

**REPORT ON RED-SHOULDERED HAWK INVESTIGATIONS WITHIN
THE MILAN BOTTOMS/MILL CREEK COMPLEX - 1992-1998.**



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**The Natural Resources Division of the U.S. Army Corps of Engineers
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ABSTRACT / EXECUTIVE SUMMARY

Investigation for Red-shouldered Hawk (*Buteo lineatus*) nesting were conducted each spring from 1992-1998 within the Milan Bottoms along the Mississippi River near Rock Island, Illinois. Three timber harvests for a total of 28 acres were planned for 1994, but because of concerns about the affects on nesting red-shouldered hawks, which is listed as endangered in Illinois, plans for two of those cuts were abandoned. Instead, a single cut of 11 acres was completed in the western edge of the 1400 acre Milan Bottoms complex and additional 8 acre cut was completed on a nearby island that was considered low potential for Red-shoulder nest site habitat. We inventoried and monitored Red-shouldered Hawk reproductive success before, during, and after the timber harvest and found two and sometimes three pairs of Red-shoulders nesting within the study area. They used a variety of habitats and nest site locations ranging from large tracts of mature and "over mature" forest, to narrow strips of trees 40-60 years old along a waterway, as well as in medium age silver maple stands only a 150 meters from an 8-acre clear cut. Reproductive success varied from two known nests both failing, to three successfull nests. Between 1992 and 1998 we documented 16 attempts; 13 known outcomes, of which seven were successful, resulting in 12 fledglings for an average of 1.71 fledglings per successfull nesting attempt or 0.92 fledglings per nesting attempt. The study area is part of refuge lands owned by the U.S. Army Corps of Engineers and managed by the USCOE Natural Resources Division and the Illinois Department of Natural Resources under a cooperative agreement with the U.S. Fish & Wildlife Refuge Mark Twain District.

RESEARCH OBJECTIVES

1. Monitor the known Red-shouldered Hawk nesting sites and search for new nesting sites within the Milan Bottoms/Mill Creek study area and determine the reproductive success at all of the known Red-shouldered Hawk nesting sites within the study area
2. Compare results at nest sites within the interior portion of forest tracts and those nest sites situated on the forest edge. Compare results at nest sites near the timber harvests and those within the forest interior.
3. Collect baseline information on Prothonotary Warbler and Pileated Woodpecker nesting and foraging within the Milan Bottoms Study area.

RATIONALE FOR PROPOSED RESEARCH:

1. Red-shouldered Hawks are considered endangered in Iowa and Illinois. Although some stretches along the Mississippi River have fairly high densities of nesting Red-shoulders, we have been able to locate only a handful of nesting sites south of Savannah, Illinois. We have documented Red-shoulder activity within the Milan Bottoms each spring since 1992, which makes this one of the few sites in the southern portion of the Red-shouldered Hawk Mississippi River range with a record of consistent occupation.
2. Red-shouldered Hawks are indicators of high quality habitat. They are usually found in association with large tracts of mature flood-plain forests, often in areas of relatively high species diversity. Red-shouldered Hawks have a strong nest-site fidelity, often returning to the same nest site each spring, and protection of Red-shouldered Hawk nesting habitat also provides habitat that is critical for several other passerine birds of special concern.
3. Our understanding of habitat requirements for Red-shouldered Hawks has increased during the last five years. However, there is insufficient data to allow us to understand the relationship between these hawks and a changing forest structure. Continued monitoring of Red-shouldered Hawk reproductive success can provide important information that could assist managers in maintaining species diversity.
4. Increased understanding of Red-shouldered Hawks should reduce the potential for conflict with planned forest harvests in this region.

BACKGROUND

The investigations conducted within the Milan Bottoms during 1998 were part of an on-going research and monitoring project on Red-shouldered Hawks along the Upper Mississippi River which have been conducted each spring since 1983. Investigations within the Milan Bottoms have been conducted each year since 1992. The U.S. Army Corps of Engineers Natural Resources Management Division had planned to complete three small timber harvests for a total of 28 acres in 1994. However, because of concerns about the affects on Red-shouldered Hawk nesting, plans for two of those cuts were abandoned and a single cut of 11 acres was conducted in the western edge of the Milan Bottoms complex, and additional 8-acre cut was completed on an adjacent island.

