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REPORT ON RED-SHOULDERED HAWK INVENTORIES AND MONITORING IN THE MILAN BOTTOMS – YEAR 2002

Submitted to:

Illinois Department of Natural Resources,
Wildlife Preservation Fund

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

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RESEARCH OBJECTIVES

1. Search previously active Red-shouldered Hawk nesting sites and potentially new nesting sites within the Milan Bottoms/Mill Creek study area.

2. Monitor the progress at known Red-shouldered Hawk nesting attempts within the Milan Bottoms and determine their reproductive success.

3. Compare Red-shouldered Hawk reproductive success during the year 2002 within the Milan Bottoms with those found in other areas of the Mississippi River, and compare Red-shouldered Hawk reproductive success in 2002 with those found in previous years.

4. When possible, search for potential Red-shouldered Hawk nesting sites within selected portions of Pools 21 and 22, and investigate Mississippi Kite nesting on the Long Island Complex.

RATIONALE FOR PROPOSED RESEARCH

1. Red-shouldered Hawks are considered endangered in Illinois and the Milan Bottoms is one of the few established nesting sites within this region. Red-shouldered Hawks are listed as a species of concern in Missouri. There are no documented nesting sites that we know of in Pools 21 & 22.

2. Red-shouldered Hawks are indicators of high quality habitat and are considered an "Umbrella Species." They prefer large tracts of mature floodplain 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 which may be more difficult to monitor.

3. Our understanding of habitat requirements for Red-shouldered Hawks has increased and changed somewhat during the last five years. 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 Hawks should reduce the potential for conflict with planned forest harvests in this region.

BACKGROUND - RED-SHOULDERED HAWK POPULATIONS

At the time of European settlement, Red-shouldered Hawks (*Buteo lineatus*) 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 the state (Brown 1964 & 1971; Roosa and Stravers 1989). Declines in other states in the Upper Midwest appeared to be similar (Bowles and Thom 1981; Hands et al 1989). Red-shouldered Hawks have been on the state endangered species list in Iowa since 1977 (Roosa 1977) and in Illinois since 1981 (Bowles and Thom 1981).

Red-shouldered Hawk population declines occurred during an era when pesticide contamination caused population declines in other raptors such as Peregrine Falcons (*Falco peregrinus*) and Bald Eagles (*Haliaeetus leucocephalus*) (Henny and 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 effect of persistent pesticides, or the specific population dynamics.

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 and McKay 1993). During the past fifteen years, there has been an apparent increase in the number of Red-shouldered Hawk sightings in the field reports from ornithologists in some parts of Iowa and Illinois.

BACKGROUND ON THE MILAN BOTTOMS STUDY AREA

The Milan Bottoms/Mill Creek study area consists of approximately 1200 acres in Rock Island County, Illinois, near the confluence of Mill Creek and the Mississippi River (river miles 476-478), between the towns of Milan and Andalusia. This area is just below the confluence of the Rock and Mississippi Rivers. Several small streams flow into each other and into the Mississippi River within the study area. There are several slightly elevated ridges within the study area that remain exposed during most flooding. However, the elevation of the study area is low enough so that much of it is under water during typical spring flooding.

Although there has been some selective timber harvests within the study area at various times in the past, there has been no large-scale timber production from this site. Tree age diversity and tree species diversity within the study area are perhaps as high as any of the floodplain forests along the Mississippi River in this region. The U.S. Army Corps of Engineers, , Natural Resources Management Section, Mississippi River Project, had planned to complete three small timber harvests for a total of 28 acres in 1994. Because of concerns about the effects on Red-shouldered Hawk nesting, plans for two of those cuts were abandoned. Instead, an 11 acre cut was completed in the western edge of the Milan Bottoms complex, and an additional 8 acre cut was also completed on a nearby island.

Since the timber harvests were completed, individuals from the Midwest Raptor Research Fund have been monitoring the raptor activity and reproductive success within the study area in order to determine the effects of small clear-cuts on Red-shouldered Hawk nesting success. The investigations for Red-shouldered Hawks within the Milan Bottoms have been conducted each year since 1992. These investigations are part of an on-going research and monitoring project on Red-shouldered Hawks conducted each spring since 1983.

