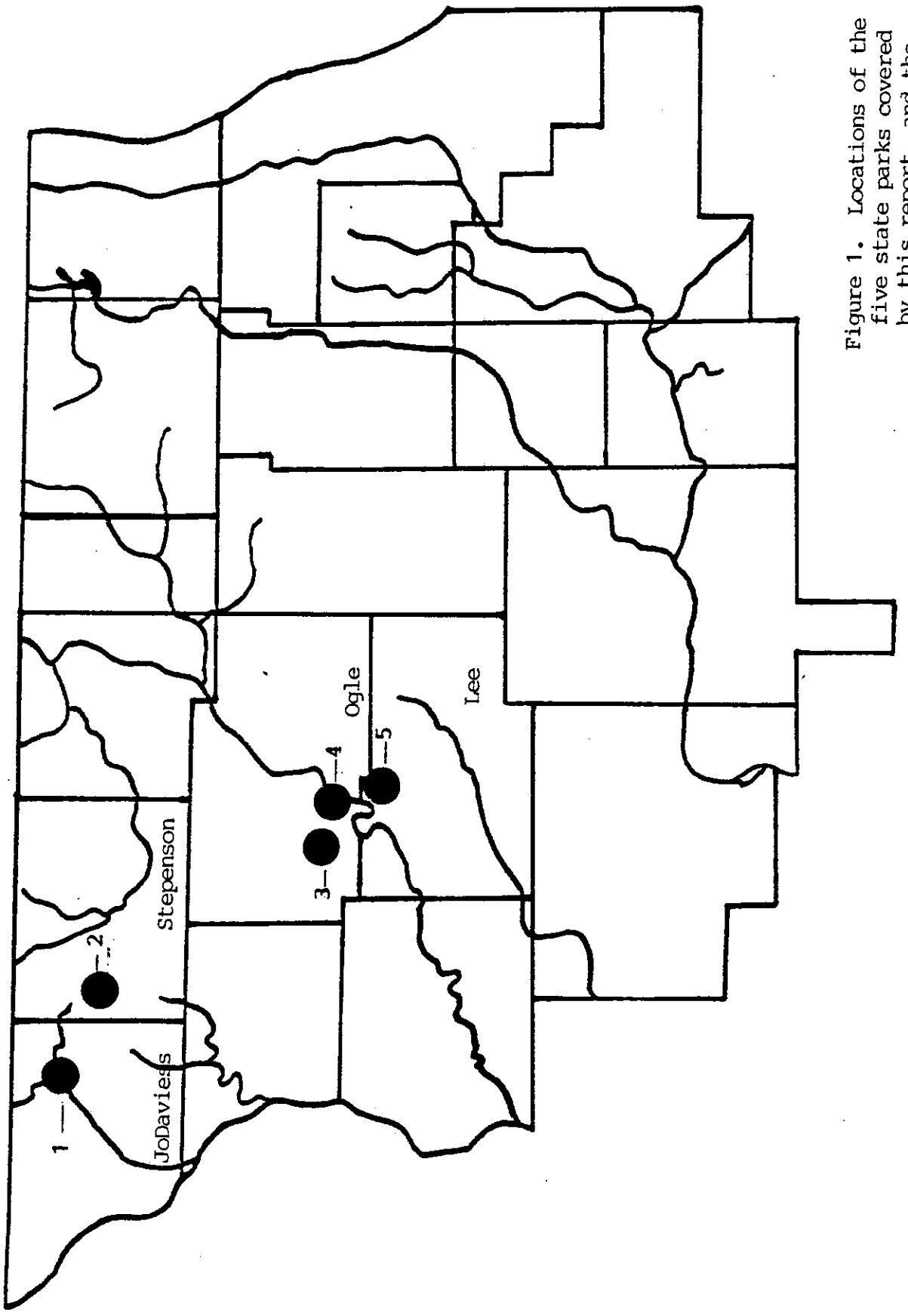

Figure 1. Locations of the five state parks covered by this report, and the counties they are located in. 1=Apple River Canyon, 2=Le-Aqua-Na, 3= White Pines Forest, 4= Castle Rock, 5= Franklin Creek.

