

FINAL REPORT
SECTION 6
ENDANGERED SPECIES ACT



FEDERAL AID PROJECT E-39
Black-capped Vireo Survey on Public Land in Central Oklahoma

SEPTEMBER 18, 1995 - SEPTEMBER 30, 1996

FINAL PERFORMANCE REPORT

STATE: Oklahoma

GRANT NUMBER: E-39

GRANT TYPE: Research

GRANT TITLE: Black-capped Vireo Public Land Survey

SEGMENT DATES: 18 September 1995 - 30 September 1996

PROJECT TITLE: Black-capped Vireo Survey on Public Land in Central Oklahoma

I. OBJECTIVES:

- 1) Conduct surveys on Canton and Lexington wildlife management areas, and possibly other public lands nearby, to determine the presence of Black-capped Vireos and/or their habitat.
- 2) Collect data to determine whether breeding activity is taking place.

II. ABSTRACT:

Surveys were conducted at three sites to determine whether breeding populations of Black-capped Vireos were present. Two of the areas chosen for the survey, Canton Wildlife Management Area and Lexington Public Hunting Area, are publicly held lands within the same county as two of the known Black-capped Vireo populations remaining in Oklahoma. The third site is a tract of private property which was occupied by Black-capped Vireos as recently as 1986, but has not been monitored in recent years. During the vireo surveys, all bird species seen or heard were recorded. No Black-capped Vireos were found at any of these sites. Canton Wildlife Management Area appears to have relatively little suitable habitat for Black-capped Vireos. We recommend additional survey effort next May on Lexington Public Hunting Area. Though no Black-capped Vireos were found, Lexington PHA does have scattered patches of habitat which appear suitable for nesting vireos. The U.S. Fish and Wildlife Service is working with the landowner on the private property site to restore the historic structure of the oak-dominated habitat through the removal of invading eastern red cedar. We recommend that this site be monitored annually in the event that undetected vireos are present or the site is recolonized by Black-capped Vireos.

III. PROCEDURES:

Historical information regarding the distribution of the Black-capped Vireo in Oklahoma is scarce, however, the general consensus of biologist working with this species is that this vireo was locally common earlier in this century in disjunct tracks of suitable habitat in central Oklahoma. Counties of known occurrence since 1903 are Comanche, Caddo, Canadian, Blaine, Cleveland, Oklahoma, Payne and Murray (Grzybowski et al 1986). Over the past four decades, the population appears to have declined dramatically range-wide and was listed as federally endangered under the Endangered Species Act in 1987 (Marshall 1985, Ratzlaff 1987).

For purposes of this project, we consider suitable habitat for Black-capped Vireos to be a fine mosaic of oak-dominated, deciduous thickets interspersed with native prairie grasses and forbs. Suitable oak-scrub thickets would range from 1.5 to 4 meters in height and habitat patches of at least 3-4 acres is considered the minimum amount necessary to support a nesting vireo pair. These generalizations are consistent with observations made by Graber (1961) and Grzybowski (1989). Based upon observations in Black-capped Vireo territories in known populations in the Wichita Mountains and the gypsum canyons of Blaine County, the Painted Bunting commonly co-occurs with Black-capped Vireos.

Currently, only three populations of Black-capped Vireos are known to occur in Oklahoma. Approximately 350-400 vireos form a breeding population in the Wichita Mountains NWR and Fort Sill Military Base in Comanche County. A small group of 30-50 vireos occurs in the canyon lands south of Salt Creek in northern Blaine County while a third, even smaller group of fewer than 10 individuals was found recently near Draper Lake in Cleveland County. Relatively large tracts of public land occur within the same counties as the Salt Creek Canyons and Draper Lake populations and these had not previously been searched systematically for Black-capped Vireos. These areas, the Canton Lake Wildlife Management Area and the Lexington Public Hunting Area both contain post/blackjack oak (Quercus stellata and Q. mari-landica) forests and scrub which could provide suitable nesting habitat (Figures 1a-e, 2a-b). A third site, a tract of private land known to be occupied by Black-capped Vireos as recently as 1986, was also surveyed in cooperation with the U.S. Fish and Wildlife Service (Figure 3).

Surveys were conducted using taped-recorded vireo songs to elicit territorial singing behavior from male birds both along roads and while meandering on foot through suitable habitat. At Canton WMA and Lexington PHA, stops were made periodically along boundary and interior roads where suitable habitat occurred. In areas where habitat suitability was questionable, road-side stops were made at approximately 1/2 mile intervals. At each stop, the biologist(s) conducting the survey would listen for and record all

species of birds seen or heard within a 100 meter radius circle of the stop during a three minute period. After this initial three-minute period, tape-recorded Black-capped Vireo songs were played for approximately 45 seconds and all new bird species heard during and for two minutes after the tape were recorded. Individual birds of each species were not tallied for concern that this would detract from our ability to locate singing Black-capped Vireos. Off-road surveys were included in the survey effort on all three survey areas. These consisted of a pair of biologists slowly meandering through suitable habitat on foot and stopping to play a 45-second tape of Black-capped Vireo songs every 4 to 6 minutes. All bird species seen or heard were recorded, though again the number of individuals per species were not recorded except for uncommon species (e.g. Kentucky Warbler). We used this survey technique in relatively large blocks (>20 acres) of suitable habitat, though areas of unsuitable habitat (e.g. creek bottoms) were traversed while moving between seemingly suitable patches.

Surveys on Lexington PHA were conducted by Mark Howery on 11 May 1996, and between 5 June and 10 July 1996. The private land survey was conducted on 10 June 1996 by Noreen Walsh of the USFWS Tulsa Office and Mark Howery. The Canton WMA surveys were conducted by ODWC biologists Mark Howery and Melynda Hickman on 15 May 1996 and 5-6 May 1995. The 1995 surveys were conducted after ODWC received notification that a Section 6 grant had been approved but before a contract was finalized between ODWC and the USFWS.

If Black-capped Vireos were found at any survey site, we attempted to determine whether they were breeding by collecting observational data on territorial behavior and nesting behavior as well as searching for fledged young or nests. Territorial behavior was considered a male singing from the same general location (within 100 meters of the initial sighting) on multiple visits spanning at least two weeks. Nesting behaviors included adults carrying nesting material, food or fecal sacs.

IV. RESULTS AND DISCUSSION:

All areas searched during the vireo surveys are identified on Figures 1a-e, 2a-b and 3. Hatched areas were searched on foot, while black dots represent the approximate locations of point-counts conducted along roads. All birds seen or heard during these surveys are recorded in Tables 1, 2 and 3. No Black-capped Vireos were seen or heard at any of the three areas surveyed. No single factor can be identified to explain the apparent absence of vireos on all areas, but the possible causes are discussed for each area. We would like to point out that much of this information is qualitative and based upon observer impressions. No quantitative data were collected regarding habitat structure, habitat patch size, or cowbird population density.