During each year between 1998 and 2001, we documented three Red-shouldered Hawk nesting attempts with the Milan Bottoms study area. Reproductive success of Red-shouldered Hawk nesting within the Milan study area has varied. Since 1994, 67% of the known nesting attempts have been successful, which is similar to the overall percentage of success for Red-shouldered Hawk nests along the Mississippi River between 1983 and 2000.

METHODS

Methodology for Red-shouldered Hawk inventories generally followed the protocol used in previous years which was suggested by Craighead and Craighead (1956) and Fuller and Mosher (1987). 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. The initial ground searches were conducted in mid and late March prior to leaf-out, during the period when Red-shouldered Hawks are the most vocal. In areas with the highest potential, we spent additional hours using a "wait and listen" technique.

All areas where we suspected Red-shouldered Hawk nesting were searched again in April, following the period when the birds usually lay their eggs. If we located active nests, they were visited periodically during the nesting cycle to document progress and determine productivity. If we were unable to locate the actual nest during these initial visits, but we still felt that the area was an active territory, we waited until after the young Red-shouldered Hawks were nearing fledging age. Then, we searched the territory again since the adults are more frequently vocal during this period.

All observations during this study were conducted in a manner that minimized the disturbance to the nesting hawks, and the duration of the visits to active nests was kept to a minimum. We continued to monitor the activity of the young Red-shouldered Hawks at some nesting sites during the post fledging period between mid-June and early-August. All known active raptor nests and suspected breeding territories were plotted as GPS points on aerial photos.

SCHEDULE OF OBSERVATIONS

TIME PERIOD	ACTIVITY
Last three weeks in March	Searched the study areas for Red-shouldered Hawk territorial activity and potential nesting sties. Red-shouldered Hawks are usually vocal during this period, commonly identifying their main territory.
Mid-April to mid May	Determined which Red-shouldered Hawk nests were active. Monitored the active nests. Red-shouldered Hawks are usually quiet during this time.
Early June	Determined reproductive success and monitored nestling activity. Searched areas of suspected nesting where we did not locate nests during initial visits. Both adult and juvenile Red-shouldered Hawks are vocal during this period.

RESULTS

Between March and July of 2002, searches were conducted on 13 days for evidence of Red-shouldered Hawks nesting along the Mississippi River in the Milan Bottoms. We confirmed two active nests, and we suspected one other pair of attempting to nest within the Milan Bottoms. Of these, one nesting attempt produced young and one nesting attempt was abandoned during the early portion of the nesting season.

During the early portion of the breeding season (early March until early April) we observed the usual amount of Red-shouldered Hawk activity, which included territorial calling and potential nest building in three locations. This included the area east of the lower portion of Mill Creek and north of Kickapoo Slough (see Map). We are uncertain of the outcome of this suspected nesting attempt. However, because of the lack of the Red-shouldered Hawk calling during our observations in May and June, we do not believe that any young were produced from the suspected nesting attempt on the east end of Mill Creek. We have not documented Red-shouldered Hawk nesting in this particular area in previous years.

LIST OF ACTIVE RED-SHOULDERED HAWK NESTING SITES WITHIN THE MILAN BOTTOMS STUDY AREA - 2002

Confluence of Mill and Warren Creek - 15T 0697836 UTM 4591536
This nest was discovered by Kelly McKay. This territory has been active for each of the past four years, and the nest tree was within 100 meters of last year's nest tree. At least one nestling reached fledging age in 2002.

Powerline - 15T 0695827 UTM 4591245 - 2001 and 2002 nest site.
This nest site has been active during the past 6 years. We observed Red-shouldered Hawk territorial activity in mid-March and the nest appeared to be refurbished at that time. However, during most of the month of April, the adjacent land-owner, Charlie Brandt, spent considerable time reconstructing a pond near the nest site (within 150 meters of the nest), and had heavy equipment operating for long periods. We found no Red-shouldered Hawk activity at or near this location on subsequent visits. We conducted additional observations in this area in May and June in hopes of hearing Red Shouldered Hawks calling in nearby areas (which may have indicated this pair had re-nested in some nearby location).