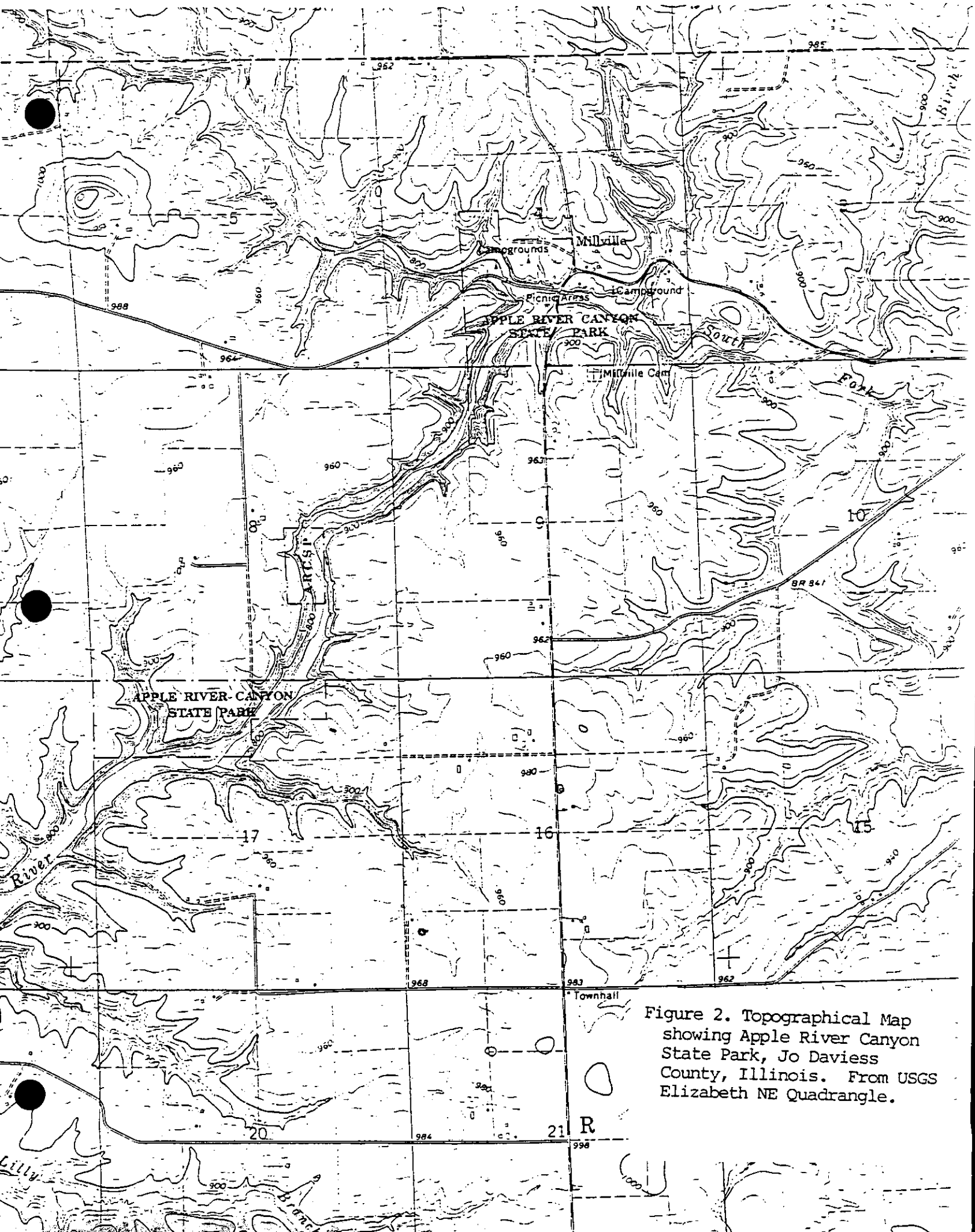

Figure 2. Topographical Map showing Apple River Canyon State Park, Jo Daviess County, Illinois. From USGS Elizabeth NE Quadrangle.

