

ILLINOIS
DEPARTMENT OF
NATURAL
RESOURCES

MEMORANDUM

to: Jennifer Alterra (Federal Aid and Special Projects)

from: Ed Anderson *EA*

date: October 16, 2001

subject: **Wildlife Preservation Fund Project: FY02 - 011W - Final Report**

Enclosed are 6 copies of the final report for the Illinois Wildlife Preservation Fund Project FY02 - 011W, "Results of Inventories for Red-shouldered Hawk Nesting....." I provided copies for the following, Randy Nyboer (1), Anne Mankowski (1), John Alesandrini (1), Doug Dufford (1), Scott Schaeffer (1), Dan Wenny (1). Also enclosed is one 3 1/2" diskette.

Jon provided several color slides and photographs which I will forward at a later date. I would like to make copies of these for District 4 and other files.

Note: the lapse in time from when the Payment Request Certification was received and signed was due to the omission of a map from the final report. This omission was noted and the map requested and later received from the vendor.

If you have any questions, please let me know.

cc: Randy Nyboer
Anne Mankowski
John Alesandrini
Doug Dufford
Scott Schaeffer
Dan Wenny
Jon Stravers
file

**RESULTS OF INVENTORIES FOR RED-SHOULDERED HAWK NESTING,
AND INVESTIGATIONS OF REOCCUPATION RATES OF NESTING SITES
ALONG THE MISSISSIPPI RIVER – YEAR 2001.**

Submitted To:

**U.S. Fish and Wildlife Service, McGregor and Annada Districts
U.S. Army Corps of Engineers Natural Resource Management Section, Rock
Island District.
Illinois Department of Natural Resources Wildlife Preservation Fund
National Audubon Society Upper Mississippi River Campaign**

Submitted By:

**Jon Stravers, Midwest Raptor Research Fund
P.O. Box 309, McGregor, IA 52157
Ph 319-586-2621**

July 1, 2001

ABSTRACT

Between February and June of 2001, searches were conducted on 57 days for evidence of Red-shouldered Hawks nesting along the Mississippi River. In the McGregor District, Red-shouldered Hawks were observed in 13 areas; nesting was confirmed in nine sites and suspected in four sites. In eight other areas that have high potential as Red-shouldered Hawk nesting habitat searches were considered incomplete. No evidence of Red-shouldered Hawks was found in four sites where searches were considered complete. In the Wapello District, Red-shouldered Hawk nesting was confirmed or suspected in four areas, three within the Milan Bottoms complex, and one near the confluence of the Iowa River near the Lake Odessa complex. Searches in three other areas in this district were considered incomplete. In the Annada District, a single Red-shouldered Hawk was observed. Searches in six other areas were considered incomplete. In addition to the observations on Red-shouldered Hawks, a total of 61 bird species were heard or seen during inventories in five sites within the Annada District.

We determined the outcome of twelve Red-shouldered Hawk nesting attempts in 2001. Of these, four were successful (33.3%) and produced four nestlings for an average of 1.0 nestlings per successful nesting attempt and 0.33 nestlings per successful nesting attempt.

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RESEARCH OBJECTIVES

1. Search previously active Red-shouldered Hawk (*Buteo lineatus*) nesting sites and potentially new nesting sites within the McGregor District of Upper Mississippi River National Fish and Wildlife Refuge, the Milan Bottoms and other locations in Pools 16 and 17, and the Annada District in Pools 21 & 22 in order to determine nest site reoccupation rates for the known nesting sites and locate new nesting territories.
2. Determine reproductive success at the known Red-shouldered Hawk nesting attempts within the Upper Mississippi River National Fish and Wildlife Refuge, and compare reproductive success during the year 2001 with those found in previous years along the Mississippi River and with those found in regions of North America.
3. Estimate forest regeneration and replacement rates within the various Red-shouldered Hawk nesting sites and estimate future habitat needs for this species within the Upper Mississippi River National Fish & Wildlife Refuge.
4. Collect additional baseline information on several other species of interest within the Refuge, including Black-crowned Night Heron (*Nycticorax nycticorax*), Yellow-crowned Night Heron (*Nyctanassa violacea*), Cerulean Warbler (*Dendroica cerulea*)

RATIONALE FOR PROPOSED RESEARCH:

1. Red-shouldered Hawks are considered endangered in Iowa and Illinois and of special concern or threatened in Minnesota and Wisconsin. Although some stretches along the Mississippi River, such as Pool 10 in the McGregor District, have significant densities of nesting Red-shoulders, there are only a few known active nesting sites in most sections of the Upper Mississippi River (Stravers 1992 & 1996, Stravers & McKay 1994).
2. Red-shouldered Hawks are indicators of high quality habitat and are considered an "Umbrella Species." They prefer large tracts of mature flood-plain forests and they have a strong nest-site fidelity, often returning to the same nest site each spring. Management practices that favor Red-shouldered Hawks are likely to benefit several species of concern that require large unfragmented forest tracts, especially some of the neotropical migrant passerines whose status is uncertain.
3. Our understanding of habitat requirements for Red-shouldered Hawks has increased and changed somewhat during the last five years. However, we feel that important information concerning Red-shouldered Hawk reproductive success and information on the relationship between these hawks and a changing forest structure can only be determined with long-term monitoring. Increased understanding of Red-shouldered Hawk nesting requirements and the cooperation of various agencies along the river should reduce the potential for conflict with planned forest harvests.
4. There is very little information currently available on the status or presence of several other species of interest that co-inhabit some of these flood-plain forest habitats. Collecting initial information on presence/absence for several other species such as Black and Yellow-crowned Night Herons and Cerulean Warblers could be accomplished simultaneously during Red-shouldered Hawk investigations.