Cooter Slough - 15T 0695351 UTM 4591330 - new nest built in 2002.
A new nest was constructed close to the previous nesting location used in 1999, and birds were in the area during the early portions of the breeding season. However, similar to the Powerline territory, no Red-shouldered Hawks were observed in this area after the 10th of April, and there was no evidence of successful reproduction at this site. This nest structure may actually be related to the Powerline territory and may have been an unused alternate nest of that same pair.

Mill Creek East
East of the lower portion of Mill Creek and north of Kickapoo Slough.
We heard RSH calling in this area during the early portion of the breeding season. Although we conducted some searches in this area, our searches during the early part of the nesting season before leaf-out were hampered by high water. We did conduct additional searches after leaf-out, but searches during this time period are not particularly effective because of the lack of visibility.

RESULTS - POOLS 21 & 22

During 2002, we conducted searches on three days in Pools 21 & 22. We checked several areas along Long Island and near Mill Creek and Beebe Island. This was the second year of specific investigations for Red-shouldered Hawks in these two pools. However, our observations during both years where rather limited due to time, weather, and water levels, and the distance we had to travel in order to conduct searches in this area. We did not observe any Red-shouldered Hawks in 2002. We do feel, however, that there are suitable forest tracts and good potential for Red-shouldered Hawk nesting in Pools 22 & 22 (see Discussion section).

Mississippi Kites

We observed Mississippi Kites (*Ictinia mississippiensis*) in 2001 and again in 2002 on Long Island. Kites were also reported by other biologists working in the area. We did not confirm the location of any active nests. However, because of the number of sightings, which included multiple birds, and because of the repetition and the timing of the sightings, and because of the suitability of the habitat, we suspect that there may be Mississippi Kites nesting on Long Island. Perhaps a small colony has been initiated since there were multiple birds sighted and this species often nests in small colonies.

DISCUSSION

MILAN BOTTOMS

Although we observed the typical amount of Red-shouldered Hawk activity during the early portion of the nesting season, we observed very little activity after mid-April. We believe that only a single young Red-shouldered Hawk reached fledging age. This is the second consecutive year of low reproductive success in the Milan Bottoms.

Extended periods of high water can have a detrimental affect on Red-shouldered Hawk reproductive success. However, water levels during early spring of 2002 were not unusually high. The highest water occurred in early June. By this time, at least one of the Red-shouldered Hawk territories had already been abandoned. Most likely, the most detrimental affect during 2002 was the construction activity that took place throughout the month of April on the Charlie Brandt property, which is adjacent to one of the established nesting sites within the Milan Bottoms.

In recent years, Red-shouldered Hawk reproductive success within the Milan Bottoms has been fairly reliable. However, in 2001 only one nest produced young. That may, or may not, have been a factor in some of the unoccupied territories in 2002. Reproductive success within the Milan Bottoms in 2002 was the poorest we have documented since 1996.

Interestingly, reproductive success of Red-shouldered Hawks within the Milan Bottoms has been equal to, or better than, the reproductive success of Red-shouldered Hawks in the other districts during the past 6 years. However, during 2002 reproductive success within the Milan was lower than in other district where we monitored. For example, four of five active nests within the McGregor District were successful and averaged 2 nestlings reaching fledging age per successful nest.

Pools 21 & 22

From these rather brief observations during 2001 and 2002, and from observations of Red-shouldered Hawks in stretch of the Mississippi River 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 Pools 22 & 22. This stretch of the river has extensive forests with suitable age and structural diversity, which appear to 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 reoccupation.

The river and the floodplain in this district are greatly influenced by a system of levees. This appears to have a significant impact on Red-shouldered Hawk nesting densities and on nest site selection. It appears that extensive levee systems in Pools 22 & 22 effectively eliminate significant amounts of suitable wetland foraging habitat. Because agricultural land generally is immediately adjacent to the levees, this creates an increase in the "edge effect" and generally results in a more favorable situation for the more common Red-tailed Hawks.

In summary, we expect lower densities of nesting Red-shouldered Hawks in Pools 21 & 22. However, there is reason to suspect that there may be several active Red-shouldered Hawks nesting territories within this stretch of the Mississippi River.

RECOMMENDATIONS

Our observations of Red-shouldered Hawk nesting within the Milan Bottoms initially began in 1992, with a more concerted effort starting in 1993. With the support of the USCOE Natural Resources Management Section, and the Illinois DNR, we have been able to continue these observations each season since then. At some point, we should summarize our findings during these past eleven years and publish a summary report.

