

**REPORT ON RED-SHOULDERED HAWK INVENTORIES  
AND MONITORING IN THE MILAN BOTTOMS AND  
LOWER WAPSIPINCON RIVER – YEAR 2003**

**Submitted to:**

**Illinois Department of Natural Resources,  
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Natural Resources Management Section,  
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**Quad Cities Audubon Chapter**

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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 and the lower Wapsipinicon River study areas.
2. Monitor the progress at known Red-shouldered Hawk nesting attempts within the two study areas and determine their reproductive success.
3. Compare Red-shouldered Hawk reproductive success during the year 2003 within the Milan Bottoms with those found in other areas of the Mississippi River, and compare Red-shouldered Hawk reproductive success in 2003 with those found in previous years.

## **RATIONALE FOR PROPOSED RESEARCH**

1. Red-shouldered Hawks are considered endangered in Illinois and Iowa. The Milan Bottoms is one of the few established nesting sites with continued documented nesting within this reach of the Mississippi River. Currently, there is evidence of Red-shouldered Hawk nesting sites within the lower portion of the Wapsipinicon River, but the nesting locations and reproductive success have not been documented.
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 high nest-site fidelity, often returning to the same nesting territory 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 are, in some ways, 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 IN THE UPPER MIDWEST**

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). Their populations declined due to fragmentation and clearing of flood plain forests, the conversion of flood plains into cropland, and the channelization of streams. This 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; Bednarz & Dinsmore 1981; 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 (field reports in the Iowa Ornithologist Union Journal). We are not certain if this represents a specific increase in the number of Red-shouldered Hawks, or rather an increase in the effort by field ornithologists. Quite likely, it is a combination of both of these factors.

## **BACKGROUND:**

### **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 in 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 these timber harvests were completed, we have monitored 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 (Stravers & McKay 1993 & 1998). These investigations are part of an on-going research and monitoring project on Red-shouldered Hawks conducted each spring since 1983.

## 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 and listened for Red-shouldered Hawks 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. In previous years 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. Since there were no known active nests in 2203, our observations during late June to early August were aimed at listening for young Red-shouldered Hawk.

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 sites. Red-shouldered Hawks are usually vocal during this period, commonly identifying the center of their territorial activity.
Mid-April to mid May	Determined which Red-shouldered Hawk nests were active and 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 2003, searches were conducted on 13 days for evidence of Red-shouldered Hawks nesting along the Mississippi River in the Milan Bottoms and the lower portion of the Wapsipinicon River. We confirmed two active nests in the Milan Bottoms and one active nest in the lower portion of the Wapsipinicon River. We suspect at least one other nesting attempt in each of the two study areas.

Although we were able to confirm Red-shouldered Hawk activity within the Milan Bottoms in 2003, it appears that both nesting attempts failed; we were unable to verify any successful reproduction from the known nesting sites within the study area. We did spend the usual amount of time in the Milan Bottoms study area during June when the young are usually quite vocal. During June of 2003 we were unable to confirm the presence of any recently-fledged Red-shouldered Hawks anywhere within the Milan Bottoms study area.

### LIST OF ACTIVE RED-SHOULDERED HAWK NESTING SITES - MILAN BOTTOMS STUDY AREA - 2003

#### **Confluence of Mill and Warren Creek - 15T 0697836 UTM 4591536**

This territory has been active for each of the past five years, and the same nest that was used in 2002 was used again in 2003. A pair of Red-shouldered Hawks were present and/or observed on the nest on at least 5 occasions during the spring of 2003. We are quite certain that one of the RSH involved in this nesting attempt was only a second year bird. Although we found RSH present throughout the entire breeding season, we found no evidence of successful nesting at the end of the nesting cycle at this location. (see Discussion section for more details).

#### **Kickapoo Slough - 15T 0698367 UTM 4592094**

New nest site location. We confirmed RSH incubating at this site in April but by mid-May we found no evidence of continued nest occupation.

#### **Powerline - 15T 0695827 UTM 4591245 - 2001 and 2002 nest site. (not active in 2003)**

This nest site had been active during the past 6 years. We observed Red-shouldered Hawk territorial activity in mid-March. However, after mid-March no other RSH activity was observed in this general area. Construction activity on adjacent private property west of the nesting site and the USCOE project to re-channel the creek east of the nesting site may have influenced the RSH to abandon this nesting site.