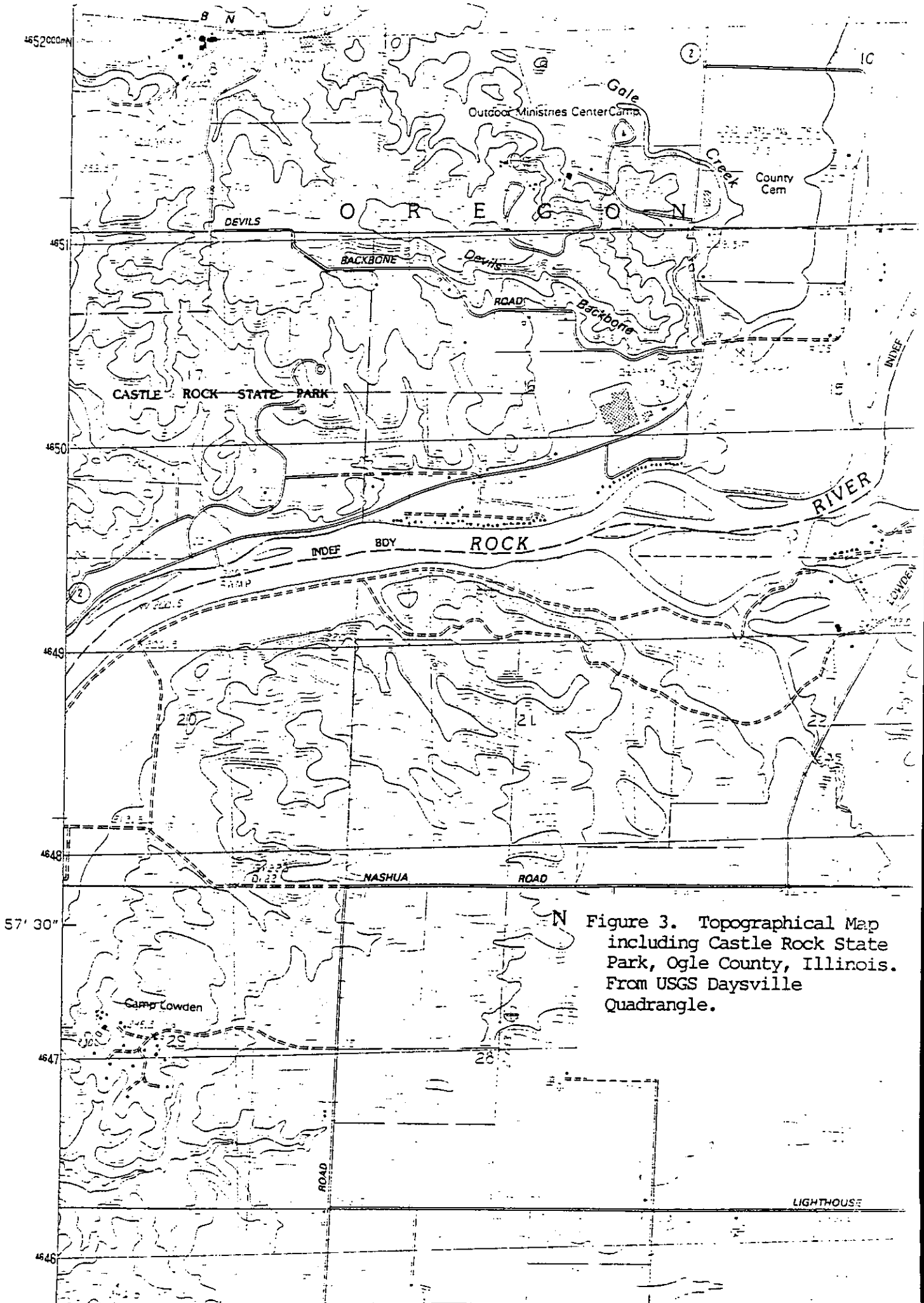

Figure 3. Topographical Map including Castle Rock State Park, Ogle County, Illinois. From USGS Daysville Quadrangle.