Since then, biologists from the Midwest Raptor Research Fund have been monitoring the raptor activity and reproductive success within the study area in order to determine the affects of small clear cuts on Red-shoulder nesting success. This report summarizes the findings for 1998. For more details and more extensive maps, interested readers should examine reports for 1995 and 1996, or the summary of Upper Mississippi River Valley surveys between 1983-1995 (available from the U.S. Army Corps of Engineers Natural Resources Division at Pleasant Valley, Iowa, or the Midwest Raptor Research Fund at P.O. Box 32, Pella, Ia 50219).

METHODS

Initial inventories for suitable Red-shouldered Hawk nesting areas were conducted using maps, aerial photos, and notes from previous searches in this region. We followed protocol suggested by Fuller and Mosher (1987), but had to adjust techniques according to water levels and access potentials. Previously known Red-shoulder nesting locations, areas of suspected nesting, and other areas of high potential were searched for evidence of Red-shouldered nesting. Several other randomly selected areas that were considered marginal habitat were also searched.

Searches in the most critical areas were conducted in March and April prior to leaf out. To assist in locating the hawks, taped calls were played in order to elicit a territorial response. All known active raptor nests and suspected breeding territories were plotted on topographic maps or aerial photos or Mississippi River Navigational charts. We also attempted to determine the history of forest management at each of the known Red-shouldered Hawk nesting sites.

Progress of the nesting attempts was monitored periodically from mid-March until mid-June when the young red-shoulders left the nest. These observations were conducted in a manner that minimized disturbances to the nesting hawks. Duration of the visits was kept to a minimum and observations were not conducted during inclement weather.

RESULTS - RED-SHOULDERED HAWK NESTING IN THE MILAN BOTTOMS - 1998

During our investigations in 1998, we located three active red-shouldered hawk nesting attempts within the Milan Bottoms/Mill Creek Complex study area. All three red-shoulder attempts were successful, one nest contained two fledglings, and each of the other two nests contained one fledgling. This equals the highest number of fledglings that we have recorded in the Milan Bottoms since our investigations in this study area began in 1992. In addition, 1998 marks the first time we have been able to document successful Red-shouldered Hawk nesting on an island in the Mississippi River since our observations began in 1983.

Water levels during February and March were normal or slightly lower than usual. Mississippi River levels were higher during April and May, but duration of high water levels were relatively short. Previous observation along the Mississippi River seem to indicate that Red-shouldered Hawk reproductive success is good when early spring floods are not prolonged (personal observation). We considered the water levels during 1998 to be favorable for Red-shouldered Hawk reproductive success.

We recorded 21 observations on Red-shouldered Hawk activity, and we observed or heard Red-shoulders in all parts of the study. Kelly McKay added several June and July observations that reinforced use of mature forest during normal levels but also showed that during higher water levels, Red-shouldered Hawks commonly moved to edge habitats.

Of the 16 known nesting attempts within the Milan Bottoms study area between 1992 and 1998, nine were considered interior forest locations, and eight were situated within 100 meters of the forest edge.

Although all three nests within the Milan Bottoms were successful in 1998, the overall number young Red-shoulders to reach fledging age was only four. This could be a signal that there is limited space available and three active nests could be considered "crowded." It may well be that this habitat will only support two nesting pairs of Red-shouldered Hawks and three active nests may in fact be the exception.

DESCRIPTION OF RED-SHOULDERED HAWK NESTING SITES - MILAN BOTTOMS 1998

See Map on Page 11

West Powerline - USCOE property just west of the Powerline and just north of Charlie Brandt's property. One young Red-shoulder fledged from this nest in 1998. Nest was approximately 80 meters north and west of the 1997 nesting attempt. Nest tree was a green ash with dbh of 21."