#### **Kickapoo Slough -**

East of the lower portion of Mill Creek, east and north of Kickapoo Slough. Although we did not confirm any RSH nesting in this location, we did hear adult RSH calling on a couple of occasions. This area is private property and consequently our searches in 2003 and in previous years have been incomplete.

## **RESULTS - WAPSIPINICON RIVER STUDY AREA - 2003**

Between March and July of 2003, searches were conducted on five days for evidence of Red-shouldered Hawks nesting along the lower portion of the Wapsipinicon River. We confirmed one active nest and we suspected at least one other active nest in the lower portion of the Wapsipinicon River. We suspect successful reproduction at the known nesting site but we were unable to visit the nesting site during mid-June to verify successful RSH reproduction from this study area.

We also conducted similar investigations (approximately 15 miles and 30 upriver) at the Barber Creek and Syracuse Wildlife area. At these sites we confirmed that Red-shouldered Hawks were present and exhibiting territorial behavior. We did not confirm nest locations but we did observe recently fledged Red-shouldered Hawks in July (suggesting reproductive success). From our observations this year and in previous years we consider these two areas to be important Red-shouldered Hawk habitat and most likely have continued Red-shoulder occupation.

### **RED-SHOULDERED HAWK NESTING SITES - WAPSIPINCON STUDY AREA 2003**

Lower Wapsi - 15T 0720368 UTM 4624206

New nest site is located on the north side of the Wapsipinicon River and west side of railroad bridge. We assumed this was an active nest in mid-April. In May we found considerable amounts of whitewash below the nest and both adults were present. However, we were unable to conduct searches in this area in June to confirm the number of young to reach fledging age.



## **SUMMARY OF RSH REPRODUCTIVE SUCCESS - MILAN BOTTOMS 1992-2003**

The number of nesting attempts we confirmed in the Milan Bottoms study area varied from year to year between 1992 and 2003. We confirmed three attempts in 1998, 1999 and 2000, and two attempts in 2001, 2002, and 2003. We confirmed a total of 28 Red-shouldered Hawk nesting attempts between 1992 and 2003, and we were able to determine the outcome of 24 attempts. Of these, 12 were successful (50%), and 21 nestlings reached fledging age (1.75 per successful nest and 0.875 per nesting attempt). This success rate is lower than the average rate we found at the other known Red-shouldered Hawk nesting sites along the Mississippi River between 1983 and 2003. During that period, we determined the outcome of 114 Red-shouldered Hawk nesting attempts (average of 4.95 per year). Of these, 72 were successful (63.16%) and 158 nestlings reached fledging age (average of 2.19 per successful nest, or 1.38 per nesting attempt). Success rates varied from year to year, with a high of 88% to a low of 33% during the flood years of 1993 and 2001.

## **DISCUSSION - MILAN BOTTOMS**

Our effort and coverage of the Milan Bottoms study area during 2003 was similar to previous years. However, two of the known RSH nesting pairs moved nesting locations and the timing of some of our field observations was not optimal. We were unable to confirm the location of the third nesting RSH pairs, and our observations at the two active nests produced rather poor results in 2003.

Although we did not confirm the nest site location, we did spend the usual amount of time in the Milan Bottoms study area during June when the young are usually quite vocal. During June of 2003 we were unable to confirm the presence of any recently-fledged Red-shouldered Hawks within the Milan Bottoms study area.

Construction activity along the lower portion of Turkey Run Creek (USCOE 1135 project that diverted the flow of the creek away from the power line road and back to what is considered a more natural flow) may have affected RSH occupation of the nearby territory. This territory has been active for several years. There was also construction activity on private property just west of the historic RSH nest site location (on the Charlie Brandt property). This also may have had a negative impact on RSH nesting activity in this area.

We feel that our coverage of the area west of the I-280 bridge and east of the lower portion of Mill Creek in recent years has been incomplete. We have searched this area in previous years, but we did not consistently hear or see RSH in this section of the study area until 2003. (Also, this is private property and there are some trespass issues).

Red-shouldered Hawk reproductive success within the Milan Bottoms was fairly reliable between 1996 and 2000. However RSH reproductive success during 2001, 2002, and again in 2003 has been notably poor, or at least inconsistent, within the Milan Bottoms study area. It should also be noted that RSH reproductive success was also below average in Pool 10 of the Upper Mississippi River during 2003 (Stravers pers obs.).