Canton Wildlife Management Area:

The 16,000 acre Canton Wildlife Management Area contains approximately 10,500 acres of terrestrial habitat comprised of riparian woodland, vegetated (stabilized) dunes, mixed-grass prairie, and post/blackjack oak woodland. Based upon our observations, riparian woodlands and thickets represent the largest habitat type while oak woodland and scrub habitats are restricted to a tract of less than 800 acres on the extreme east side of the WMA (NE/4 Section 27, E/2 of Section 22, E/2 of Section 15 and E/2 of Section 10, in Township 19N, Range 13W) and scattered tracts, each less than 100 acres, along the northern boundary of the area (S/2 of Section 35 and S/2 of Section 36, Territory 20N, Range 15W; S/2 of Section 31, T20N, R14W; and N/2 Section 4 and NE/4 Section 3, T19N, R14W). None of the WMA south of the North Canadian River/Canton Reservoir was surveyed because the habitat did not appear suitable.

Most of the oak-dominated areas appeared to be too mature to be suitable for nesting vireos. Though most of the woody vegetation is shorter than 10 meters in height, a closed canopy woodland has formed with an understory too sparse for nesting vireos. Bird species commonly seen in this oak-dominated habitat included Summer Tanagers, Great Crested Flycatchers, Northern Cardinal, Painted Bunting, Blue-gray Gnatcatcher and Mississippi Kites - of which the first three are more typical of oak woodlands than oak scrub. Much of the private land north of the WMA has been cleared and converted to pasture or cropland (mostly winter wheat) thus fragmenting the remaining patches of native habitat on both the private land and the WMA. On tracts where woody vegetation does remain, much of the woody understory has been removed through brushhogging or grazing. Some encroachment by eastern red cedar (Juniperus virginiana) has occurred on the area also, though the degree of cedar encroachment appears to be much less than that seen on surrounding tracts of private land. Because much of the upland habitat on the WMA occurs as narrow bands or small tracts, it is difficult to conduct controlled burns to keep the oak woodlands in a scrubby, early successional state and to discourage encroachment by red cedar into clearing between oak thickets. We have no data to assess the density of nest predators on the area, but our observations of associated birds suggest that Brown-headed Cowbirds (Molothrus ater) are common on and surrounding the WMA. Cowbirds were detected in 11 of 16 sections surveyed, though it should be noted that survey effort was not uniform across all sections (Table 1). We did not see any cattle grazing on the WMA during our visits, however most adjacent properties to the north are grazed.

The combination of fragmented habitats, the difficulty in conducting controlled burns to maintain oaks in a scrub-like form while discouraging red cedar, and the potential for high nest parasitism by Brown-headed Cowbirds may be responsible for the

absence of Black-capped Vireos. These same factors also may preclude the successful recolonization of vireos on Canton WMA.

Lexington Public Hunting Area:

Lexington PHA is comprised of approximately 9,400 acres of post/blackjack oak woodland and tallgrass prairie. Surveys were conducted along most of the interior roads and the north and east boundary roads. Surveys were also conducted on foot in the northern portion of the area where oak-dominated scrub appeared most common. Oak woodlands were present throughout the area and based upon a visual estimate, accounted for 45-55% of the available habitat. Interspersed between areas of oak woodland and scrub were small cultivated food plots and tracts of tallgrass prairie maintained through prescribed early spring burning.

Most of the oak-dominated habitat on the Lexington PHA also appears to be too mature for nesting vireos. Much of the area has never been cleared or plowed and sufficient time has elapsed since acquisition by ODWC for mature woodlands to develop if this was not already its presettlement condition. Controlled burning is used as a management tool on the area, but it appears that most burns are not sufficiently hot to kill the crowns of trees and stimulate shrubby stump sprouts. Eastern red cedar encroachment does not appear to be a problem on the area and we found this tree to be relatively uncommon and compared to surrounding land. Human-created sources of habitat fragmentation (e.g. cultivated fields, tree plantings, tree clearing) also were minor. Because this area lies in a transition zone between crosstimbers woodland and tallgrass prairie, forest and grassland habitat types interdigitate with one another and the region appears naturally fragmented. The presence of large (> 1000 acres), continuous blocks of either habitat type is uncommon and it is likely that this was the historic condition of the land as well.

Brown-headed Cowbirds were seen in 4 of 10 sections surveyed, though again it should be noted that all sections were not surveyed with equal effort (Table 2). Cowbirds were not seen in large numbers compared to those found on Breeding Bird Survey Routes in this region (Noble, Holdenville, Eagle City, Verden and Choctaw BBS Routes; U.S. Bird Banding Lab reports) and they appear to be less than abundant. No livestock grazing occurs on the Lexington PHA thus cattle are absent which might attract cowbirds. Additionally, much of the land north, east and south of the area is wooded and not grazed. Cowbirds were seen repeatedly at bird feeders in the yards of at least two houses across the north boundary road from the Lexington PHA.

Seemingly good oak scrub habitat occurs in areas where the soil is thin and underlain by a shallow sandstone formations - usually along hilltops. Other apparently good habitat occurs along

some of the roads where bulldozers were used several decades ago to create clearings within the woodlands (Russ Horton pers. comm.). Oaks have stump-sprouted in these formerly cleared areas creating small oak thickets usually less than 10 acres in size. Though no Black-capped Vireos were detected in these sites, Painted Buntings were present suggesting that these may be suitable for vireos as well. Based on our observations, the Lexington PHA has potential for creating/recreating Black-capped Vireo habitat. Wooded hilltops occur in the NE/4 of Section 17, Section 16, the SW/4 Section 28 and possibly other areas which could be cut to stimulate the growth of oak scrub habitat. No discussions have occurred with the area biologist or within the ODWC regarding the consideration of Black-capped Vireo management within the existing management needs of the Lexington PHA. The Texas Parks and Wildlife Department has successfully managed Black-capped Vireos on several Wildlife Management Areas (e.g. Kerr WMA) for at least eight years. Texas Parks and Wildlife biologist have shown that nesting cover for Black-capped Vireos is also used as cover and forage by white-tailed deer and Rio Grande Turkeys and that the habitat management goals of these species with vireos is compatible (Armstrong 1995). It is premature to consider vireo management on the area until vireos are located or their probability of colonizing the area can be evaluated.

Canadian County Private Property:

This tract of private land is located near the community of Niles in extreme southwestern Canadian County. It is comprised of approximately 640 acres of very diverse habitats. Oak/juniper woodland or scrubland is the most prevalent habitat type, but other habitat include a unique canyon-floor forest, xeric sandstone outcroppings and a former crop field being restored to tallgrass prairie. The area surveyed by Mark Howery and Noreen Walsh was located in the SW/4 of Section 9, Township 11N, Range 10W. In this area, as in most of the property, encroachment of former oak scrub by eastern red cedar was the most notable problem. Years of fire suppression and possible overgrazing by previous landowners has allowed red cedar to spread to nearly all upland habitat on the property. Most of the oak on the canyon rim has a stunted, scrubby appearance. While we have no empirical data to explain this, it appears that the shallow, or sandy drought-prone soils around the canyon inhibit or stunt the growth of these trees which in turn slows the development of closed canopy forest. Red cedar does appear to be more tolerant of these soil conditions than the oaks and it colonizing grassy spaces between oak clumps. Brown-headed cowbirds were seen during the survey but no quantitative estimate was made of their abundance. The area is currently not grazed by cattle, but grazing does occur on surrounding properties thus the potential exists for a large cowbird population to be present.

V. RECOMMENDATIONS:

We recommend that additional survey effort be directed toward Lexington PHA and the private property site in the next few years. Both of these sites have potentially suitable Black-capped Vireo habitat and undetected vireos may be present on or adjacent to these properties. A follow-up survey to the extreme western portion of Canton WMA and some of the surrounding private land to the northwest also is warranted, but a lower priority.