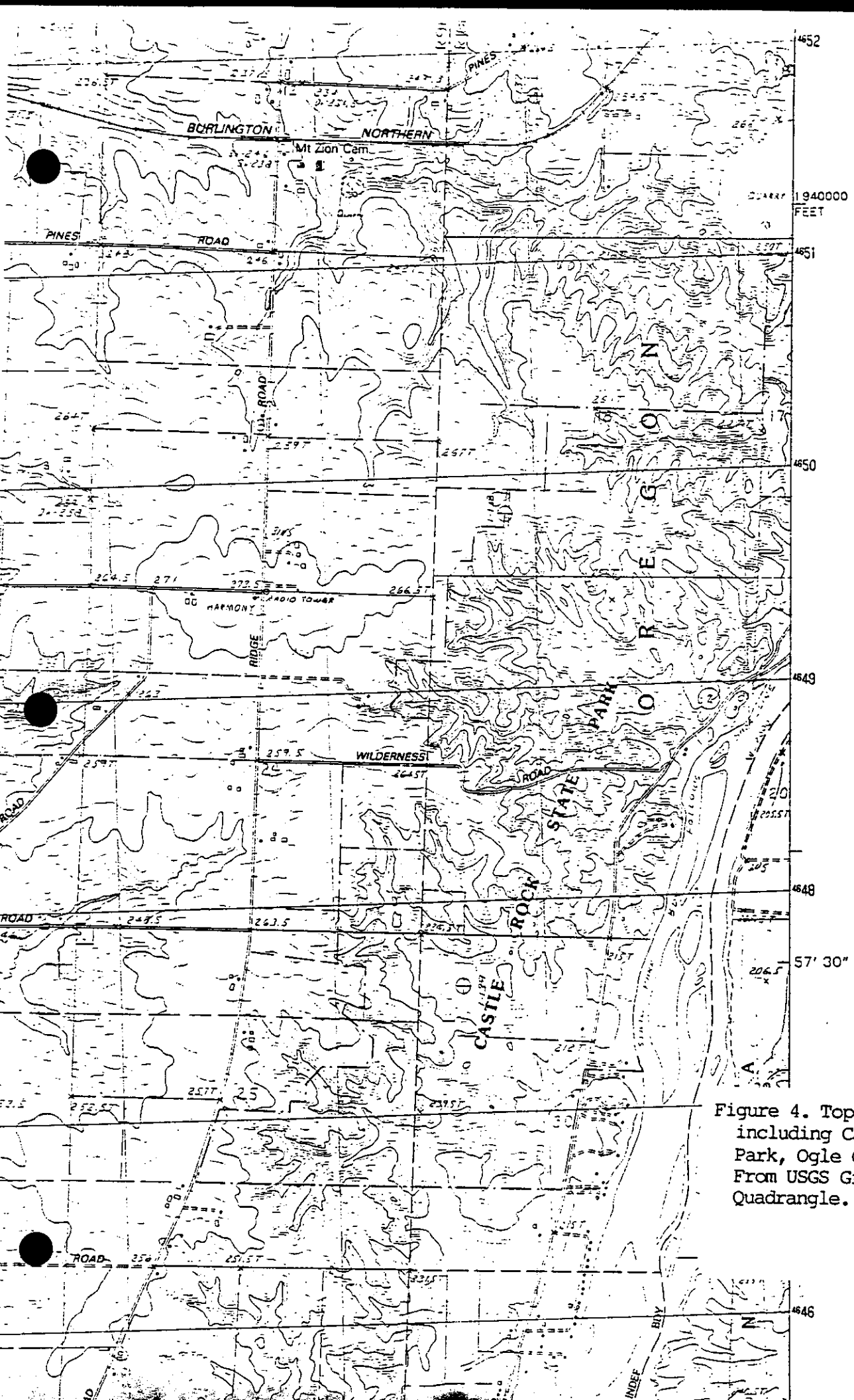

Figure 4. Topographical Map including Castle Rock State Park, Ogle County, Illinois. From USGS Grand Detour Quadrangle.