One pair of RSH nesting within the Milan Bottoms study area involved a second year bird. Typically, breeding success is much lower when a juvenile (second year) bird is involved (Crocoll 1994; Palmer 1988; and pers obs).

## **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 perhaps "draw that line" at the end of this field season.

Due too the poor reproductive success during the past three years, we had hoped that 2003 would have been a good test case for the Milan Bottoms as a sink or source habitat for Red-shouldered Hawk populations. If we had been able to document two or three nesting attempts in 2003, then the Milan Bottoms would more or less have proven itself as an established site for multiple Red-shouldered Hawk nesting territories. However, due to the poor reproductive success during the past three seasons, we may have to consider that the Milan Bottoms as only suitable habitat for perhaps only a single or perhaps two pair of Red-shouldered Hawks.

We may need to redefine our methods and our investment in order to continue some kind of effort to monitor Red-shouldered Hawk presence within the Milan Bottoms. Perhaps it may suffice to determine Red-shouldered Hawk presence during the breeding season. The presence of Red-shouldered Hawks can be rather easily determined by visiting the study area during March and listening for adult Red-shoulders. We can assume that if breeding adults are in this habitat during the spring that there will be nesting attempt, and we may make the assumption that perhaps 50% of the nesting attempts will be successful. In other words, it may not be necessary to actually locate the active nests. This would make the investment in time and dollars at a more reasonable level and still provide us with at least some information on Red-shoulder presence in the Milan Bottoms.

Perhaps just as important, we feel there are other areas along the Upper Mississippi River where Red-shoulder investigations could be conducted. We feel there may be some other partnership potentials at other locations along the river.

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- Quad Cities Audubon Chapter

## **LIST OF FIELD ASSISTANTS AND RESPONSIBILITIES**

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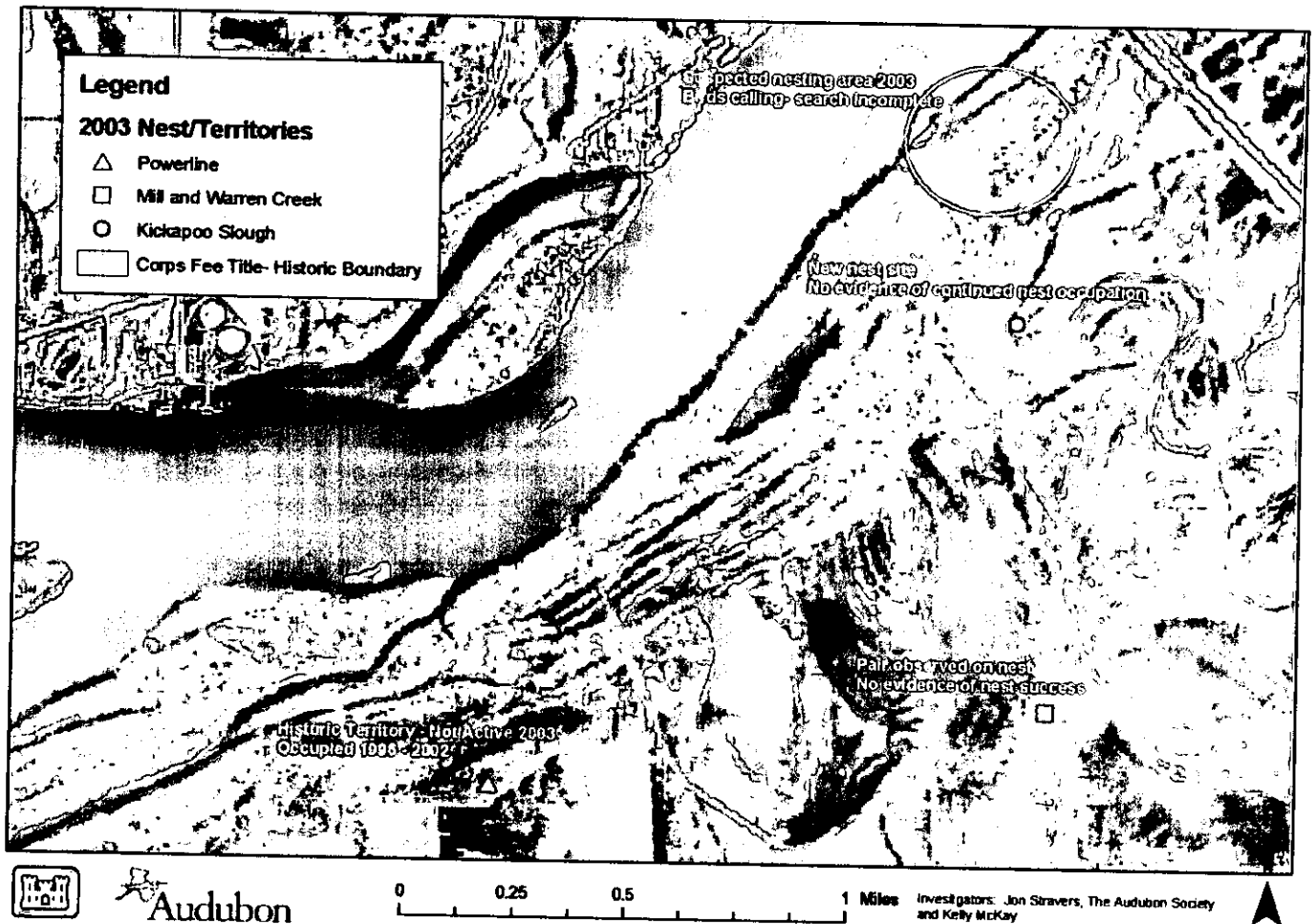
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**MAP OF RED-SHOULDERED HAWK NESTING SITES WITHIN THE MILAN BOTTOMS IN 2003.**