Several factors may have contributed to the apparent absence of vireos on the surveyed properties. Much of the survey effort on Lexington PHA was conducted in June and early July - later than the optimum survey period of May 1 - 30 (Joe Grzybowski pers. comm.). Additionally, the tape recording used in the surveys was found to be inferior in terms of loudness to those used by biologists at Draper Lake and the Salt Creek Canyon area. A new tape with a greater sound carrying ability has since been acquired and will be used in future surveys. Observations made by Vicki Byre at Draper Lake this year suggest that where vireos occur in low densities, territorial singing is less frequent (Vicki Byre pers. comm.). Because vireo density on the surveyed properties is at best low, intra-specific competition for suitable habitat would be relatively low and males may greatly reduce the amount of effort placed into singing and territory defense once territories are established in early May.

On the Lexington PHA, we feel it is premature to begin discussions regarding habitat manipulation for vireos until the presence of vireos can be documented or the likelihood of recolonization by vireos can be assessed. The current habitat rehabilitation work being conducted by the Canadian County landowner and the U.S. Fish and Wildlife Service should be continued. Because this site was occupied by Black-capped Vireos in the recent past, the potential exists for vireos to remain in the vicinity which could recolonize this site if habitat conditions improved.

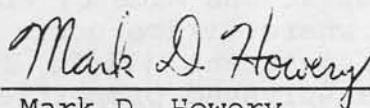
VI. SIGNIFICANT DEPARTURES:

Draft Vireo Management Plans were not prepared for any of the three survey areas because Black-capped Vireos were not present (procedure 4). The survey of Lexington PHA required more time than initially conceived, therefore personnel time and funds were not available to survey sections of Roman Nose State Park or Little River State Park. Vicki Byre, Oklahoma Museum of Natural History, extensively surveyed the Draper Lake area with funding made available from the Oklahoma Chapter of The Nature Conservancy (procedure 6). Based on small population size and poor prospects for significant habitat management at Draper Lake, we recommend only minimal effort be placed into monitoring this particular population.

ACKNOWLEDGEMENTS:

I would like to thank fellow ODWC biologists Melynda Hickman and Steve Conrady for their assistance in conducting vireo surveys at Canton WMA. Julian Hilliard assisted with surveys as well and Vonda Miller and Bill Lehman provided help during the preparation of this report. Special thanks goes to Joe Grzybowski and Vicki Byre for their expertise and advice regarding Black-capped Vireo biology, habitat affinity and survey methods and to U.S. Fish and Wildlife Service biologist, Noreen Walsh, whose assistance and knowledge was essential for the completion of this project.

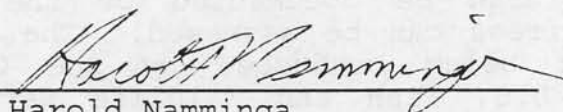
VII. Prepared by:



Mark D. Howery
Natural Resources Biologist

IX. Date: 19 December 1996

X. Approved by:



Harold Namminga
Federal Aid Coordinator

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Figure 1a. Canton Wildlife Management Area
 Sections 27, 22 and 15, T19N, R13W; Canton Quadrangle

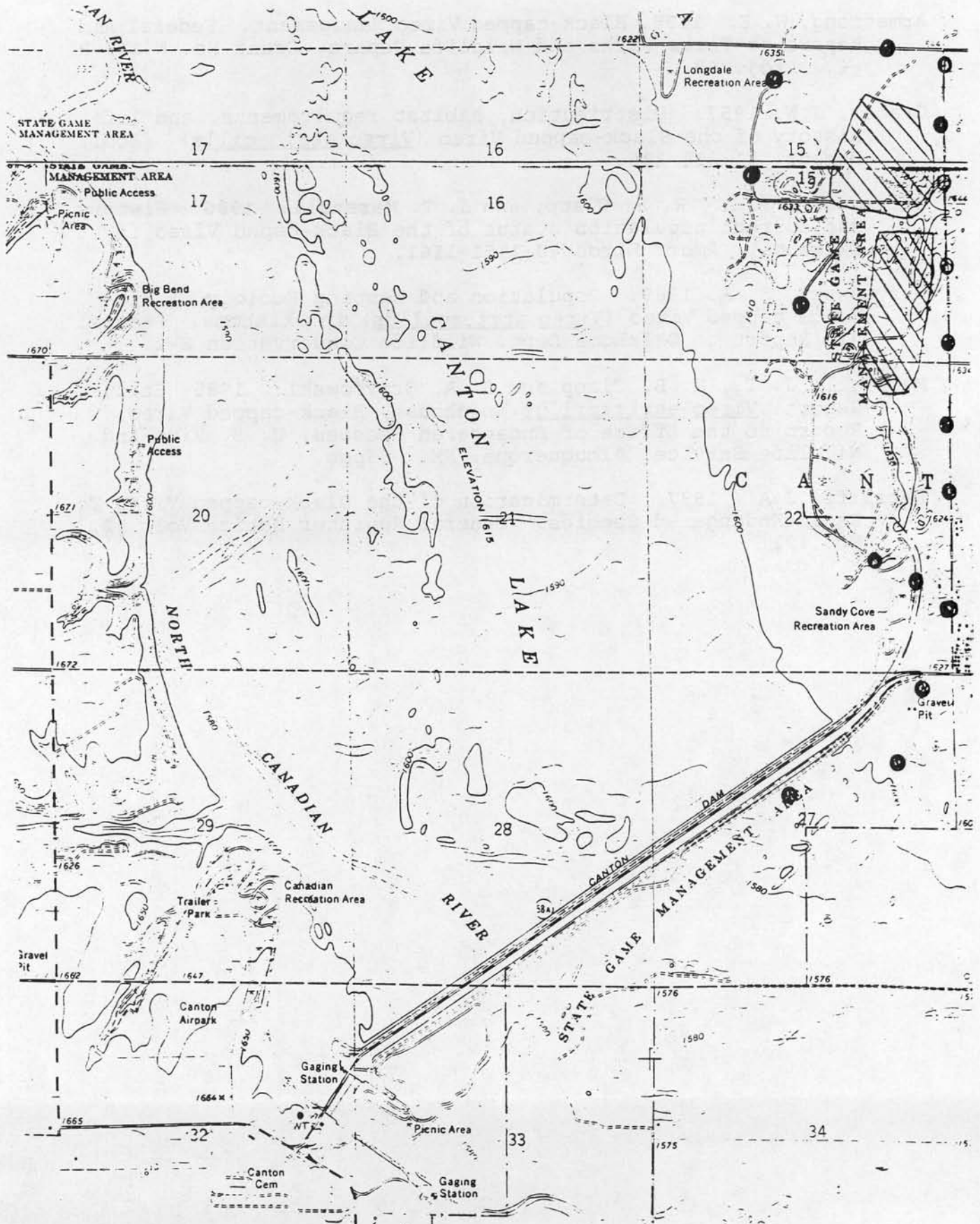


Figure 1b. Canton Wildlife Management Area
 Sections 6 (part), 5, 4, 9 and 10, T19N, R13W,
 Longdale Quadrangle