Ridge west of Mill Creek, north and east of Long Pond, approximately 400 yards from the main channel r.m. 477.3. Two young red-shoulders fledged from this nest in 1998. We had confirmed nesting attempts on two occasions during the previous four years, but the 1998 attempt was the first known successful attempt at this site. Nest tree was a Silver Maple with dbh of 22.7 in.

Island along Andalusia Slough - r.m. 475.9, just west (downstream) of the timber harvest on the same island. One young Red-shoulder fledged from this nest in 1998. Nest tree was a Silver Maple with a dbh of 19.8 in. This is the first time that we have been able to document successful nesting of Red-shouldered Hawks on an island in the Mississippi River.

DESCRIPTION OF RED-SHOULDERED HAWK NESTING SITES 1993-1998

Mallard/Gun Pond - USCOE property between the two ponds - site has been referred to as the Klingman nest since John Klingman first located this nest in the spring of 1993. Confirmed successful reproduction in 1997. Not active in 1998. Nest tree is a cottonwood 18" dbh.

Berm along Mill Creek - Red-shoulders used two nesting sites in large cottonwoods along the berm on the West slope of Mill Creek. One was on USCOE property, and the other was on private property just a few yards from USCOE property. Neither of these sites was used in 1998, however, Red-shouldered Hawks commonly use this stand of cottonwoods as perching, loafing and nesting sites.

Long Pond - four different structures near Long Pond were used by Red-shoulders between 1993 and 1998. All of these nesting sites are located on small slightly elevated ridges. However, the overall elevation of this general area is low and the proximity is close to the main channel. None of the previous attempts were successful until 1998.

RESULTS - OTHER RAPTORS

During our investigations in the Milan Bottoms study area in 1998 we also found one Cooper's Hawk, one Barred Owl, and one Red-tailed Hawk nesting attempt, and we suspected at least one other Great-horned Owl and one other Barred Owl nesting attempt. The Cooper's hawk nest was still active in late May, but we were unable to determine the final outcome of this attempt. Cooper's Hawk have been recorded within the Milan Bottoms study area during two of the last four years and each time they exhibited territorial behavior. We have not been able to document a successful Cooper's Hawk nesting attempt.

Red-tailed Hawks nested in the south central portion of the study area just east of Charlie Brandt's property and west of the main Power Line in 1998. This nesting attempt produced two fledglings. Red-tailed Hawks generally start their courtship and nesting cycle two weeks earlier than Red-shouldered Hawks, and the timing and location of the nest in terms of territorial boundaries may have pushed the Red-shouldered Hawks to nest a few yards to the north and west of the Powerline nest location used in 1997.

There has been some evidence from other regions that Red-tails eventually displace Red-shouldered Hawk especially in altered flood-plains. This may or may not be happening in the Milan Bottoms. We feel that the over-all low elevation of the study area probably favors Red-shouldered Hawk, and as long as significant stands of mature timber are present, Red-shoulders will likely continue to inhabit Milan Bottoms..

We did not determine the outcome of the Great-horned and Barred Owl nesting attempts. Similar to the potential conflict between Red-tailed and Red-shouldered Hawks, Great Horned Owls could possibly affect Red-shoulder reproductive success.

RESULTS OF PROTHONOTARY WARBLER AND PILEATED WOODPECKER INVESTIGATIONS

During our investigations for Red-shouldered Hawks within the Milan Bottoms prior to 1998, we collected opportunistic data on active nesting sites, foraging activity, and territorial behavior for both Prothonotary Warblers (*Prothonotaria citrea*) and Pileated Woodpeckers (*Dryocopus pileatus*). During 1998, we collected information on potential nesting sites and foraging activity for both of these species within the Milan Bottoms study area.

Both of these species occupy similar habitat to Red-shouldered Hawks although their specific micro habitat and nest site selection appears to be slightly different. We consider both species to be of potential concern because they require large tracts of interior forest habitat, and that habitat is somewhat limited in some regions of the midwest. Very little is known about their status and reproductive success within these particular habitats in this region.