## **RED-SHOULDERED HAWK NEST SITE DATA - 2003**

**NEST SITE NAME:** Wayne's - Sand Creek/Mill Creek  
**USF&WS DISTRICT:** Wapello      **POOL:** 16      **RIVER MILE:**  
**UTM:** 15T 0697836 UTM 4591536  
**QUAD:** Andalusia      **SEC:** 20      **TWNSHP:** 17N      **RANGE:** 2W  
**LOCATION WITHIN POOL:** UPPER      **STATE:** Illinois  
**OWNERSHIP:** private

**ACCESS:** walk in from Wayne Scherman's - during extremely high water, it is possible to boat up Mill Creek, but during most water levels it will require a walk in from the log jam on Mill Creek. The nest site is near the Sand Creek/Mill Creek confluence.

**STATUS 2003:** active - unsuccessful

### **OBSERVATIONS 2003:**

RSH present in the general vicinity in March and April – nest looks tended  
Observed that one of the pair is an immature bird (2<sup>nd</sup> year). RSH present on five occasions during the breeding season, but no signs of young reaching fledging age.

### **SUMMARY OF INFORMATION FROM PREVIOUS YEARS:**

Several different nesting sites have been used within this particular section of the Milan Bottoms between 1992-2002; sometimes on the berm along Mill Creek - sometimes the west side of Mallard Pond. Same nest used in 2003 as 2002. Appears to be a rather reliable territory.

**NEST TREE SPECIES:** Silver Maple      **DBH:** medium  
**HEIGHT OF NEST ABOVE GROUND:** 75 feet      **HEIGHT OF TREE:** 90 feet +  
**EDGE OF SIDE CHANNEL:**      **CREEK:** 100m  
**AG LAND:** 500m      **HUMAN STRUCTURE:** within a mile of Wayne's farmhouse  
**NEAREST ACTIVE RSH NEST:** .94 mile – Kickapoo Slough  
**NEAREST KNOWN RTH NEST:** relatively close, but not measured  
**OTHER RAPTOR NEST:**      **NEAREST CROW NEST:** 18m

### **FOREST STRUCTURE, SIZE, AND DIVERSITY:**

Located 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 swamp white oaks.

**UNDERSTORY & GROUND LAYER:** typical floodplain vegetation – nettles, poison ivy, lersia, bottomland aster. Soil is a bit sandier in the immediate nesting area and the nest site lies within an outer portion of the study area which is slightly drier.

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

**ADDITIONAL COMMENTS:** private property nest - one of only a few. Some years there has been a Cooper's Hawk nesting attempt in this area.

