

SURVEYS FOR RED-SHOULDERED HAWK NESTING SITES WITHIN POOLS 16-19
OF UPPER MISSISSIPPI RIVER, AND OBSERVATIONS ON RED-SHOULDERED
HAWK NESTING WITHIN THE MILAN BOTTOMS IN ROCK ISLAND COUNTY,
ILLINOIS DURING 1992 AND 1993

Submitted by

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to

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ABSTRACT

During investigations in 1992 & 1993 we confirmed or suspected ten Red-shouldered Hawk (Buteo lineatus) nesting attempts within an 86 river mile stretch of the Mississippi River in Pools 16-19. All of the known nesting attempts were located within three basic areas: the Milan Bottoms near the confluence of Mill Creek, the Lower Lake Odessa unit near confluence of the Iowa River, and the Black Hawk Bottoms near the confluence of the Skunk River. We considered three other areas to be potential RSH breeding habitat.

We found no evidence of RSH nesting in the remaining 39 areas searched which included several forested islands, suitable flood-plain tracts that were not adjacent to forested valley slopes, and suitably structured large flood-plain tracts that were near levees, agricultural fields and human settlements or areas of frequent human disturbance.

We found considerable variation in nesting densities within the McGregor and Wapello Districts of the Mississippi River Valley. We documented or suspected RSH nesting in 14 of the 33 (42.4%) areas searched in Pools 10 & 11 (McGregor District), and in only five of the 45 (13.3%) areas searched in Pools 16-19 (Wapello District).

We found that within the Upper Mississippi River Valley, RSH generally select large tracts of medium to mature even-aged flood-plain forests where the overhead forest canopy is fairly well-developed. All RSH nest sites were closely associated with lentic water, near springs, back-water pools, temporary waterways, or the confluence of two streams. We found that RSH typically nest in areas that, for the most part, have not been logged for 45-55 years.

We estimate that the home range size for a breeding pair is usually around 300 acres, which is often situated within an even larger forest tract. None of the nesting sites within the Wapello District were in forest tracts of less than 700 acres.

RSH were seen or heard in the Milan Bottoms study area during ten of the thirteen searches conducted in 1992 and 1993. We recorded twenty-eight RSH observations and we documented three RSH nesting attempts within the study area. A minimum of four adult and one second year RSH were found within the study area during the spring of 1993.

INTRODUCTION

Red-shouldered Hawks (Buteo lineatus) were previously considered to be a relatively common breeding bird along many of the rivers in southeastern Iowa (Anderson 1907; Bailey 1918; DuMont 1933; Kent & Kent 1975). However, Red-shoulders (RSH) are currently absent from many areas that were previously considered traditional nesting territories (Kent & Kent 1975; Roosa & Stravers 1989; Malmborg & Vanderah 1991; Stravers 1992), and declines in RSH breeding populations have been noted in Iowa and several other midwestern states (Brown 1971; Hands et al. 1989; Roosa & Stravers 1989). This species is currently considered an endangered species in Iowa and Illinois (Roosa 1977; Bowles & Thom 1981).

RSH generally nest in large flood-plain or riparian forest tracts (500 acres or more). Recent studies have found that RSH are somewhat common in portions of Pools 9, 10 & 11 of the Upper Mississippi River. However, only a few nesting territories could be located during extensive surveys conducted along the Mississippi River between the Quad Cities and Burlington during the past decade, even though there are extensive flood-plain tracts within this district (Stravers 1992).

This study was conducted in order to develop our understanding of RSH nesting within this district, and to better understand the disparity in nesting densities between the McGregor and Wapello Districts. Our objectives were:

1. To complete the survey for RSH nesting sites within an 86 mile stretch of the Mississippi River from just above the confluence of the Rock River in Pool 16 to just below the confluence of the Skunk River in Pool 19 (River Miles 394-480)
2. To determine territory size and nest-site fidelity of RSH nesting within the study area.
3. To determine the history of previous forest management within the Milan Bottoms and other RSH nesting sites.
4. To develop management guidelines that will assist federal and state land managers in protecting or enhancing RSH nesting habitat.