We observed Pileated Woodpecker territorial drumming, courtship, and nest excavation as early as the first week in March. We observed Pileated Woodpeckers or heard their distinctive drumming during 28 of the 31 days of observations within the Milan Bottoms during 1998. We mapped the location of three Pileated excavations that were potential nest sites (Map 2) and three other excavations that were obviously gouged by Pileateds but were not considered potential active nest excavations. We were unable to confirm the results of any Pileated nesting attempts.

Prothonotary Warblers forage throughout wetland forest habitats, especially where limbs of mature trees hang over water. They feed on insects and during the breeding season they specialize in aquatic insects in areas of slow moving water (Dunn & Garrett 1997).

Between 1994 and 1997, we confirmed Prothonotary Warbler nesting activity in three locations in the Milan Bottoms. One in the section of mature forest just west of Mill Creek (proposed cut #2), one in the cavity of an understory American elm on the island adjacent to Milan Bottoms, and one south of Long Pond along one of the east-west sloughs near the power line (Map 2).

Arrival dates for Prothonotarys appears to be early May. In 1998, we observed Prothonotarys on eleven occasions after May 10 and we confirmed at least one nesting on one of the islands. We observed Prothonotarys collecting and carrying moss in two locations, which would indicate nesting. One in the proposed cut #2, and one just east of the power line and south of the heron rookery.

Between 1992 and 1998, we found active Prothonotary nests at heights of 6.7 ft, 7.5 ft and 9.1 ft. All of the nests we located were in small cavities with an estimated diameter of less than 2 inches. One in an understory American elm, one in a dead silver maple, and one in a green ash.

RECOMMENDATIONS FOR FUTURE RESEARCH AND MONITORING WITHIN THE MILAN BOTTOMS

Our understanding of Red-shouldered Hawk habitat requirements and the interaction of this species with forest habitat and with the yearly flood cycles has increased during the past three years. Although we feel that the investigations and monitoring of Red-shouldered Hawk nesting within the Milan Bottoms should be continued, we feel they should become part of regular monitoring which should be conducted for a variety of species within the Milan Bottoms.

We consider Red-shouldered Hawks to be an indicator of a diverse and mature forest. This species will survive if their habitat does; they are, in fact, just one important element in a myriad of factors within the flood plain forest environment. We feel the overall bird diversity of Milan Bottoms should be documented and we would support any effort that works toward that. We feel that regular avian surveys will likely record continued presence of Red-shouldered Hawks.

In order to maintain some type of continued documentation of Red-shouldered Hawk use of this site, specific observation should be re-established, if and when general avian surveys are discontinued.

Previously, we thought the Milan Bottoms area might be marginal habitat for nesting Red-shoulders due to the lack of topography and suitable dry sites during extended spring flooding. However, during 1997, both Red-shoulder nests we monitored within the Milan Bottoms were successful, and in 1998, all three nesting attempts within the Milan Bottoms were successful. Continued occupation of the study area is probably the best indicator of habitat suitability, and the Milan Bottoms is quite likely the best opportunity for a source population within this district of the Mississippi River.

There has been some evidence from other regions that Red-tailed Hawks eventually displace Red-shouldered Hawks, especially in altered flood-plains. This may or may not be happening in the Milan Bottoms. We feel that the over-all low elevation of the study area probably favors Red-shouldered Hawks, and as long as significant stands of mature timber are present, Red-shoulders will likely continue to inhabit the Milan Bottoms.