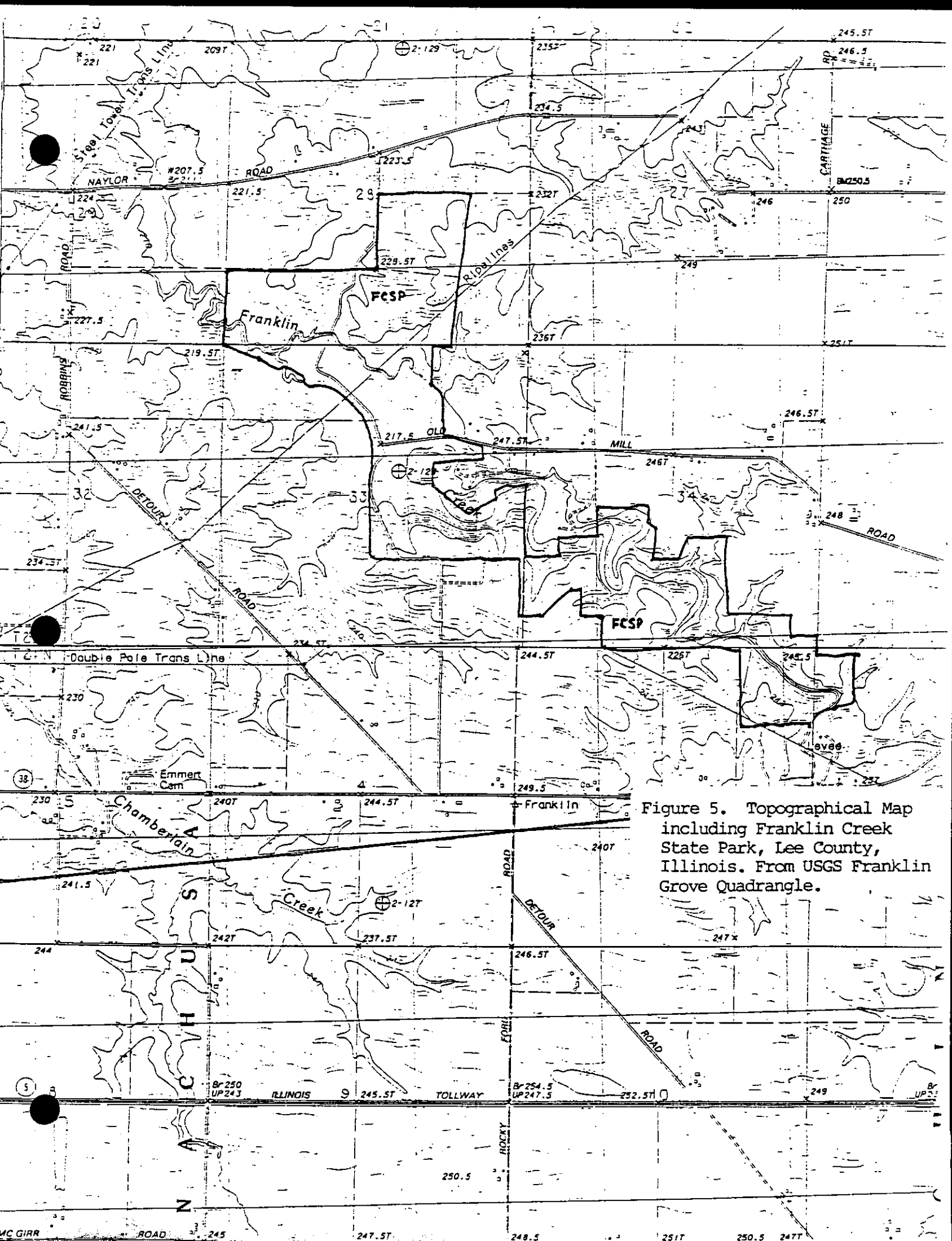

Figure 5. Topographical Map including Franklin Creek State Park, Lee County, Illinois. From USGS Franklin Grove Quadrangle.