METHODS

Primary investigations for RSH nesting activity were conducted within the Wapello District and especially the Milan Bottoms study area between February and June of 1993, but late summer and autumn investigations were also conducted in 1992. Searches for active and previously used raptor nests and RSH activity were conducted both before and after "leaf out" by two investigators (Craighead & Craighead 1956). Conspecific taped calls were played in order to elicit a response and assist in identifying breeding territories (Fuller & Mosher 1987).

We also conducted searches for RSH nesting in other areas within Pools 16-19 of the Mississippi River. We used results from previous studies and we examined aerial photos and topographic maps to identify high potential areas. We also searched various other forested habitats in and adjacent to the Mississippi Valley.

Transect searches of potential nesting sites were usually, or at least ideally, conducted on foot. However, due to the unusually high water levels that persisted throughout the spring of 1993, most investigations had to be conducted with the use of canoe or flat-bottom jon boat.

Active nests were visited whenever possible at various times during the nesting cycle. Distances between active RSH nests were measured, and we also took measurements on tree size, percent of canopy in nest area, and distances to nearest marsh or canopy clearing, nearest stream, and to the main channel of the Mississippi River. We also measured the distance to the nearest agricultural field, logging activity, and other human disturbance. We characterized forest stand type parameters and aquatic habitat types at the RSH nesting areas, and we determined the history of logging by consulting logging records kept by the U.S. Army Corps of Engineers and by interviewing current and former Refuge Managers and district foresters.

RESULTS OF SURVEYS FOR RED-SHOULDERED HAWKS IN THE WAPELLO DISTRICT

During 33 days (128 hours, 213 person hours) of field observations in 1993, and 17 days (96 hours, 110 person hours) in 1992, we confirmed or suspected ten RSH nesting attempts within the 86 river mile stretch of the Mississippi River in Pools 16-19. All of the known nesting attempts were located within three basic areas: Milan Bottoms near the confluence of Mill Creek, Lower Lake Odessa and the confluence of the Iowa River, and Black Hawk Bottoms near the confluence of the Skunk River (Table 1 & Maps 1-3). We considered three other areas to be potential RSH breeding habitat; even though we found no direct evidence of RSH nesting, we considered our searches in these three areas to be incomplete due to high water levels and poor weather conditions during our field investigations (Table 2).

We found no evidence of RSH nesting in the remaining 39 areas searched (Table 3). These "no find" areas included several forested islands, suitable flood-plain tracts that were not adjacent to forested valley slopes, and suitably structured large flood-plain tracts that were near levees, agricultural fields or human settlements or areas of frequent human disturbance.

Of the ten confirmed or suspected RSH territories, three were located on U.S. Fish & Wildlife Service Refuge property, four were on Iowa Department of Natural Resources property, and three were on private property adjacent to a large public tract (Maps-1-3).

RSH REPRODUCTION IN 1993

RSH reproductive success during 1993 in all portions of the Mississippi River was poorest we have found during the last decade. Of the five nesting attempts we monitored in 1993, three were abandoned before completion most likely due to high water levels surrounding the nest tree which measured 7 feet or more on several occasions (Table 1). Four nestlings from one nest (Iowa River/Lake Odessa) all drowned; two of RSH nestlings were old enough to be "branchers", however, the other two were too young to leave the nest under normal circumstances. We were unable to determine the outcome of the final known nesting attempt in 1993 due to extremely high water levels in mid-June.

DESCRIPTION OF RSH NESTING HABITAT

Within the Upper Mississippi River Valley, RSH generally select large tracts of medium to mature flood-plain forests where the overhead forest canopy is fairly well-developed and sub-canopy is relatively open. In areas of significant nesting densities, their home range usually include both flood-plain forest and forested valley slopes. Most of the nesting sites located within the Mississippi River Valley have been situated within 200 meters of a bluff or ridge. All RSH nest sites located within the Mississippi River Valley have been closely associated with lentic water, near springs, back-water pools, temporary waterways, or the confluence of two streams. In contrast, RSH are very seldom found nesting within 300 meters of the main channel of the Mississippi River.