BACKGROUND ON RED-SHOULDERED HAWKS

At the time of European settlement, Red-shouldered Hawks were probably one of the more common raptors in the Upper Midwest (Anderson 1907; Bailey 1918). Fragmentation and clearing of many of the flood plain forests, the conversion of flood plains into cropland, and the channelization of streams, created more favorable conditions for the more common Red-tailed Hawk (*Buteo jamaicensis*) which utilizes edge habitats and is more adapted to agricultural activity (Brown 1964; Hands et al 1989; Palmer 1988).

By the early 1960's, Red-shouldered Hawks remained in only a few sites along some of the larger streams in eastern Iowa and in isolated habitats in various portions of Iowa (Brown 1964 & 1971; Roosa & Stravers 1989); declines in Illinois appear to be similar (Bowles & Thom 1981; Hands et al 1989). Red-shouldered hawk population declines occurred during an era when pesticide contamination caused population declines in other raptors such as Peregrine Falcons and Bald Eagles (Henny & Anderson 1968; Hickey 1969). However, since no specific research was being conducted on Red-shouldered Hawks in this region during that period, we are not certain of the cause and affect or the specific population dynamics.

Red-shouldered Hawks have been on the state endangered species list in Iowa since 1977 (Roosa 1977) and in Illinois since 1981 (Bowles & Thom 1981).

Red-shouldered Hawks are considered an important indicator species since they nest in large tracts of mature floodplain forests (Bednarz & Dinsmore 1981; Stravers & McKay 1993). A variety of factors contribute to their presence or absence such as forest size, age, and structure, as well as the availability of suitable wetland habitats for foraging. During the nesting season, their diet consists largely of frogs, crayfish, snakes, small mammals, birds, and possibly fish on some occasions (Bednarz & Dinsmore 1981; Crocoll 1994; Stravers 1996).

Because of the long-term stability of refuge habitats along the Upper Mississippi River, some sections of the Upper Mississippi River Valley support apparently healthy populations (Stravers & McKay 1993). During the past few years there has been an apparent increase in the number of Red-shoulders in the field reports from Ornithologists in Iowa, Minnesota, and Wisconsin. However, during 1999 and 2000 we found that Red-shoulders were absent from several locations that were previously considered active nesting sites.

METHODS

Methodology for Red-shouldered Hawk inventories generally followed the protocol used in previous years and suggested by Craighead & Craighead (1956) and Fuller & Mosher (1987). Because of the high water levels on the Mississippi River during April and May of 2001, most of the inventories had to be conducted by boat.

Initial inventories for suitable Red-shouldered Hawk nesting areas were conducted using topographic maps, aerial photos, notes from previous searches in this region, and from comments obtained from various land managers and biologists. Previously known Red-shoulder nesting locations, areas of suspected nesting, and other areas of high potential were searched for evidence of Red-shouldered nesting prior to leaf out. Several other randomly selected areas were also searched.

All observations during this study were conducted in a manner that minimized the disturbance to the nesting hawks. Duration of the visits to active nests was kept to a minimum and, in most cases, observations were not conducted during inclement weather. Some sites were visited regularly (every 7-10 days) in order to establish chronology and maintain a record of activity. In order to reduce observer disturbance and make initial estimates on the potential affect of observer disturbance, other nesting sites were visited only three times during the nesting season, and some sites were purposely not visited. We monitored the activity of the nestling Red-shoulders at some nesting sites during the post fledging period between 10 June and 30 June.

In the Annada District, we also collected information on all birds in five areas where searches were conducted for Red-shouldered Hawk nesting (See Maps 2-4).

All known active raptor nests and suspected breeding territories were plotted on Mississippi River Navigational charts or topographic maps. We attempted to determine the history of forest management at each known Red-shouldered Hawk nesting territories. Distances between active nests was calculated, as well as various distances to specific habitat features such as open water, forest edge, and areas of potential human disturbance (see sample data sheet).

Note: Data sheets for Red-shouldered Hawk nesting sites within the Milan Bottoms are included with this report. Data sheets are kept on file for all of the known Red-shouldered Hawk nesting sites along the Mississippi River Between Wabasha, Minnesota and Hannibal, Missouri. They are available on request.

RESULTS

Between February and June of 2001, searches were conducted on 57 days for evidence of Red-shouldered Hawks nesting along the Mississippi River.

In the McGregor District, Red-shouldered Hawks were observed in 13 areas; nesting was confirmed in nine sites and suspected in four sites (Table 1). Searches in eight other areas that have high potential as Red-shouldered Hawk nesting habitat were considered incomplete (Table 2). No evidence of Red-shouldered Hawks was found in four sites where searches were considered complete (Table 3A), and no searches were conducted in four sites that have potential as Red-shouldered Hawk nesting habitat (Table 3B).

In the Wapello District, Red-shouldered Hawk nesting was confirmed or suspected in four areas (Table 4), three within the Milan Bottoms complex (Map 1), and one near the confluence of the Iowa River near the Lake Odessa complex. Searches in three other areas in this district were considered incomplete.

In the Annada District, a single Red-shouldered Hawk was observed (Table 5). Searches in six other areas were considered incomplete. In addition to the observations on Red-shouldered Hawks, a total of 61 bird species were heard or seen during inventories in five sites within the Annada District (Table 6; Maps 2-5).

REPRODUCTIVE SUCCESS - 2001

We determined the outcome of twelve nesting attempts in 2001. Of these, four were successful (33.3%) and produced four nestlings for an average of 1.0 nestlings per successful nesting attempt and 0.33 nestlings per successful nesting attempt.

Successful nesting attempts were located at Upper Sny Magill Slough, the lower Wisconsin River, and Kain's Siding North in the McGregor District, and near the confluence of Sand and Mill Creeks in the Milan Bottoms. Nesting attempts at Kain's Siding East, Sny Magill/Effigy, Sny Magill Creek, Lower Sny Magill/Clayton, Glen Lake/Wyalusing, Plum Creek, and Spring Lake/Dead Lake in the McGregor District all failed, as did nests at Kickapoo Slu, and the Powerline in Milan Bottoms.