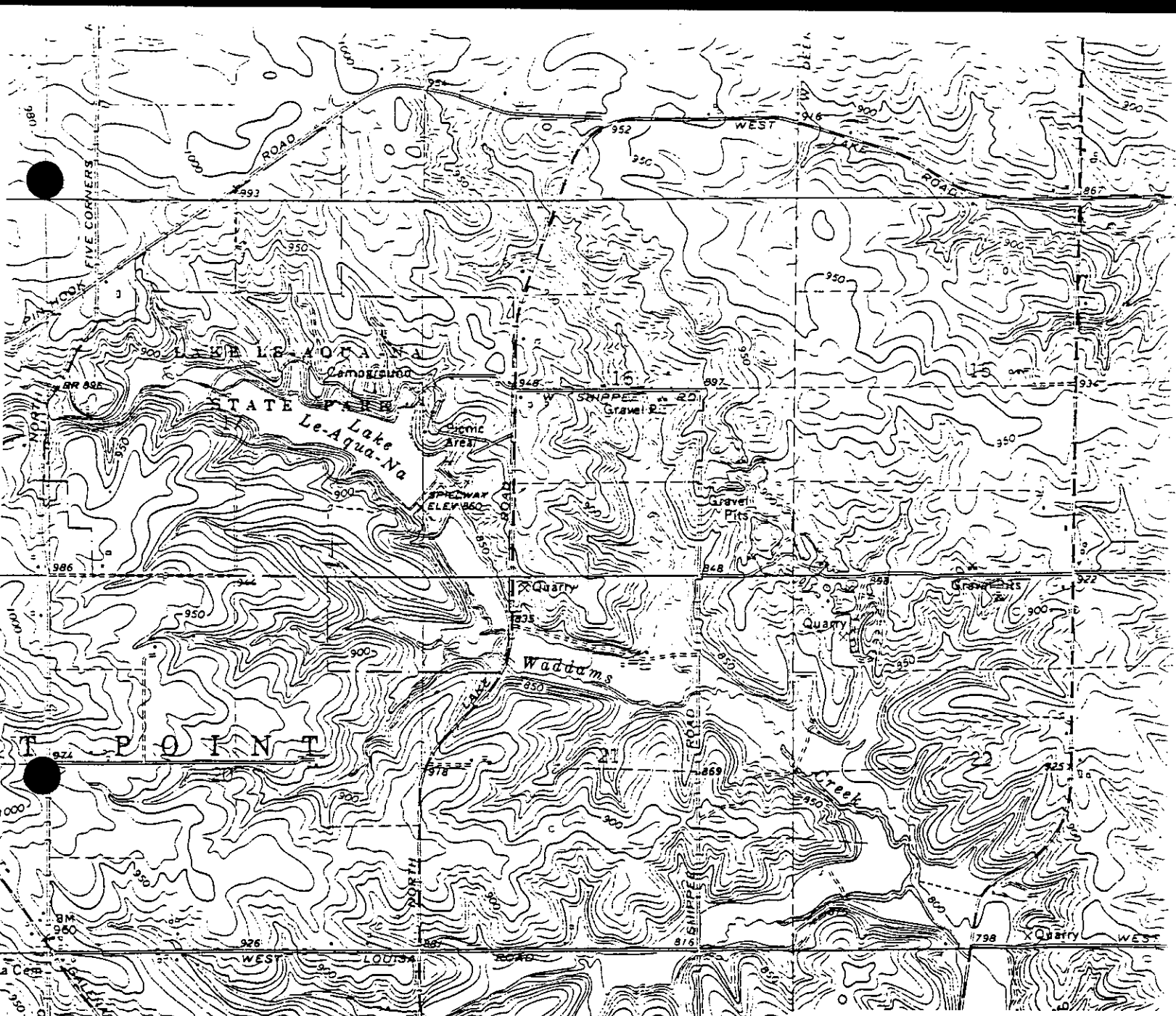

Figure 6. Topographical Map including Lake Le-Aqua-Na State Park, Stephenson County, Illinois. From USGS Lena Quadrangle.