RSH are considered a large tract interior forest species; the home range size for a breeding pair is usually around 300 acres which is often situated within an even larger forest tract (Bednarz 1981; Bloom 1993; Stravers 1993). None of the nesting sites within the Wapello District were in forest tracts of less than 700 acres.

RSH often select forest tracts that, for the most part, have not been logged for 45-55 years. We that found that RSH typically select areas with considerable forest diversity as far as age, composition and structure. RSH typically hunt from a variety of suitable perches which are scattered throughout their home range. Older and more diverse forests usually offer a better variety and higher number of suitable perching sites. Consequently, we believe that forest diversity, the overall long-term stability of large forest tracts, and the presence of a well-developed canopy and open sub-canopy are key elements in continued RSH nesting.

RSH also typically select areas that receive a minimum of human disturbance. Most nesting sites located along the Mississippi River have been in areas that are more than 500 meters from human settlements or areas of frequent human disturbance.

RSH PREY ITEMS IDENTIFIED

The most common prey items identified at RSH nests during the past ten years include frogs, toads, snakes, and crayfish. Other such as small birds, small mammals, fish and insects apparently make up a small but regular part of the RSH diet in this region.

COMPARISON OF RSH DENSITIES IN PORTIONS OF THE MISSISSIPPI RIVER

During surveys for RSH nesting conducted in 1992 & 1993, we have found considerable variation in nesting densities within the McGregor and Wapello Districts of the Mississippi River Valley. We documented or suspected RSH nesting in 14 of the 33 (42.4%) areas searched in Pools 10 & 11 (McGregor District), and in only five of the 45 (13.3%) areas searched in Pools 16-19 (Wapello District).

It appears that a combination of factors may be responsible for relative rarity of RSH in Pools 16-19. (also, see the following section on examples of "no find" areas).

1) Several elaborate levee and drainage systems within the Wapeelo district have altered the flooding cycle and constricted the river flow, thereby reducing wetland and foraging habitat along the river's edge and also effectively separating the forested valley slopes from the large flood-plain tracts.

2) There is a lower percentage of public lands in the Wapello district than in the McGregor district.

3) Timber harvesting and the fragmentation of large forest tracts is much more common in the Wapello District than in the McGregor District.

4) Human population densities, public use rates, and agricultural land within the flood-plain are all higher in Pools 16-19 which increases the chance for disturbance and reduces the opportunities for RSH nesting.

EXAMPLES OF "NO FIND" AREAS

Although there are considerable forest resources within the Wapello study area, we found that very few of the forest tracts contain all of the features required for RSH nesting. Two public tracts, the Big Timber/Kilpeck Landing/Coolegar Slough area (refuge property) just south of Muscatine, and the Big River State Forest just south of Keithsburg, Illinois, can be used to illustrate the circumstances which make RSH relatively rare within this region

The Big Timber area contains suitable forest habitat in terms of size, age and diversity, and it also contains other key elements such as a mosaic of wetlands within the forest. This forest tract appears to be high potential as RSH nesting habitat; however, this area is bordered by the main channel of the Mississippi on one side and by an extensive levee system and agricultural land on the other. We have found that RSH typically do not nest within 500 meters of either the main channel or a levee used for agricultural ground. During several searches in 1992 & 1993, we found no evidence of RSH nesting within this area, nor were RSH reported during surveys for neotropical migrants conducted during the same period.

Due to the construction of numerous levee systems, most flood-plain tracts within the Wapello district are not adjacent to a forested valley slope. However, the forested valley slope is present in the Big River State Forest in Henderson County, Illinois. Unfortunately, it appears that the flood-plain forests within this site have been selectively logged on a regular basis (everything over 16-18" dbh taken). This effectively reduces the overhead canopy and eliminates the open sub-canopy which are key elements in RSH nesting. We found no evidence of RSH activity in this tract, and because of the timber harvest practices, we consider this site to have low potential as RSH habitat.

While the Big Timber and Big River State Forest areas represent only two examples, we found that most other sites we examined within the Wapello District lacked one or two of the critical habitat elements and consequently had limited potential as RSH nesting habitat.