During the past 18 years, the overall average for Red-shouldered Hawk nesting attempts along the Mississippi River has been 67% (Stravers 1992; Stravers and McKay 1993 & 1998; and pers obs). The reproductive success rate during 2001 of 33.3% was similar the reproductive success rate during 1993 (another flood year), and the reproductive success during these two years were the lowest found along the Mississippi River between 1983 and 2001. Most likely, the low reproductive success rate in 2001 was partially linked to the extended periods of high water. (Water levels were high enough to keep navigation traffic off the river and some of the Locks and Dams were closed for the longest period on record). Reproductive success rates were also linked to extended periods of cool and wet weather that occurred at the onset of incubation and again at the onset of hatch. From personal observations, it appears that the weather during these two periods has the potential to be critical.

MILAN BOTTOMS

Three nesting attempts were confirmed within the Milan Bottoms Complex (Map 1; Table 4). The Powerline/Charlie Brandt nesting site has been active for the last four years. The Kickapoo Slu/Mill Creek site is a new location, although it is adjacent to several previous nesting attempts which were on the west side of Mill Creek. The nesting attempt on private property near the confluence of Mill and Sand Creeks has been active for the past two seasons. This was the only nesting attempt in the Milan Bottoms that was successful during 2001, which may be related to the fact that it is situated in the driest of the three nesting sites.

This year's reproductive success within the Milan Bottoms and also in the McGregor District was low compared to most of the previous years, but similar to 1993 when the river levels were also high (Stravers & McKay 1993 & 1994 & 1998). Sustained high water levels throughout the spring probably contributed to the low reproductive success, but reproductive success was also probably directly related to extended periods of cool wet weather during the period following hatch. (See Discussion of Water Levels).

Although the reproductive success was poor in 2001, it was interesting to find there were again three nesting attempts within the Milan Bottoms complex. The Milan Bottoms continues to be one of the most dependable sites up and down the Mississippi River in terms of Red-shouldered Hawk occupation. It will be interesting to see if the low reproductive success of 2001 influences the number of occupied territories in the spring of 2002.

ANNADA DISTRICT

From these rather brief observations during 2001, and from observations of Red-shouldered Hawks in the district by agency personnel and other biologists (Gary Swenson, USCOE, pers obs), it appears that there is good potential for Red-shouldered Hawk nesting in several locations within the Annada District. This District has extensive forest with suitable age, structure and diversity that probably provide potential Red-shouldered Hawk nest sites. However, wetland foraging habitat and the availability of suitable prey populations probably have an equal or even more significant impact on both nest site selection and on reproductive success and territory re-occupation.

This was the first year of specific investigations for Red-shouldered Hawks in the Annada District. The river and the floodplain in this district are greatly influenced by a system of levies. This appears to have a significant impact on Red-shouldered Hawk nesting densities and on nest-site selection. It appears that extensive levy systems in the Annada District effectively eliminate significant amounts of suitable wetland foraging habitat. The levies also increase the duration and depth of flooding within the floodplain. Because agricultural land generally is immediately adjacent to the levies, this gives an increase to the edge effect and generally makes a more favorable situation for the more common Red-tailed Hawks.

In summary, we can most likely expect lower densities of nesting Red-shouldered Hawks in the Annada District, but there is reason to suspect that there are several active Red-shouldered Hawks within the Annada District.

RESULTS OF INVESTIGATIONS FOR BLACK-CROWNED NIGHT HERONS AND CERULEAN WARBLERS

Black-crowned Night Herons were observed in four locations within the McGregor District during 2001. However, all of these observations involved perched or flying birds and no nesting sites were located. We searched the edges of several of the active Great Blue Heron rookeries and we searched several islands and various habitat types for Black-crowned Night Heron nests.

Most of the Black-crowned Night Heron sightings were near islands that had considerable stands of medium aged willows (*Salix sp.*). From the literature, it appears that these habitats are sometimes used as nesting sites.

Note: I plan to continue observations on this species during the summer of 2001 and write an additional report when those observations are finished.

Cerulean Warblers were only found in a few isolated situations within the floodplain. Perhaps one of the most abundant Cerulean Warbler populations along the river can be found in Wyalusing State Park at the confluence of the Wisconsin River. Also, a single male was heard in the Milan Bottoms on May 28.

There is a distinct need for more investigations on Cerulean Warblers within the Mississippi River Valley.

DISCUSSION OF WATER LEVELS AND STUDY EFFECTIVENESS

Extremely high water levels throughout much of the spring and unfavorable weather during some of the observations reduced the overall effectiveness of the inventories in the Annada District. The Mississippi River remained at flood stage for a month from late April to late May and was closed to commercial and recreational boating. Water levels were deep enough to make walking through the floodplain impossible.

From previous observations, it appears that extended periods of high water has the potential to reduce Red-shouldered Hawk nesting success (Stravers and McKay 1993). These high water levels also reduced our ability to conduct thorough inventories and they also have a direct affect on reproductive success in various species. During periods of normal water levels, observations during late May and early June can be effective at locating active nests since the fledgling hawks can become consistently vocal, and therefore easier to detect. However, the effectiveness of this method is reduced during years of low reproductive success. For example, some areas may well be active nesting territories, but if the nesting attempt failed prior to our observations in late May, then our chances of locating the birds is reduced because Red-shoulders are generally very quiet following the failure of a nesting attempt.

RECOMMENDATIONS

It appears that there is considerable forest diversity (in terms of age, structure, and species diversity) within the study areas in the Annada District. Bird diversity in terms of the number of species and the density of populations appear to be similarly significant. These habitats are well worth the effort to monitor on a long-term basis. However, the travel distance between the McGregor area (where the principal investigator lives and the Quincy/Hannibal area makes this project a difficult and expensive one to conduct.