## **RED-SHOULDERED HAWK NEST SITE DATA - 2003**

**NEST SITE NAME:** Kickapoo Slu/Mill Creek

**USF&WS DISTRICT:** Wapello      **POOL:** 16      **RIVER MILE:**

**UTM:** 15T 0698367 UTM 4592094

**LOCATION WITHIN POOL:** UPPER      **STATE:** Illinois

**OWNERSHIP:** USCOE

**ACCESS:** best to access by boat - or, walk in from along from the confluence of Mill Creek on the east (difficult during high water). East of Mill Creek and north of Kickapoo Slu

**STATUS 2003:** active – failed

### **OBSERVATIONS 2003:**

RSH present in the general vicinity in April – nest looks well tended.

By mid-May and again in mid-June, a single RSH was sighted in the immediate vicinity but it did not call and the nest appeared inactive. Considered this to be a failed nesting attempt.

### **SUMMARY OF INFORMATION FROM PREVIOUS YEARS:**

This area usually has considerable RSH activity but none of the nests that we have located east of Mill Creek in previous years have been successful. Several different nesting sites have been used within this particular section of the Milan Bottoms between 1992-2002, mostly on the west side of Mill Creek.

**NEST TREE SPECIES:** Silver Maple      **DBH:** medium

**HEIGHT OF NEST ABOVE GROUND:** 60 feet (approx)      **HEIGHT OF TREE:** 80 feet +

**EDGE OF SIDE CHANNEL:**      **CREEK:** 40m

**AG LAND:**      **HUMAN STRUCTURE:**

**NEAREST ACTIVE RSH NEST:**

**NEAREST KNOWN RTH NEST:** not known

### **FOREST STRUCTURE, SIZE, AND DIVERSITY:**

Mostly silver maple, but some cottonwood, green ash, willow, hackberry.

Bordered by younger trees to the east and open water to the south.

**UNDERSTORY & GROUND LAYER:** not recorded – water levels too high during all visits.

**COMPARATIVE ELEVATION OF NEST SITE:** fairly low site.

**ADDITIONAL COMMENTS:**



(Copy of the abstract presented at the Mississippi River Research Consortium in La Crosse, Wisconsin, in April of 2003).

## REPRODUCTIVE SUCCESS AND TERRITORY RE-OCCUPATION RATES FOR RED-SHOULDERED HAWK (*BUTEO LINEATUS*) WITHIN THE MILAN BOTTOMS

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Between 1992 and 2002, we collected information on Red-shouldered Hawk (*Buteo lineatus*) nesting within the Milan Bottoms study area which includes approximately 1300 acres of bottomland forest and wetland habitat along the Mississippi River just below the confluence of the Rock River in Rock Island County, Illinois. The study area is managed by the U.S. Corps of Engineers Natural Resources Management Section, although some of the perimeter habitats are in private ownership.

The number of nesting attempts we confirmed varied from year to year. We confirmed three attempts in 1998, 1999 and 2000, and two attempts in 2001 and 2002. We confirmed a total of 26 Red-shouldered Hawk nesting attempts between 1992 and 2002, and we were able to determine the outcome of 22 attempts. Of these, 12 were successful (57.1%), and 21 nestlings reached fledging age (1.75 per successful nest and 0.95 per nesting attempt). This success rate is slightly lower than the average rate we found at the other known Red-shouldered Hawk nesting sites along the Mississippi River between 1983 and 2002. During that period, we determined the outcome of 106 Red-shouldered Hawk nesting attempts (average of 5.3 per year). Of these, 69 were successful (65.1%) and 153 nestlings reached fledging age (average of 2.22 per successful nest, or 1.44 per nesting attempt). Success rates varied from year to year, with a high of 88% to a low of 33% during the flood years of 1993 and 2001.

Red-shouldered Hawk nesting sites were usually located in mature or medium aged forests and most of the nests were situated within 100 meters of a waterway or slough. Most nests were placed in areas where the overhead forest canopy was well developed. Active nests were placed in Silver Maples (*Acer saccharinum*) (78%), Eastern Cottonwood (*Populus deltoides*) (14%), and in Green Ash (*Fraxinus pennsylvanicus*) (8%). The diameter at breast height of the nest trees ranged from 16.9" to 32.6".

During the course of this study we have found that 89% of Red-shouldered Hawks breeding territories that we monitored along the Mississippi River were active in subsequent years. Because of this nest-site tenacity, we feel this species is an excellent "Umbrella Species" - an indicator of high quality habitat. 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.