INTERIM MANAGEMENT SUGGESTIONS

The following recommendations may assist wildlife managers to maintain RSH populations within the Mark Twain Refuge, and should also help to manage other species that require large bottomland forest tracts.

1. Known RSH nesting sites should be protected from any major disturbance. Limitations should be enforced on logging, agricultural and human activity, and other disturbances in areas that have been documented as RSH nesting sites.

2. Large forest tracts should not be fragmented, especially where the flood-plain forests are adjacent to forested valley slopes. Fragmentation of such forests creates more edge habitat and favors some of the more common raptor species.

3. In most cases, high grade forestry cuts and selective logging in RSH habitat should be avoided since they contribute to the breakup of the overhead canopy and reduce the openness of the sub-canopy. However, in some cases, selective cuts which help thin out "crowded" younger forests (trees less than 5" dbh) may assist in the eventual development of the overhead canopy and the open sub-canopy which will benefit RSH and several other species.

4. In order to maintain flood-plain forest regeneration in areas where Reed Canary grass has invaded, special forest management techniques may be needed since this species effectively inhibits forest regeneration.

FUTURE RSH RESEARCH RECOMMENDATIONS - WAPELLO DISTRICT

We recommend that the U.S. Fish & Wildlife Service personnel adopt a regular system of monitoring RSH occupation of the known nesting sites on refuge property similar to the Bald Eagle monitoring procedures. The continued occupation of these sites could easily be documented each spring during the courtship or regular nesting period. This would provide a valuable record of RSH territory occupation and could eventually help to answer questions concerning RSH use of forest tracts that become "over mature."

Follow-up investigations of the known RSH nesting sites in 1994 would also help to document the RSH response to the record flooding that occurred along the Mississippi River Valley in 1993.

RESULTS OF INVESTIGATIONS WITHIN THE MILAN BOTTOMS

Red-shouldered Hawks (RSH) were seen or heard in the Milan Bottoms study area during ten of the thirteen searches conducted in 1992 and 1993 (Table 1). We recorded twenty-eight RSH observations and we documented three RSH nesting attempts within the study area (Figure 1). A minimum of four adult and one second year RSH were found within the study area during the spring of 1992.

One RSH nest, located 65 meters south of Long Pond (midway between cuts #1 and #3) was constructed, defended, and temporarily used by a pair of adult RSH, but they subsequently abandoned it sometime between April 18 and April 28, 1993. The abandonment of this nesting site could have been related to extremely high water, or the extended period of flooding, or the extended periods of cool, wet weather that occurred during the incubation period (see discussion of weather conditions and water levels). Although this nesting attempt did not produce young during 1993, we believe that continued RSH nesting is probable at this site.

Another nesting attempt was confirmed on private property just north of another pond approximately 560 meters south-southeast of the confluence of Mill Creek and Kickapoo Slough, and 1240 meters east of the power line (Figure 1). The actual nest was not discovered until April 28. Adult RSH were still incubating on May 17, however, the final outcome of this nesting attempt is not known.

The timing for this nesting attempt was at least 18-20 days later than the typical timing for RSH nesting within this region. We do not know whether this was a second nesting attempt by the RSH that first used the Long Pond nest, or a separate nesting attempt by the other pair of RSH.

Another RSH nest adjacent to cut #2 was monitored during the study period. The nest was built, defended, and tended on an apparently regular basis between early April and mid-May. RSH were observed at this site on four occasions; RSH were also observed in the same tree and became vocal and obviously upset when the nest area was approached by investigators. However, after May 11, no RSH territorial activity was observed in this area.

RECOMMENDATIONS FOR FOREST MANAGEMENT WITHIN THE MILAN BOTTOMS

Although in some respects the proposed timber cuts may provide some forest regeneration and may benefit the long-term health of the forest tracts within Milan Bottoms, we feel that these cuts may cause the RSH to abandon this site as a nesting area. Consequently, we feel these cuts should not be conducted for the following reasons.