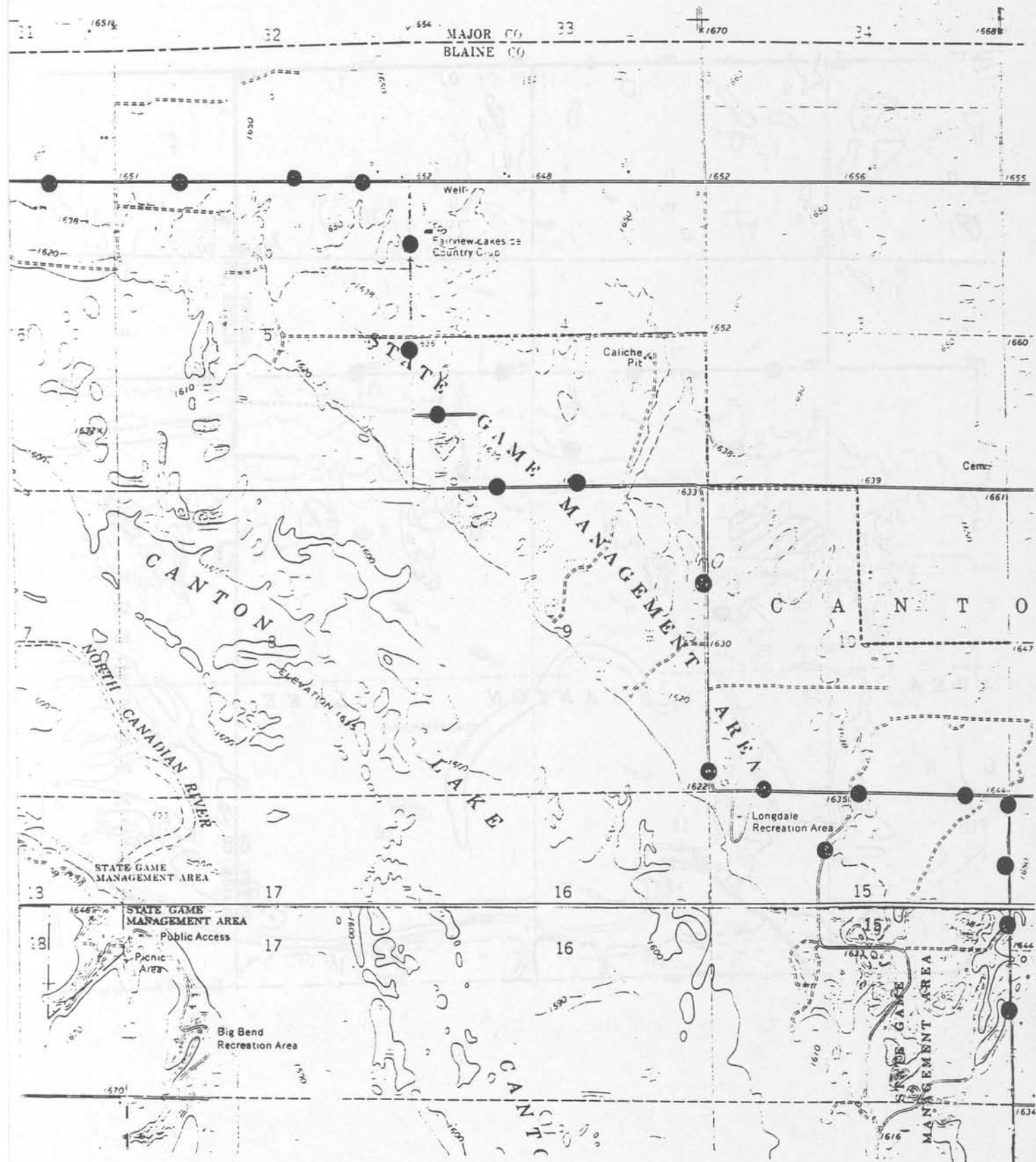


Figure 1c. Canton Wildlife Management Area
Section 6 (part) T19N, R13W
Sections 1 and 2, T19N, R14W, Canton NW Quadrangle

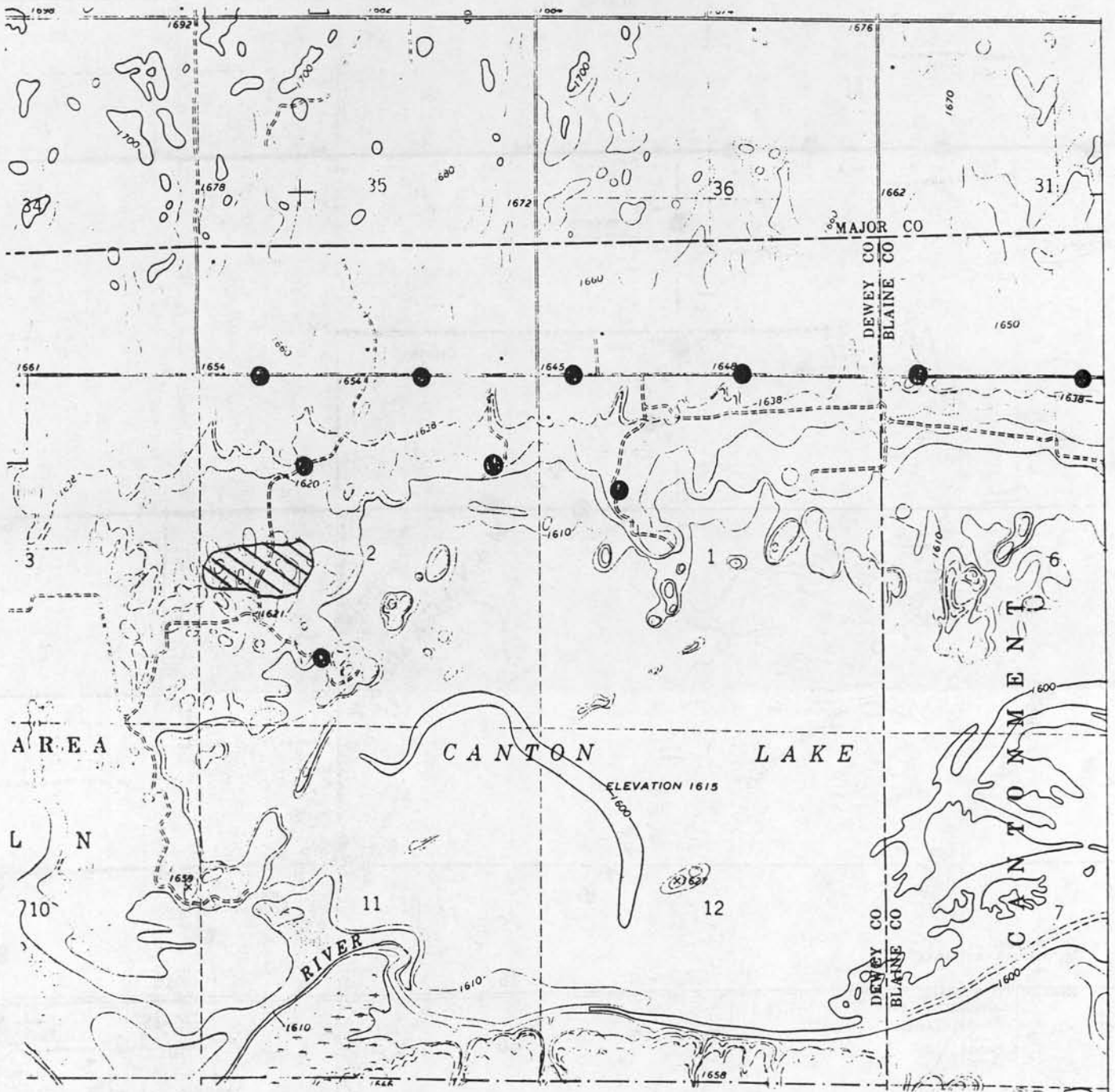


Figure 1e. Canton Wildlife Management Area
 Section 6, T19N, R14W, Canton NW Quad.
 Section 1, T19N, R15W, Sections 35 and 36, T20N, R15W
 Orion Quadrangle