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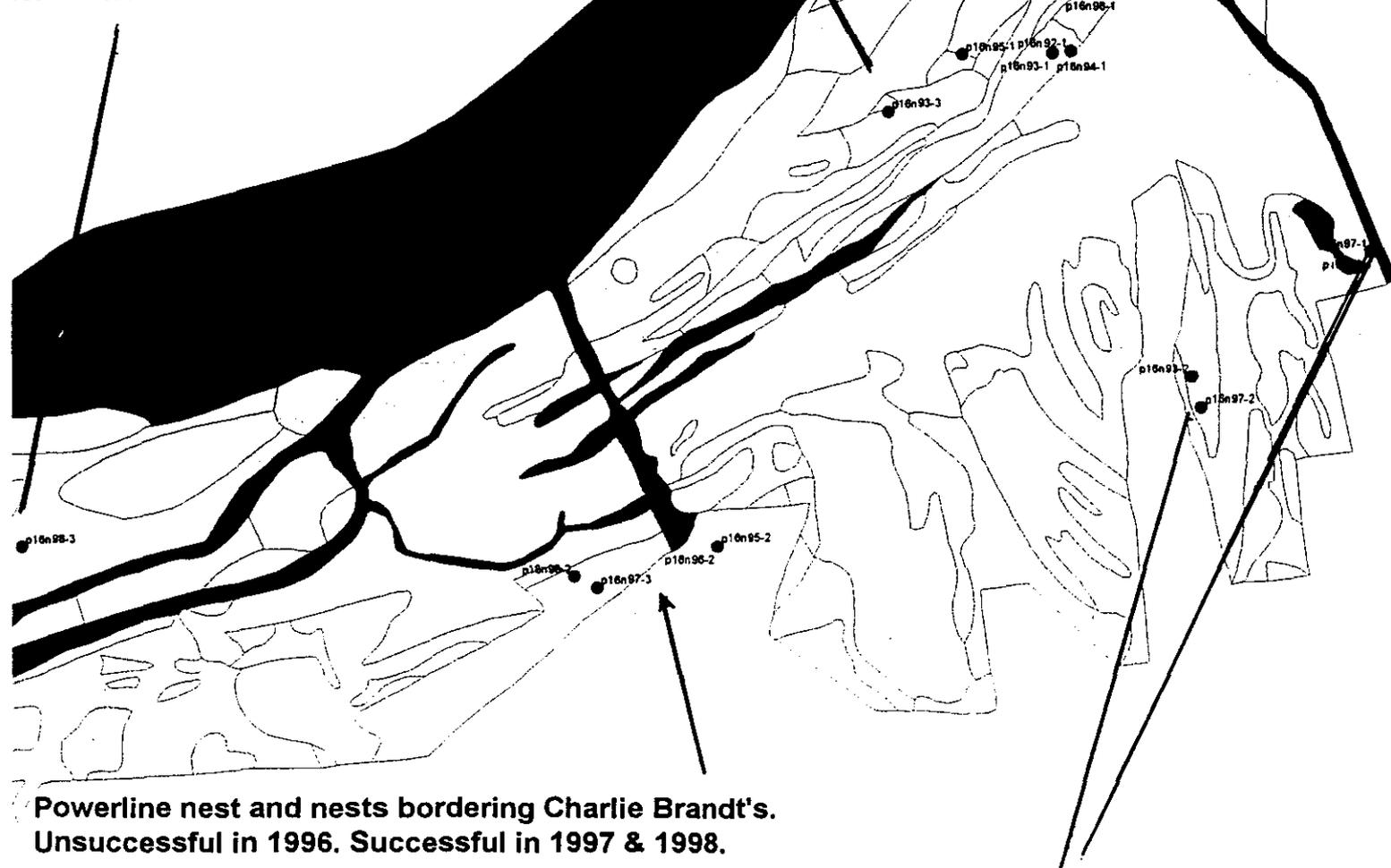
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**MAP OF RED-SHOULDERED HAWK NEST SITE LOCATIONS
WITHIN THE MILAN BOTTOMS 1992-1998.**

(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 2. Pileated Woodpecker (Pileated) and Prothonotary Warbler (Protho) locations within the Milan Bottoms, 1993 and 1998.

X = areas of Pileated Woodpecker cavities.

◆ = Prothonotary Warbler nest sites, or areas where we observed adults carrying nest material.

● = Red-shouldered Hawk nesting sites