1. Red-shouldered Hawks are extremely rare within this district of the Mississippi River (Only three known nesting locations within Pools 16-19). Consequently, the known nesting sites should receive maximum protection.
2. Most research has shown that RSH will often abandon nesting sites following logging activity. We feel that the fragmentation of the Milan Bottoms tract will not enhance conditions for RSH but will provide more edge habitat which will benefit the more common raptors such as Red-tailed Hawks and Great-horned Owls, especially if dry conditions should prevail following the timber harvest.
3. In most cases, sites that have had a history of continued RSH nesting are typically areas where there has been little, and in most cases, no forest management practiced.
4. Of equal importance, these cuts may be even more detrimental to other old-growth, large tract species such as Cerulean Warblers, Prothonotary Warblers, Parula Warblers, Ovenbirds, Pileated Woodpeckers, Black-crowned and Yellow-crowned Night Herons and Bald Eagles.
5. Although RSH are relatively rare in this region, there is a relative abundance of medium to mature-aged forest within pools 16-19. We feel there are numerous forested areas where timber harvests would not conflict with RSH nesting.
6. The withdrawal of the proposed timber sale in the Milan Bottoms would clearly demonstrate a genuine concern for rare and endangered resources within the Mississippi River Valley by the U.S.C.O.E. Natural Resources Division. Such a consideration could also provide an excellent opportunity for some positive public relations.

LITERATURE REVIEWED

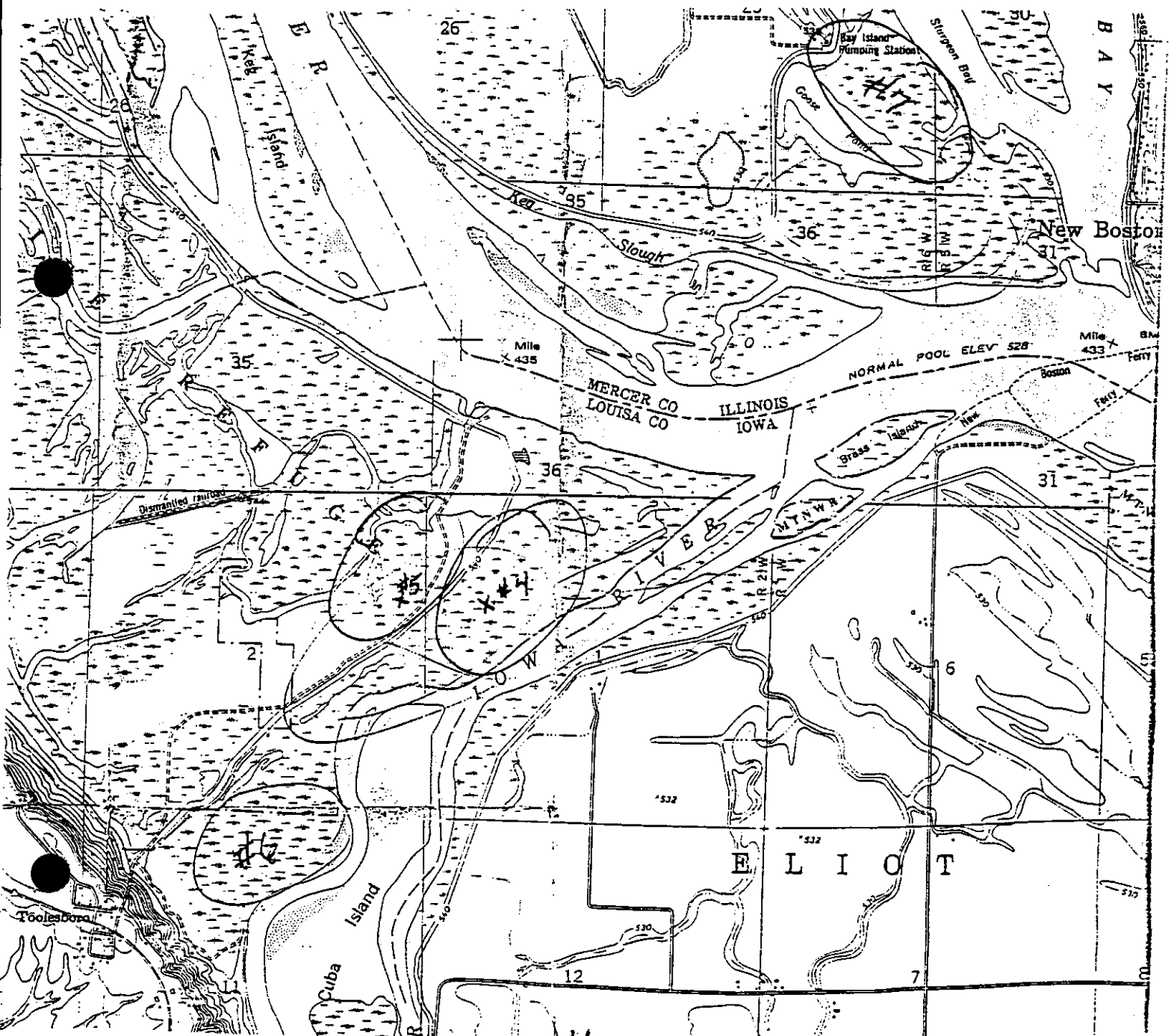
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MAP 2, SITES 4, 5, 6 & 7