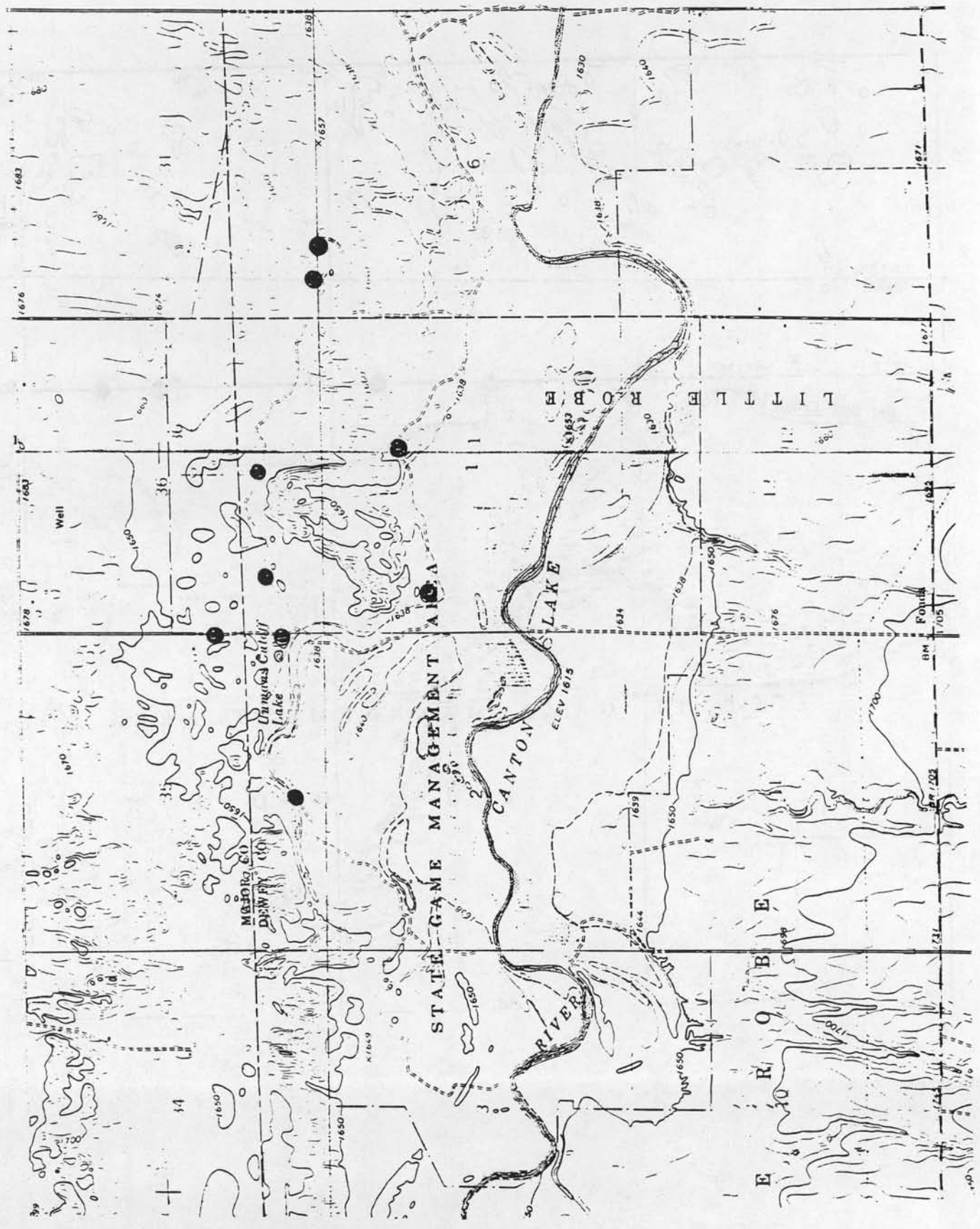


Figure 2a. Lexington Public Hunting Area
 Sections 16, 17, 18, 19, 20, 21, 28/33, 29/32, 30/31
 T7N, R1E, Cleveland County; Eason Quadrangle