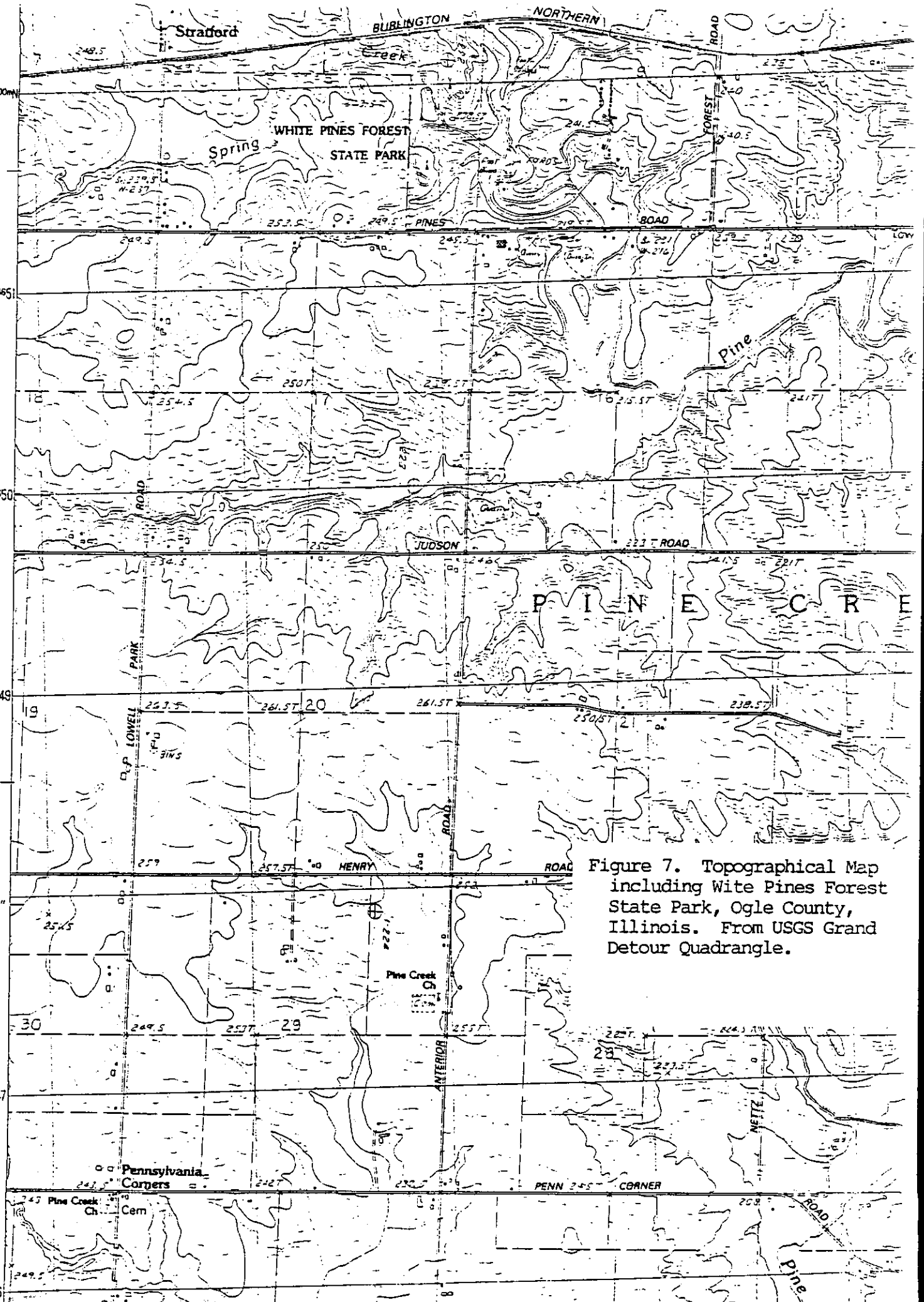

Figure 7. Topographical Map including Wite Pines Forest State Park, Ogle County, Illinois. From USGS Grand Detour Quadrangle.