Location of the Red-shouldered Hawk nests in the Lake Odessa area near the confluence of the Iowa River and Mississippi.

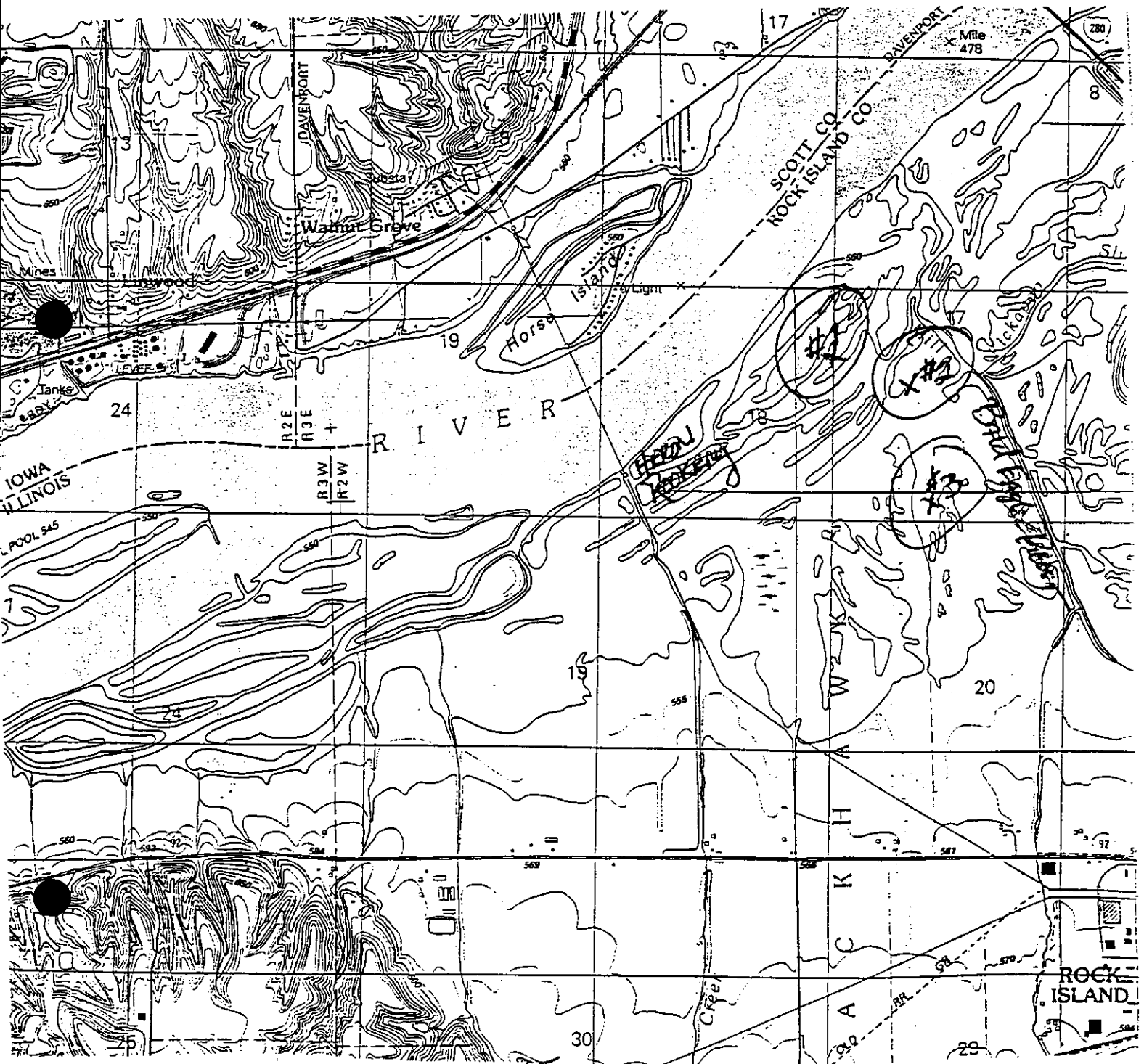
- #4 - 250 meters east of the access road: Nest was used in 1992, but not in 1993.
- #5 - 45 meters west of the access road: Nest was active in 1993 - four nestling Red-shoulders reached fledging age, but all four were found drowned near the nest on May 20.
- #6 - Iowa River flood-plain just below Toolsboro ridge: RSH nesting has not been confirmed in this area; however, most of our searches were conducted during unfavorable weather conditions, and we consider this area to be a potential RSH nesting site.
- #7 - Sturgeon Bay/Keg Slough: Although we found no direct evidence of RSH nesting, RSH were observed here during the winter of 1991/92, and we consider this to be potential nesting habitat.