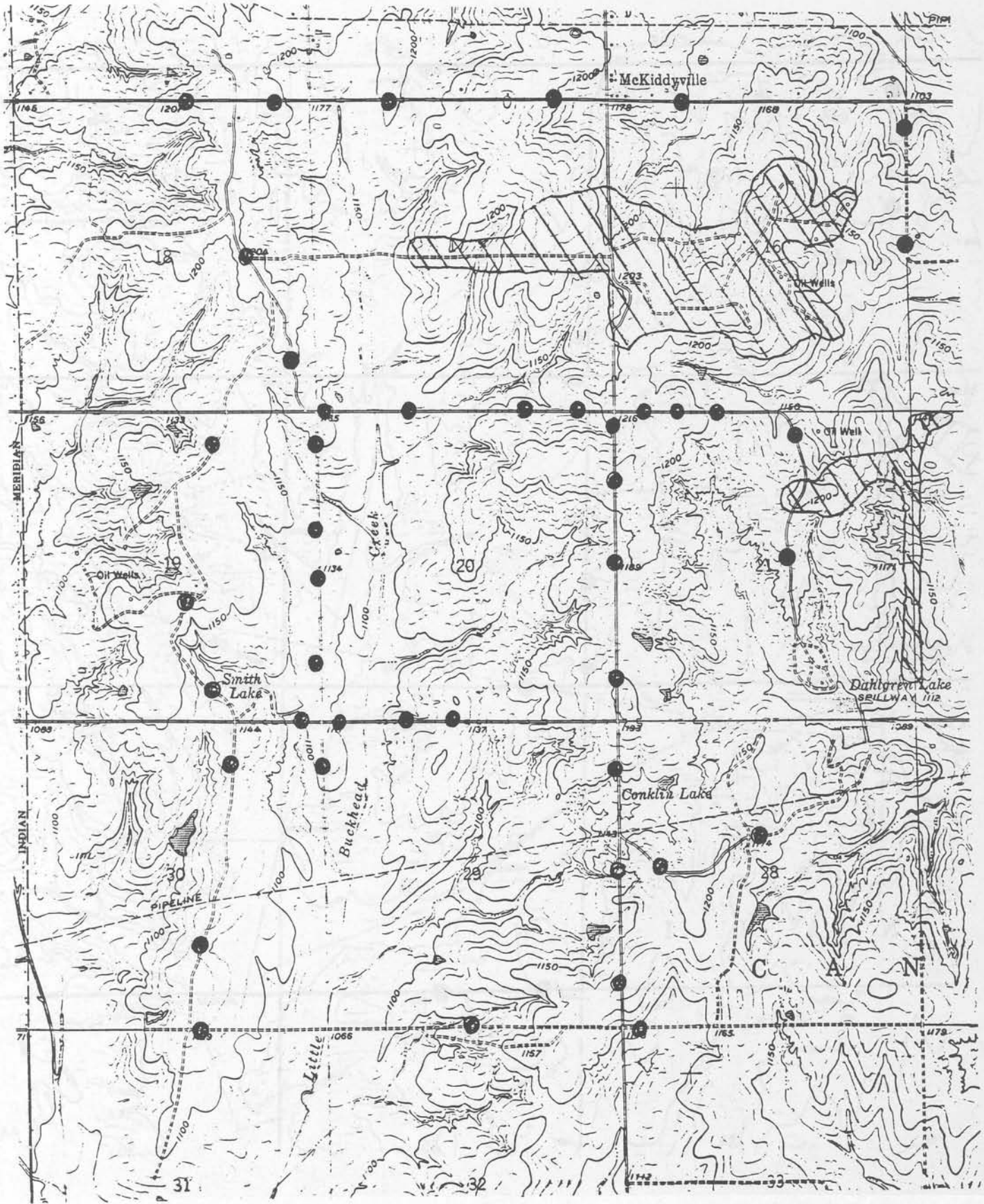


Figure 2b. Lexington Public Hunting Area
 Sections 15, 22, 23, 26/35
 T7N, R1E, Cleveland County; Eason Quadrangle

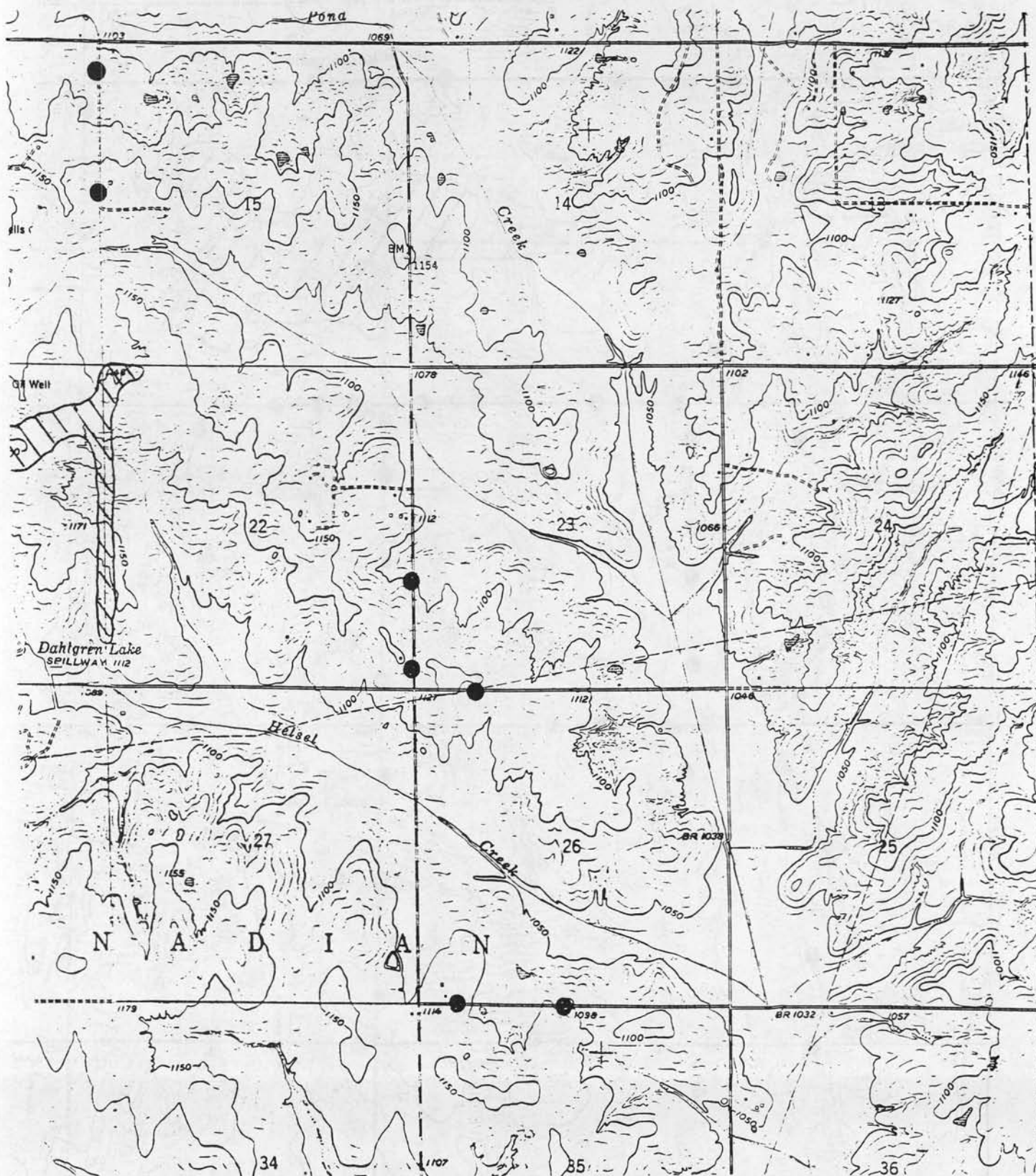


Figure 3. Private Property near Niles
 SW/4, Section 9, T11N, R10W, Canadian County;
 Hinton Quadrangle