We could "draw that line" at the end of this field season. However, because of the poor reproductive success during the past two years, we feel that 2003 will be a good test case for the Milan Bottoms as a sink or source habitat for Red-shouldered Hawk populations. If we are able to document two or three nesting attempts in 2003, then the Milan Bottoms will more or less have proven itself as an established site for multiple Red-shouldered Hawk nesting territories.

In Pools 21 & 22, the observations for an active Mississippi Kite colony should be continued. Or at least, biologists working in the area should be aware of the potential. 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. We hope to do some additional searches of this area in October and November of 2002. The Kites will most likely have migrated out of the area, but we may be able to search for nest structures that were used in the spring of 2002.

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- Midwest Raptor Research Fund.

LIST OF FIELD ASSISTANTS AND RESPONSIBILITIES

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Kelly McKay - field investigations

Volunteer Field Assistants
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Robert Klein, Pella, Iowa

Agency participants
Gary Swenson, Joe Lundh and Al Froelich from the U.S. Army Corps of Engineers, Natural Resources Management Section, Mississippi River Project, Rock Island District.

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RED-SHOULDERED HAWK NEST SITE DATA - 2002

NEST SITE NAME: Wayne's - Confluence of Warren Creek & Mill Creek
USF&WS DISTRICT: Wapello **POOL:** 16
UTM: 15T 0697836 UTM 4591536
QUAD: Andalusia **SEC:** 20 **TWNSHP**: 17N **RANGE:** 2W

LOCATION WITHIN POOL: UPPER **STATE:** Illinois
OWNERSHIP: private – this could be on Wayne Scherman's property but not certain.
ACCESS: walk in from Wayne Scherman's - during extremely high water, it is possible to boat up Mill Creek - nest is near Sand/Mill Creek confluence.

STATUS 2002: active - successful - at least one nestling reached fledging age
OBSERVATIONS 2002:
3/22 – RSH present in the general vicinity but nest does not look tended – Cooper's Hawk also in area
5/22 – RSH calling – but nest not located
4/15 - Kelly McKay located nest which is west of 2001 nest.
4/19 - Adult still sitting on the nest
6/05 – RSH calling – one youngster still in the nest and looking healthy

SUMMARY OF INFORMATION FROM PREVIOUS YEARS:
Between 1992 and 2001, several different nesting sites have been used within this particular section of the Milan Bottoms - sometimes on the Mill Creek Berm - sometimes the west side of Mallard Pond.
The 2002 nest is only 160 meters west of the 2001 nest.

NEST TREE SPECIES: Silver Maple **DBH:** medium
HEIGHT OF NEST ABOVE GROUND: 75 feet **HEIGHT OF TREE:** 90 feet +
EDGE OF SIDE CHANNEL: **CREEK:** 140m from Warren Creek
AG LAND: ?
NEAREST ACTIVE RSH NEST: 1.26 miles to Powerline/Charlie's
NEAREST KNOWN RTH NEST: ?

FOREST STRUCTURE, SIZE, AND DIVERSITY:
The nest is situated in the oldest section of the outer triangle which is bordered by Mallard Pond, Mill Creek, Sand Creek. Mostly silver maple, but some cottonwood, green ash, willow, hackberry and a few oaks.

UNDERSTORY & GROUND LAYER: typical: outer portion slightly drier.

COMPARATIVE ELEVATION OF NEST SITE: driest RSH nesting of the three active sites.
Forest south of Sand Creek is dying, apparently from too much water - wetlands across Mill Creek - Mallard Pond and associated wetlands are within 1/3 mile.

ADDITIONAL COMMENTS: private property nest - one of only a few.
This appears to be a "logical" nest site location in the outer triangle/Mill creek berm. Some years there has been a Cooper's Hawk nesting attempt in this area – in 2001 there was a Cooper's in the vicinity in March and April but no evidence after the water came up. Thick forest canopy in this area - a hard nest to view.