MAP 1, SITES 1, 2 & 3.

Location of the Red-shouldered Hawk nests along Mill Creek and Long Pond within the Milan Bottoms, Rock Island County, Illinois. Map also shows location of the Heron Rookery and the Bald Eagle night roosting site.

- #1 - just south of Long Pond: Nest was built and defended but subsequently abandoned (probably due to extremely high water).
- #2 - 200 meters west of the confluence of Kickapoo Slough and Mill Creek: Nest was built or refurbished and defended (territorial activity observed), but incubation was never confirmed and the nest was eventually abandoned.
- #3 - 50 meters east of pond on private property: RSH nesting activity observed in late April and incubating in mid-May. Final outcome was not determined due to high water.



MAP 3, SITES 8, 9 & 10

Location of the Red-shouldered Hawk nesting sites in the Black Hawk Bottoms near the confluence of the Skunk & Mississippi Rivers in Des Moines County, Iowa.

- #8 - Patterson Lake: active nest located approx 150 meters east of Patterson Lake; territorial activity and incubation observed in March and April of 1993; however, nest was later abandon.
- #9 - Roscom Pond/Sullivan Slough: previously active RSH nest site; however, the area has recently been logged, and no evidence of RSH nesting was found in 1993.
- #10 Long Pond/Skunk River: previously active RSH nest site; however, area was recently logged; no evidence of RSH nesting found in 1993.