We would like to see these investigations continued, but perhaps we need to include someone who is located within or at least near the Quincy, Illinois and Hannibal, Missouri area in order to conduct the investigations more effectively.

In contrast, observations in the McGregor District have been enhanced by the fact that there has been a consistent effort to investigate Red-shouldered Hawks in that district during the past 10 years. These observations become more valuable as they accumulate over time. We hope that some kind of monitoring of the Red-shouldered Hawk populations within the McGregor District and the Milan Bottoms continues in years to come.

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LIST OF PARTICIPANTS

Principal investigator, Jon Stravers

Coordinated and conducted field investigations, wrote the final report.

Field Assistants

Dave Kester, Jon Stravers Jr., Lisa Stravers, Julie McIntyre, Aaron Barna.

Agency participants: The following personnel had the opportunity to recommend sites to be searched and review field techniques.

John Lindell, Clyde Male, Neil Hennkenius from the U.S. Fish & Wildlife Service, McGregor District

Dave Ellis, U.S. Fish & Wildlife Service, Annada District

Gary Swenson, U.S. Army Corps of Engineers Natural Resources Section, Rock Island District.

Mike Griffin, Iowa Department of Natural Resources Bellevue Field Station

Scot Griffin and Karen Aulwes from IDNR Guttenberg Fish Hatchery,

Karen Westphal, U.S. Fish & Wildlife Service, Quincy, Illinois

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Table 1. Areas where we found nesting Red-shouldered Hawks or where we observed territorial behavior and we suspect nesting.

Kain's Siding South – USF&WS refuge, Pool 9, Iowa side – GPS 15T 0640264 UTM 4811072
Active nest located – nesting attempt failed.

Kain's Siding North – USF&WS refuge, Pool 9, Iowa side GPS 15T 0640013 UTM 4812575
active nest located – one nestling observed in nest 6/05

Wisconsin River/East End Wyalusing – Wisconsin DNR - GPS 15T 0656467 UTM 4761338 (general area)
active territory – adults present and calling on three occasions – nest not located

Lower Wisconsin River – Middle of Wyalusing – Wisconsin DNR - GPS 15T 0653466 UTM 4761933
– active nest located – young in nest observed 5/18 and 6/03.

Confluence Wisconsin & Mississippi River – USF&WS Refuge, – GPS 15T 0652005 UTM 4761437
- active nest located – adults present and calling on four occasions – appears to have failed.

Wyalusing/Glen Lake – USF&WS Refuge, Pool 10 – Wisconsin side – GPS 15T 0651873 UTM 4759230
active nest located – young in nest observed 5/18 – nothing observed 6/03 – appears to have failed.

Sny Magill Slough Upper – USF&WS refuge, Pool 10 – Iowa side – GPS 15T 0649630 UTM 4757977
– active nest located on 7th visit – one nestling near fledging age observed on 6/03 & 6/28

Sny Magill Slough/Effigy Mounds, Pool 10 – Iowa side – GPS 15T 0649278 UTM 4755987
– active nest located – nesting attempt failed.

Sny Magill Slough Lower – USF&WS Refuge, Pool 10 – Iowa side – GPS 15T 0649589 UTM 4754800
active nests located – young in nest observed 5/18 – but nothing observed on 6/03 – nesting attempt failed.

Sny Magill Slough/Clayton – USF&WS Refuge, Pool 10 – Iowa side – GPS 150650232 UTM 4753190
Single RSH observed in March and newly constructed nest located – no activity observed in April or May -
possibly occupied by a sub-adult or this could have been a failed nesting attempt.

Cassville Slough/Muddy Creek – USF&WS Refuge, Pool 11 – Wisconsin side
Pair of adults observed exhibiting territorial behavior on 6/07 – probably a successful attempt

Spring Lake/Dead Lake – USF&WS refuge, Pool 11, Iowa side
– active territory – nest not located.

Plum Creek/Bunker Chute – USF&WS refuge, Pool 11, Iowa side – GPS 15T 0669994 UTM 4726724
– active nest located – nesting attempt failed.

Table 2. Areas where we conducted partial searches in the McGregor District for Red-shouldered Hawks. Although no Red-shouldered Hawks were observed in these areas in 2001, all of these sites have high potential as nesting habitat.

Confluence of Upper Iowa River – USF&WS Refuge, Pool 9, Iowa side.
- partial search conducted – previously a confirmed nesting site.

Wexford Creek – a portion of the land searched was USF&WS Refuge, Pool 9, Iowa side.
- search of flood plain completed and some searches were conducted on the slope forest – RSH have been reported in this area from time to time.

Rush Creek/Winneshiek Slough – Wisconsin DNR land, adjacent to Pool 9,
- partial search conducted – habitat appears to be ideal.

Yellow River / Effigy Mounds National Monument Heritage Addition
- several searches conducted – no RSH activity observed.

Turkey River Mounds – USF&WS Refuge, Pool 11, Iowa side
- partial search conducted – previously confirmed nesting site.

Sandy Creek – USF&WS Refuge Land, Pool 11, Wisconsin side
- initial search conducted – previously confirmed nesting site, but nesting not confirmed since 1993.

Muddy Creek - USF&WS Refuge Land, Pool 11, Wisconsin side
- initial search conducted – previously confirmed nesting site but nesting not confirmed since 1993.

Bertom Lake - USF&WS Refuge Land, Pool 11, Wisconsin side
- initial search conducted – previously confirmed nesting site.

Table 3A. Areas within the McGregor District where searches were completed and we found no evidence of Red-shouldered Hawk nesting

Lower portion of Yellow River/Effigy Mounds National Monument, Iowa side
- inactive. Several searches conducted – previously confirmed nesting site.