RED-SHOULDERED HAWK NEST SITE DATA - 2002

NEST SITE NAME: Charlie Brandt's - Powerline
USF&WS DISTRICT: Wapello **POOL:** 16
UTM: 15T 0695827 UTM 4591245
QUAD: Andalusia **SEC:** 19 **TWNSHP**: 17N **RANGE:** 2W
LOCATION WITHIN POOL: UPPER **STATE:** Illinois
OWNERSHIP: USCOE
ACCESS: walk in from Charlie's - or boat in along Power Line road nest is just north of USCOE property line - just west of the little angle cut through Charlie's east woods.

STATUS 2002: active - failed - nest abandoned
OBSERVATIONS 2002:
3/02 – RSH calling in the general vicinity of the powerline/Turkey Hollow/Charlie's
3/29 – RSH calling in the immediate nest vicinity – nest looks recently tended.
April - No RSH in area - heavy equipment in operation on two visits in April.
May - no evidence of RSH at nest and no calling heard anywhere within the vicinity
June - no evidence of RSH at nest and no calling heard anywhere within the vicinity

SUMMARY OF INFORMATION FROM PREVIOUS YEARS:
active and successful in 1997 and 1998 (two nestlings each year)
failed in 1999 – successful in 2000 - failed in 2001.

NEST TREE SPECIES: Green Ash **DBH:** 19"
HEIGHT OF NEST ABOVE GROUND: 72 feet **HEIGHT OF TREE:** 88 feet
EDGE OF MAIN CHANNEL: 250m
EDGE OF SIDE CHANNEL: 150m **POND/LAKE:** 50m
AG LAND: 150m
NEAREST ACTIVE RSH NEST: 1.26 mile - Warren/Mill Creek

FOREST STRUCTURE, SIZE & DIVERSITY: medium aged - nothing really old in the immediate area. connected to the big forests, but the immediate forest size is rather small.

UNDERSTORY & GROUND LAYER: typical
COMPARATIVE ELEVATION OF NEST SITE: low site - the available dry ground is in ag fields.
EXTENT OF WETLANDS: wetland ponds all around.

KNOWN OR ESTIMATED HISTORY OF MANAGEMENT AT THE SITE:
This site was most likely reforested at the time of acquisition. The nest is situated relatively close to the timber 1994 harvest.

ADDITIONAL COMMENTS:
We assume this nest failure was caused by the consistent disturbance resulting from the heavy equipment being operated in the immediate area during April.

RED-SHOULDERED HAWK NEST SITE DATA - 2002

NEST SITE NAME: Cooter Slough/Lower Milan Bottoms
USF&WS DISTRICT: Wapello **POOL:** 16 **RIVER MILE:** IL-476
UTM: 15T 0695827 UTM 4591245
QUAD: Andalusia **SEC:** 19 - SW1/4 **TWNSHP**: 17N **RANGE:** 2W
LOCATION WITHIN POOL: UPPER **STATE:** Illinois
OWNERSHIP: USF&WS/USCOE **ACCESS:** walk in from Charlie Brandt's, or boat from Swift Slough/Cooter Slough; nest tree is situated south and a little east of the delapidated duck blind on northwest edge of pond.

STATUS: uncertain
OBSERVATIONS 2002:
03/ a single RSH present and calling - newly refurbished nest nearby.
4/06 - nest relocated - no RSH observed

SUMMARY OF INFORMATION FROM PREVIOUS YEARS:
This site was active in 1999 and another site just across the slough was active in 1998.
Inactive in 2000 and 2001.