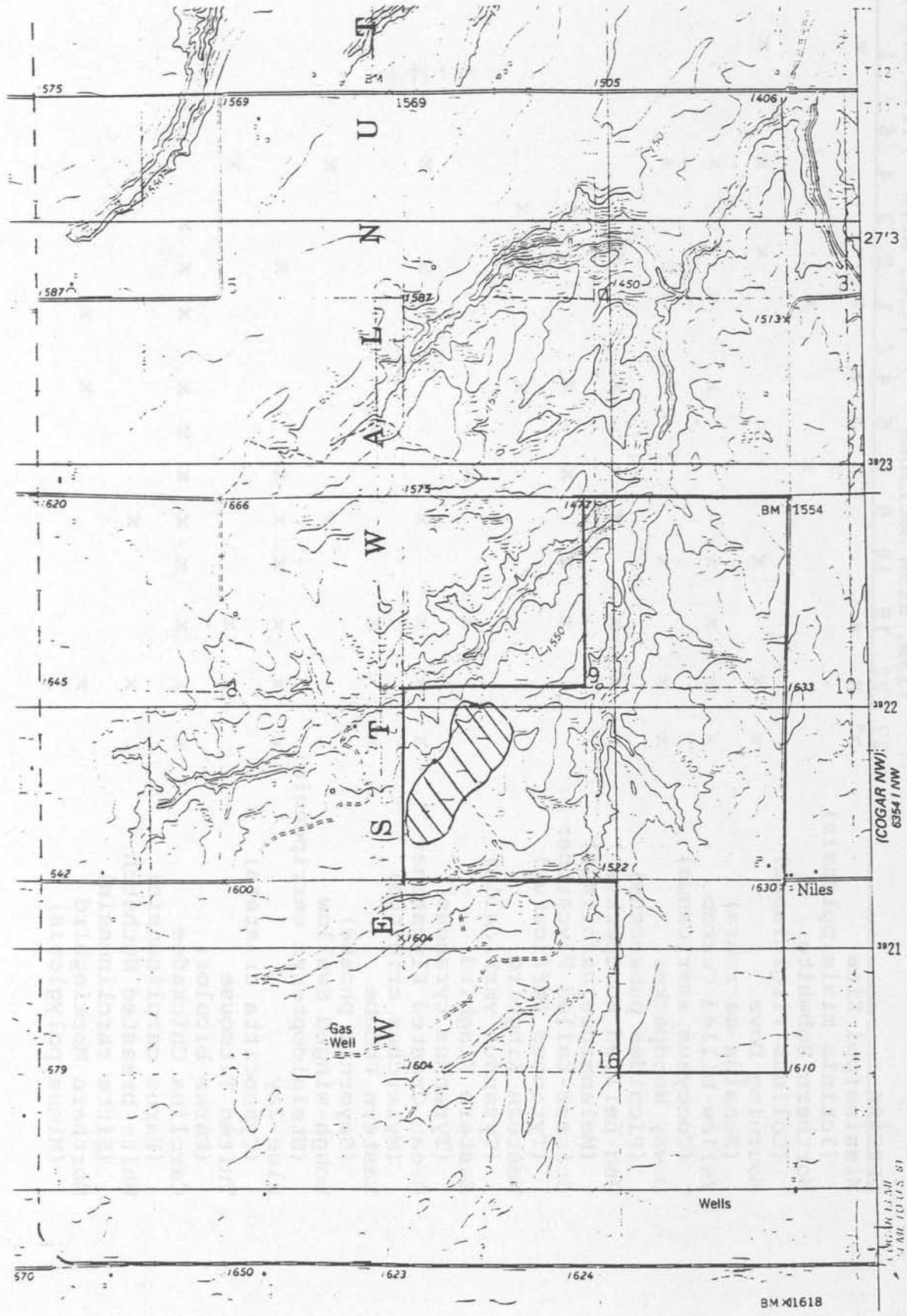


Table 1. Canton WMA Bird Survey Results

Species	T19N, R13W Sections								/	T19N, R14W				/T19N, R15W/T20N, R15W			
	27	22	15	10	9	6	5	4		1	2	3	4	6	1	35	36
Mississippi Kite (<i>Ictinia mississippiensis</i>)	x ^a	x	x				x	x	x					x		x	
Northern Bobwhite (<i>Colinus virginianus</i>)						x			x							x	
Mourning Dove (<i>Zenaida macroura</i>)	x	x		x			x			x		x		x			
Yellow-billed Cuckoo (<i>Coccyzus americanus</i>)	x	x	x	x				x	x	x		x				x	
Downy Woodpecker (<i>Picoides pubescens</i>)	x	x		x					x			x					
Red-bellied Woodpecker (<i>Melanerpes carolinus</i>)	x	x	x		x			x		x							
Scissor-tailed Flycatcher (<i>Tyrannus forficatus</i>)			x	x		x		x				x					
Western Kingbird (<i>Tyrannus verticalis</i>)								x				x					
Eastern Kingbird (<i>Tyrannus tyrannus</i>)			x			x	x										
Great Crested Flycatcher (<i>Myiarchus crinitus</i>)	x	x	x		x					x		x					
Eastern Phoebe (<i>Sayornis phoebe</i>)	x		x				x										
Rough-winged Swallow (<i>Stelgidopteryx serripennis</i>)					x							x					
Blue Jay (<i>Cyanocitta cristata</i>)	x	x	x	x	x	x				x						x	
Tufted Titmouse (<i>Parus bicolor</i>)		x	x									x					
Carolina Chickadee (<i>Parus carolinensis</i>)	x	x	x	x	x	x	x	x	x	x	x		x				
White-breasted Nuthatch (<i>Sitta carolinensis</i>)		x			x												
Northern Mockingbird (<i>Mimus polyglotis</i>)		x						x	x		x						

Table 1. cont'

Species	T19N, R13W Sections								/	T19N, R14W				/T19N, R15W/T20N, R15W			
	27	22	15	10	9	6	5	4		1	2	3	4	6	1	35	36
Bewick's Wren (Thryomanes bewickii)			x							x							
Carolina Wren (Thryothorus ludovicianus)	x	x	x	x			x			x						x	
Eastern Bluebird (Sialia sialis)				x	x	x						x					
Blue-gray Gnatcatcher (Polioptila caerulea)	x	x	x	x	x	x	x		x	x	x		x			x	
Bell's Vireo (Vireo bellii)				x	x	x	x		x	x	x		x	x		x	
Warbling Vireo (Vireo gilvus)		x	x	x	x												
Red-eyed Vireo (Vireo olivaceus)	x		x	x						x							
Black and White Warbler (Mniotilta varia)	x		x		x					x							
Yellow Warbler (Dendroica petechia)	x	x		x	x		x			x							
Summer Tanager (Piranga rubra)		x	x														
Eastern Meadowlark (Sturnella magna)				x		x	x	x	x	x		x				x	
Red-winged Blackbird (Agelaius phoeniceus)				x	x		x				x		x				
Common Grackle (Quiscalus quiscula)				x			x			x							
Brown-headed Cowbird (Molothrus ater)	x	x	x	x		x		x	x		x		x	x		x	
Northern Oriole (Icterus galbula)		x			x		x	x				x					
Northern Cardinal (Cardinalis cardinalis)	x	x	x	x		x	x	x	x	x	x	x		x		x	
Blue Grosbeak (Guiraca caerulea)				x				x	x							x	

Species	T19N, R13W Sections								/ T19N, R14W				/T19N,R15W/T20N,R15W			
	27	22	15	10	9	6	5	4	/ 1	2	3	4	6	/ 1	/ 35	36
Indigo Bunting (<i>Passerina cyanea</i>)	x	x	x	x	x		x	x		x	x	x		x		x
Painted Bunting (<i>Passerina ciris</i>)	x	x	x												x	
Dickcissel (<i>Spiza americana</i>)						x	x						x			x
Lark Sparrow (<i>Chondestes grammacus</i>)								x			x	x	x			
Field Sparrow (<i>Spizella pusilla</i>)			x	x		x	x	x	x	x	x	x	x	x		x

Other Species Seen (nonbreeding migrants designated by an (M)): White Pelican, Double-crested Cormorant, Great Blue Heron, Great Egret, Cattle Egret, Little Blue Heron, Snowy Egret, Turkey Vulture, Red-tailed Hawk, Wood Duck, Killdeer, Ruby-throated Hummingbird, Chimney Swift, American Crow, Chipping Sparrow (M), Orchard Oriole (M), American Goldfinch

^a Please note that survey effort was not uniform across all Sections.