Ambro Slough/Picatee Slough - USF&WS Refuge Land, Pool 10, Wisconsin side
- inactive. Eight searches conducted. RSH observed early in March, but no birds were heard or observed after late March.

Paint Creek – Iowa DNR state forest, Pool 10, area along the lower portion of Paint Creek is inactive.
- although we did not find any RSH activity along the lower portion of Paint Creek which was a previously confirmed nesting site, there was a report of pair of RSH located upstream on Paint Creek on Iowa DNR land

Thief Slough/Walter Lakes below Dairyland Power Plant – Pool 9, Wisconsin side, r.m. 677
- no RSH observed.

Table 3B. No searches have been conducted in the following areas.

Reno Bottoms – calling adult RSH reported by USF&WS personnel in 1994.

Upper Portion of Harpers Slough/Martelle Lake – adjacent to the west end of the dam – Iowa side

Catfish Slough/Glasner Lake – Pool 10 - r.m. 626 - Wisconsin side

Eagle Valley Nature Preserve – nesting reported in recent years along the bluff.

Table 4. Results of searches in the Milan Bottoms and Wapello District.

Milan Bottoms/Mill Creek – USCOE land just north of Kickapoo Slu – Illinois side
- active nest located – nesting attempt failed sometime before May 22.

Milan Bottoms/Power Line/Charlie's – USCOE land, Illinois side – GPS 15T 0695845 UTM 4591239
- active nest located – nest failed sometime before May 22.

Milan Bottoms/Sand Creek – private property, Illinois side – GPS 15T 0697979 UTM 4591614
- active nest – at least two youngsters reached fledging age.

Milan Bottoms/Cooter Slough – not active.

Lake Odessa Unit/IDNR – confluence of the Iowa River – r.m. 434.5 IA side
- RSH present and calling in March of 2001 – nest not located.

Lake Patterson – Iowa DNR area near the confluence of Skunk and Mississippi River.
- no activity noted. Search was conducted in late May and considered incomplete.

Big Timber Unit/Mark Twain Refuge – Wapello District – r.m. 443-447 – IA side – partial search conducted.

Mark Twain Refuge – Wapello District – r.m. 438-432 – IA side – partial search conducted.

Table 5 – Results of searches in the Annada District.

Beebe Island/Mill Creek area – r.m. 317 Illinois side – GPS 15S 0638482 UTM 4409134.

- single Red-shouldered Hawk observed perched and in flight on May 29.
- No calling – no territorial activity observed. (see Map #3)

Bear Creek Recreation Unit/Pecan Grove – r.m. 339-342 – Illinois side

- four searches conducted – high potential for RSH. (see Map #4)

Sny River Bottoms, r.m. 314-316 - Illinois side – three searches of this complex were conducted.

- an active Red-tailed Hawk nest was located, but this site is big enough and diverse enough that we still consider this areas to have high potential as RSH habitat. (see Map #2)

Long Island Complex, r.m. 333-339 – partial searches conducted.

- two pair of Mississippi Kites were observed, both exhibiting territorial behavior. One on the lower end of Chattam Island on the upper end of Long Island/Barns Island complex near the confluence of Bear Creek (r.m. 341.3 – GPS 15T 0629191 UTM 4439796 see Map #4). Another on Long Island just across from Libby Island (r.m. 334 – GPS 15T 0631519 UTM 4431104 see Map #5).

Bay de Charles – r.m. 311-312 – Missouri Side – searched on three occasions– no RSH present.

Huron Island – r.m. 422-425 – no searches conducted.

Fabius River confluence & Orton Island – r.m. 323 – Missouri side – preliminary search conducted

North River confluence – r.m. 321 – Missouri side – preliminary search conducted.

Table 6. List of birds heard or seen from the sample plots in Pools 21 and 22 of the Mississippi River. Site #1 & #2 Sny River/Shaffer Island Complex, #3 Beebe Island/Mill Creek Complex, #4 Ward Island, #5 Bear Creek Complex. See Maps 2-5 for description of site locations.