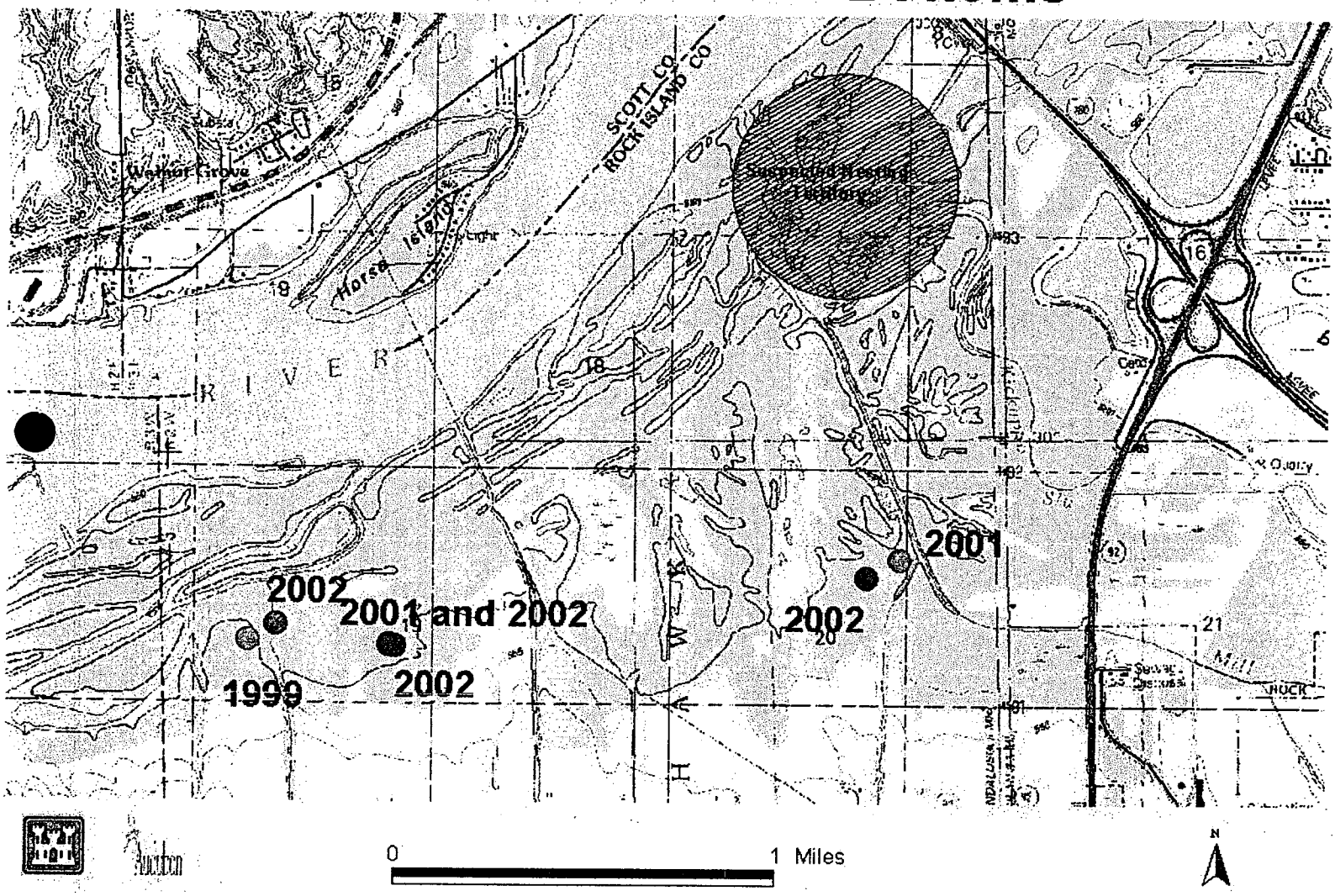
NEST TREE SPECIES: Green Ash **DBH:** 19.1
HEIGHT OF NEST ABOVE GROUND: 50 ft **HEIGHT OF TREE:** 80 ft (est.)
EDGE OF SIDE CHANNEL: 120m **POND/LAKE:** 60m
AG LAND: 120m (?) **HUMAN STRUCTURE:**

FOREST STRUCTURE, SIZE & DIVERSITY: This site is on the lower end of the Milan Bottoms, and the nest tree is situated in a rather narrow portion of the forest. Mostly silver maple/cottonwood/green ash - relatively young forest compared to most RSH nest sites. Huge silver maple wolf tree nearby.

UNDERSTORY & GROUND LAYER: typcial nettles, ivy, grasses.

EXTENT OF WETLANDS: good - some higher quality but small wetlands to the west of the nest.

COMPARATIVE ELEVATION OF NEST SITE: low site - no real elevation available in the vicinity.

KNOWN OR ESTIMATED HISTORY OF MANAGEMENT AT THE SITE:
probably an old field that reverted to forest at the time of acquisition.

2002 Red-shouldered Hawk nesting sites within the Milan Bottoms