Table 2. Lexington WMA Bird Survey Results

Species	T7N, R1E Sections									
	16	17	18	19	20	21	22	28/33	29/32	30/31
Northern Bobwhite (<i>Colinus virginianus</i>)					x					
Mourning Dove (<i>Zenaida macroura</i>)		x	x	x	x	x		x	x	x
Yellow-billed Cuckoo (<i>Coccyzus americanus</i>)	x	x			x	x		x		x
Ruby-throated Hummingbird (<i>Archilochus colubris</i>)		x				x				
Downy Woodpecker (<i>Picoides pubescens</i>)		x			x	x				
Red-bellied Woodpecker (<i>Melanerpes carolinus</i>)	x	x	x		x	x		x	x	
Scissor-tailed Flycatcher (<i>Tyrannus forficatus</i>)			x	x	x					x
Eastern Kingbird (<i>Tyrannus tyrannus</i>)			x			x		x		
Great Crested Flycatcher (<i>Myiarchus crinitus</i>)		x				x			x	
Eastern Phoebe (<i>Sayornis phoebe</i>)			x	x						x
Rough-winged Swallow (<i>Stelgidopteryx serripennis</i>)		x				x	x	x		
Blue Jay (<i>Cyanocitta cristata</i>)	x								x	
Tufted Titmouse (<i>Parus bicolor</i>)	x	x		x	x	x	x	x	x	x
Carolina Chickadee (<i>Parus carolinensis</i>)		x	x		x	x	x	x	x	x
White-breasted Nuthatch (<i>Sitta carolinensis</i>)					x	x			x	
Carolina Wren (<i>Thryothorus ludovicianus</i>)	x	x			x	x		x	x	x
Eastern Bluebird (<i>Sialia sialis</i>)			x		x					x

Table 2. Cont'

Species	T7N, R1E Sections									
	16	17	18	19	20	21	22	28/33	29/32	30/31
Blue-gray Gnatcatcher (<i>Polioptila caerulea</i>)	x	x	x	x	x	x	x	x	x	x
Bell's Vireo (<i>Vireo bellii</i>)			x	x	x	x				
White-eyed Vireo (<i>Vireo griseus</i>)		x			x				x	
Red-eyed Vireo (<i>Vireo olivaceus</i>)	x	x			x	x	x		x	
Black and White Warbler (<i>Mniotilta varia</i>)	x					x			x	
Yellow-breasted Chat (<i>Icteria virens</i>)		x						x		
Kentucky Warbler (<i>Oporornis formosus</i>)					x	x			x	
Summer Tanager (<i>Piranga rubra</i>)	x	x			x	x	x			x
Eastern Meadowlark (<i>Sturnella magna</i>)			x		x					
Red-winged Blackbird (<i>Agelaius phoeniceus</i>)			x						x	
Brown-headed Cowbird (<i>Molothrus ater</i>)		x	x	x				x		
Northern Cardinal (<i>Cardinalis cardinalis</i>)	x	x	x	x		x		x	x	x
Blue Grosbeak (<i>Guiraca caerulea</i>)			x	x	x	x		x		
Indigo Bunting (<i>Passerina cyanea</i>)	x	x	x	x	x	x	x	x	x	x
Painted Bunting (<i>Passerina ciris</i>)	x	x			x	x				
Dickcissel (<i>Spiza americana</i>)				x						x
Field Sparrow (<i>Spizella pusilla</i>)		x	x	x	x	x		x	x	x

Other Species Seen: Great Egret, Cattle Egret, Little Blue Heron, Turkey Vulture, Red-tailed Hawk, Greater Roadrunner Chimney Swift, American Crow

Figure 1a. Canton Wildlife Management Area
 Sections 27, 22 and 15, T19N, R13W; Canton Quadrangle

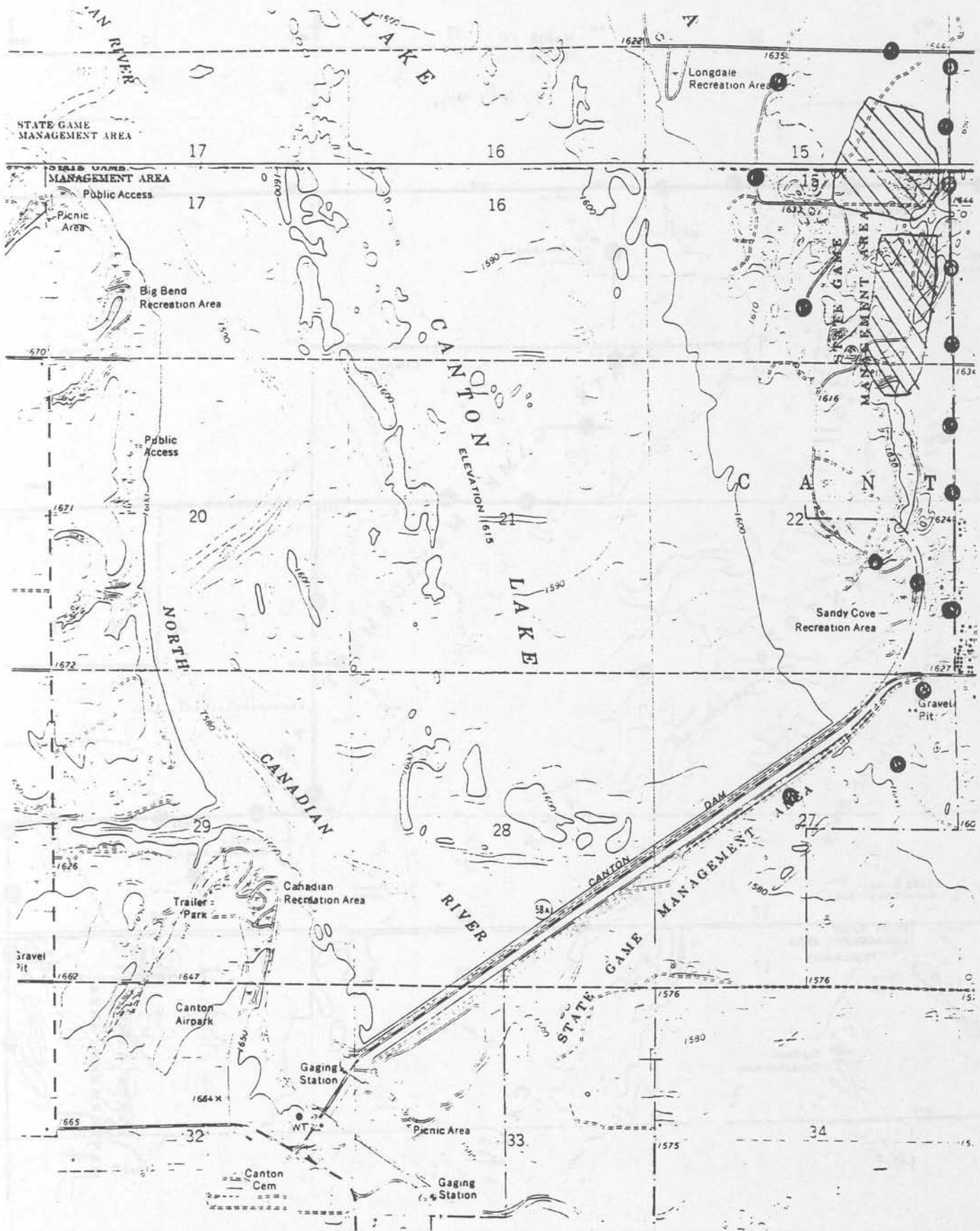


Figure 1b. Canton Wildlife Management Area
 Sections 6 (part), 5, 4, 9 and 10, T19N, R13W,
 Longdale Quadrangle