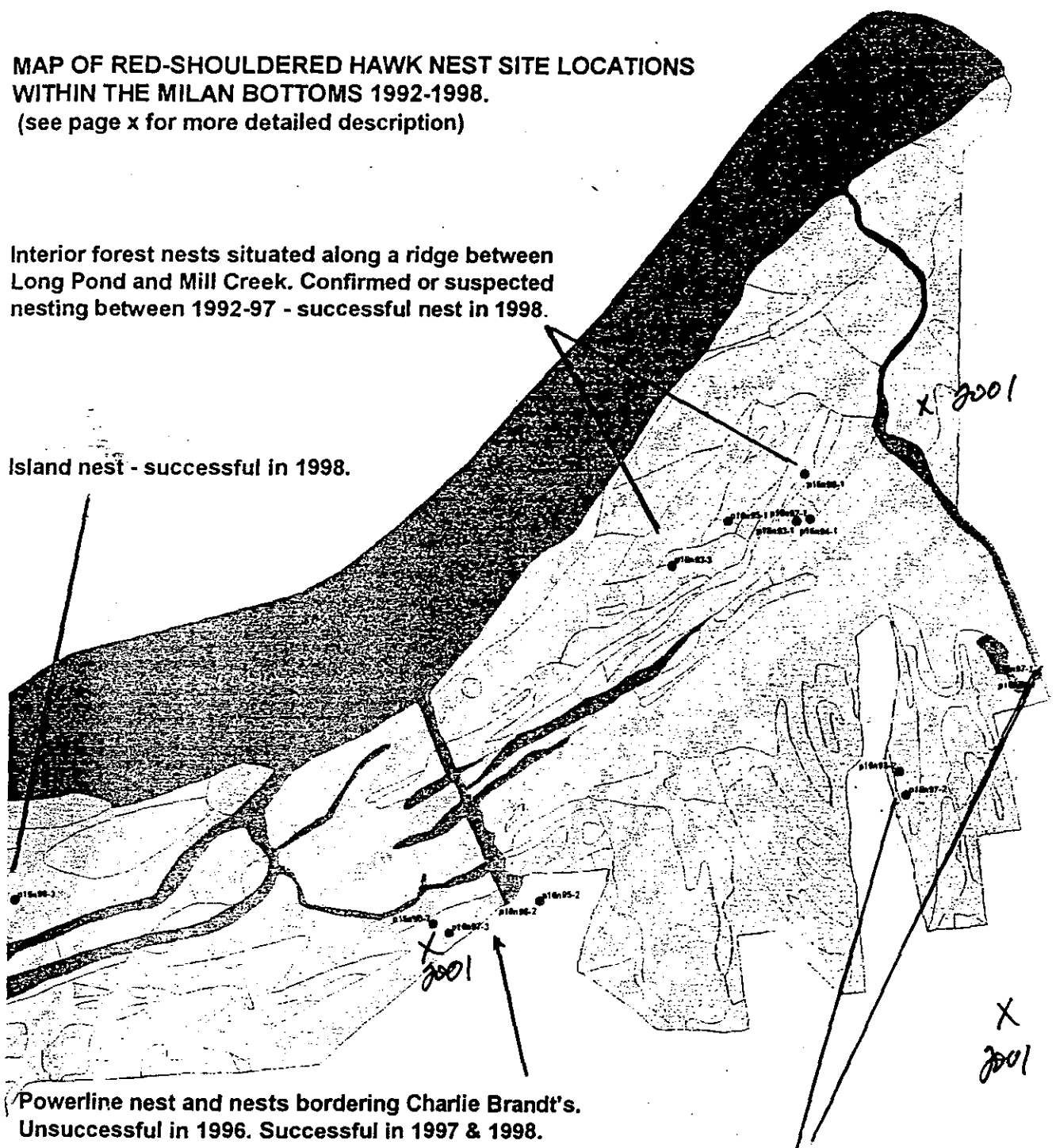
	#1	#2	#3	#4	#5
Great Blue Heron	x	x	x	x	x
Green Heron		x			x
Double-crested Cormorant			x		x
Mallard	x	x	x	x	x
Wood Duck	x	x	x	x	x
Turkey Vulture	x		x		x
Red-tailed Hawk	x				x
Red-shouldered Hawk			x		
Mississippi Kite					x
Killdeer					x
Spotted Sandpiper	x		x		
Mourning Dove	x				x
Yellow-billed Cuckoo	x	x	x		
Barred Owl		x			x
Great Horned Owl	x				x
Common Nighthawk					x
Chimney Swift			x	x	
Belted Kingfisher	x	x		x	x
Red-bellied Woodpecker	x	x	x	x	x
Red-headed Woodpecker	x	x		x	x
Northern Flicker			x		
Downy Woodpecker				x	
Hairy Woodpecker	x				
Pileated Woodpecker		x	x	x	x
Eastern Phoebe	x				x
Eastern Wood-Pewee	x	x	x	x	x
Acadian Flycatcher	x		x	x	
Great Crested Flycatcher		x		x	
Flycatcher (sp)		x			x
Barn Swallow				x	
Tree Swallow	x		x		x
Rough-winged Swallow			x		x
Crow	x	x	x	x	x
Blue Jay	x			x	
Eastern Tufted Titmouse	x	x	x		x
Black-capped Chickadee	x				x
White-breasted Nuthatch		x		x	
Brown Creeper	x			x	x
Carolina Wren	x				
House Wren	x				x
Blue-gray Gnatcatcher		x			
American Robin	x	x	x	x	x
Wood Thrush				x	x
Gray Catbird					x
European Starling	x	x	x	x	x
Cedar Waxwing	x				
Warbling Vireo	x	x	x	x	x
Yellow-throated Vireo		x			x
Red-eyed Vireo	x				x
Northern Parula					x
Prothonotary Warbler	x	x	x	x	x
Common Yellowthroat					x
American Redstart	x	x	x	x	x
Northern Cardinal	x		x		x
Indigo Bunting					x
Song Sparrow	x				x
American Goldfinch	x			x	
Common Grackle	x	x	x	x	x
Red-winged Blackbird	x			x	x
Brown-headed Cowbird	x		x	x	x
Baltimore Oriole	x	x	x	x	x
Species unknown		x		x	

**MAP OF RED-SHOULDERED HAWK NEST SITE LOCATIONS
WITHIN THE MILAN BOTTOMS 1992-1998.**

(see page x for more detailed description)

Interior forest nests situated along a ridge between Long Pond and Mill Creek. Confirmed or suspected nesting between 1992-97 - successful nest in 1998.

Island nest - successful in 1998.



Powerline nest and nests bordering Charlie Brandt's.
Unsuccessful in 1996. Successful in 1997 & 1998.

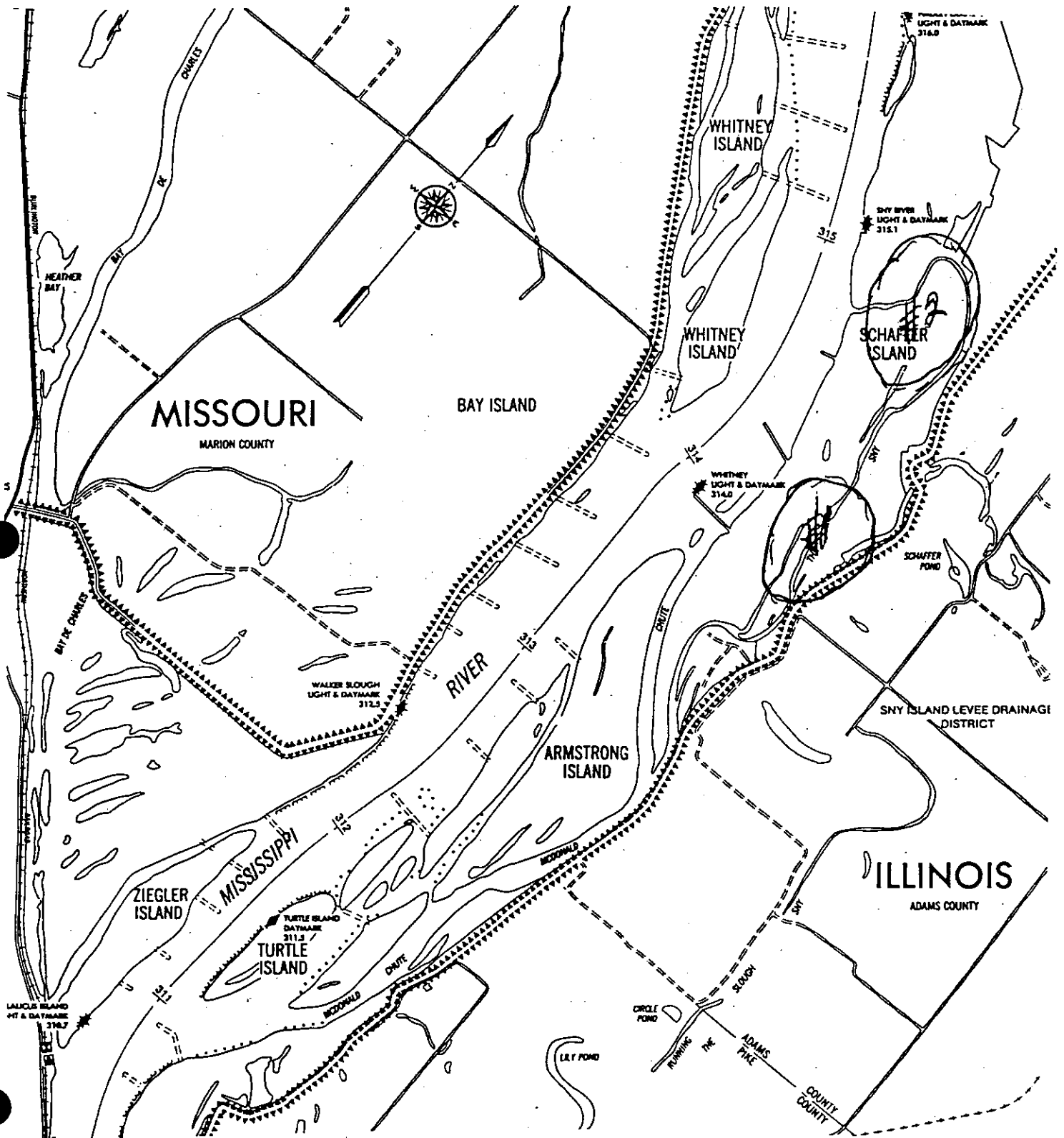
Gun Pond and Mill Creek Berm Nests.
At least one of these locations was
active each year from 1993-1997.
None active in 1998.

Map 1. Shows the location of the Red-shouldered Hawk nesting attempts
within the Milan Bottoms in 2001.

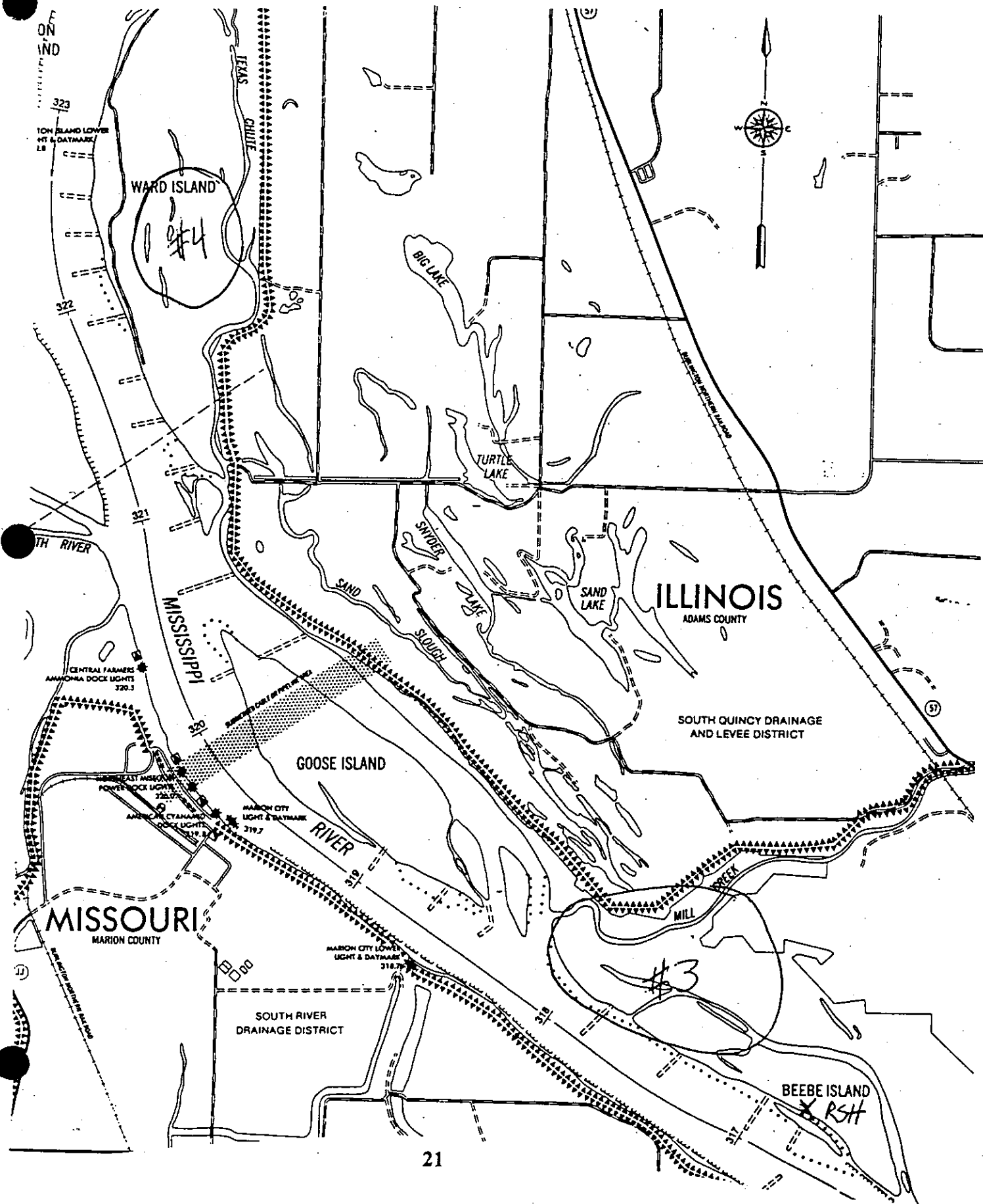
X = RSH nests in 2001.

Red dots indicate nesting locations during previous years.

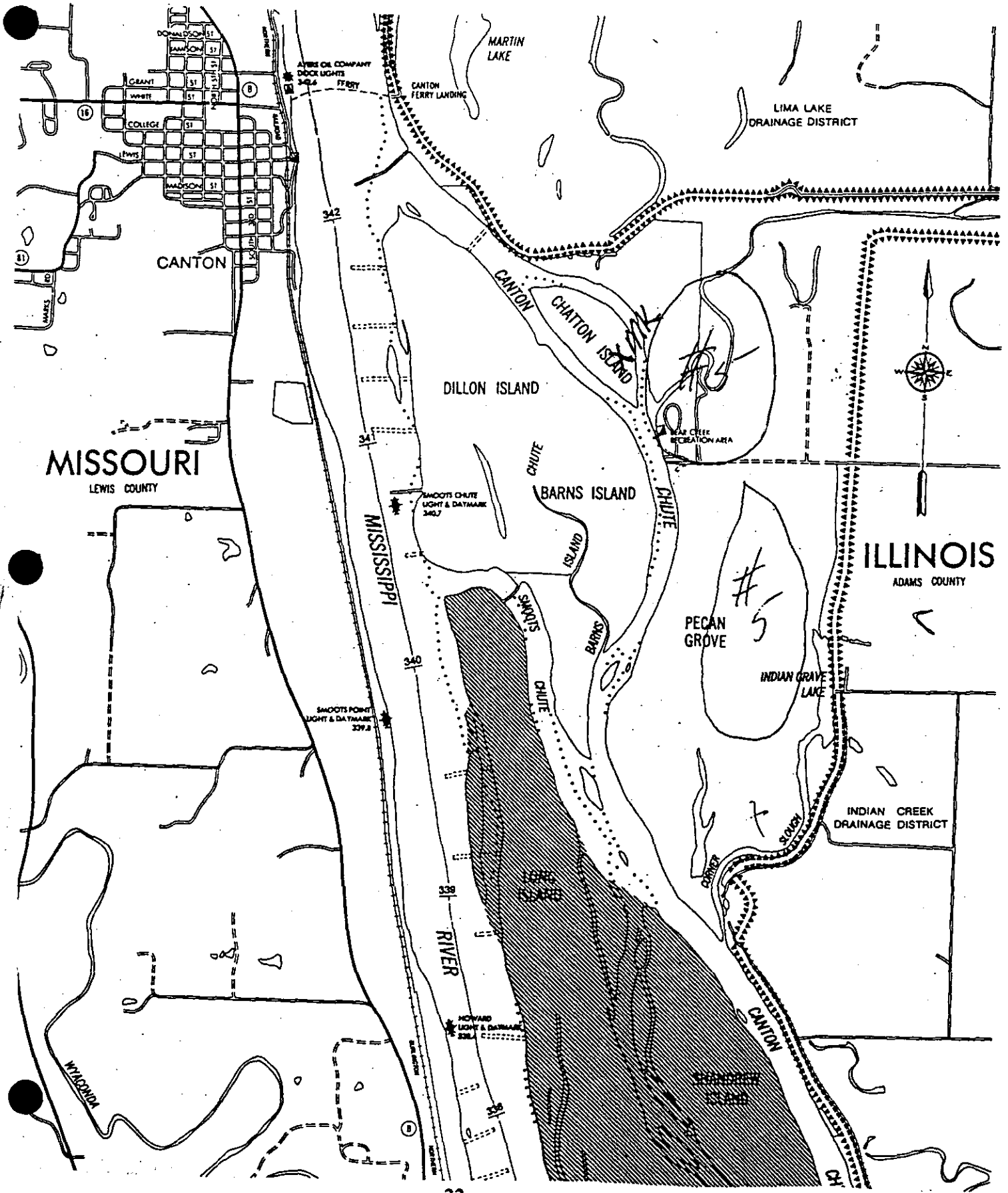
Map 2. Shows sites #1 & #2 where birds were sampled in the Sny River/Shaffer Island Complex. See Table 6 for results.



Map 3. Shows site #3 in the Beebe Island/Mill Creek Complex and site #4 on Ward Island. X RSH denotes the location of the Red-shouldered Hawk observed. See Table 6 for results.



Map 4. Shows site #5 in the Bear Creek/Chattom Island Complex.
 X MK denotes the location of a pair of Mississippi Kites observed.
 See Table 6 for results.



Map 5. Shows the location of a pair of Mississippi Kites (X-MK).