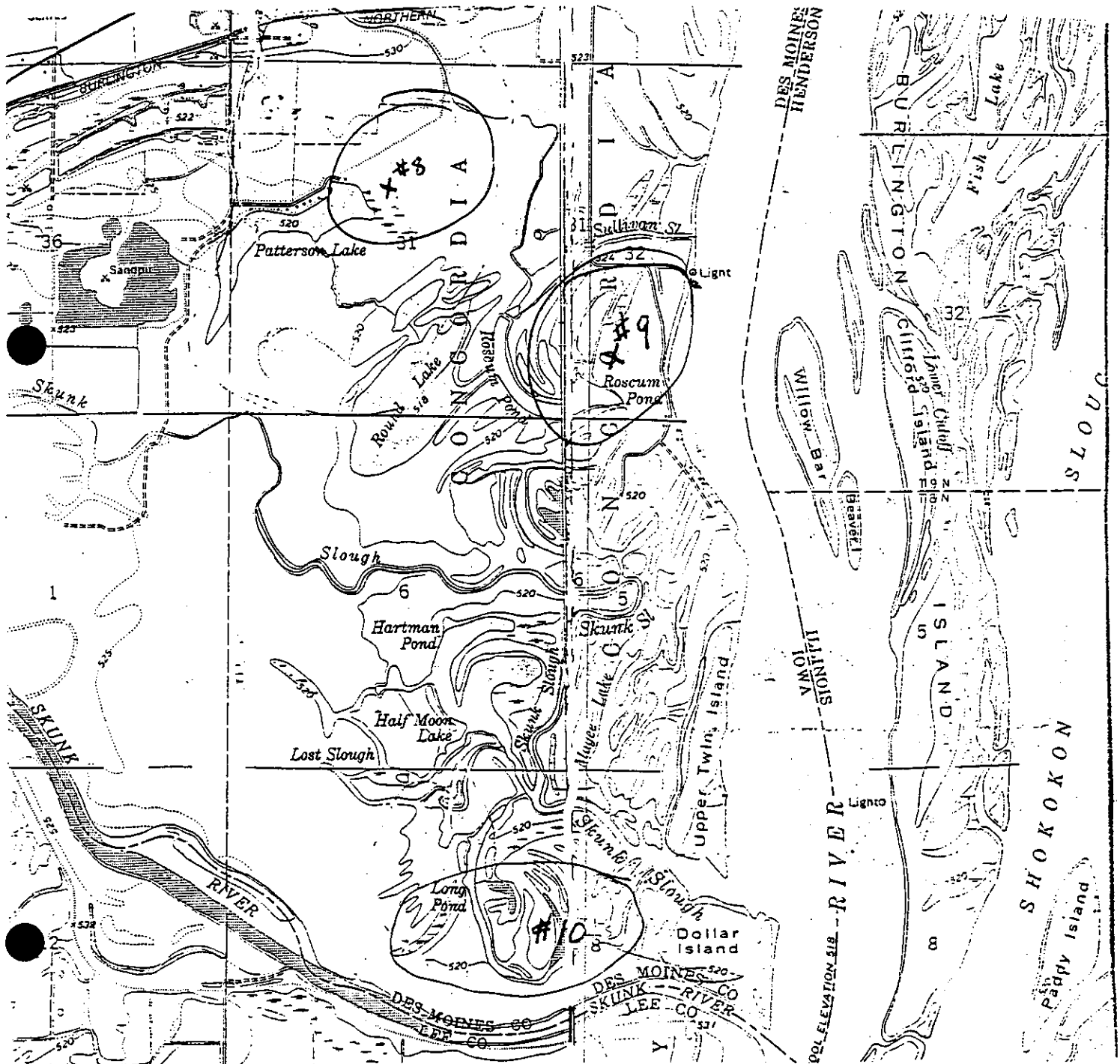


TABLE 1. AREAS OF CONFIRMED OR SUSPECTED RED-SHOULDERED HAWK NESTING
 Active nests were located or calling adults were present on more than one occasion during the breeding season.

MAP/SITE AREA / RESULTS

- 1 / 1 Milan Bottoms/Long Pond - .3 mile south of r.m. 477.1, 65 meters south of Long Pond (USF&WS property). In 1992, adults and young observed - nesting suspected. In 1993, nest building and RSH territorial activity observed in March & April of 1993; nest was later abandoned, probably to extremely high water (nest tree was in more than 7 feet of water on several occasions.
- 1 / 2 Milan Bottoms/Mill Creek - 200 meters west of the confluence of Kickapoo Slough and Mill Creek. Nest was built or refurbished and defended (territorial activity observed), but incubation was never confirmed and the nest was eventually abandoned.
- 1 / 3 Milan Bottoms/Mill Creek - .86 miles south of r.m. 477.2, (Private Property). In 1992, adults and young were observed in June and November - nesting suspected. In 1993, territorial activity observed on two occasions in April; nest discovered on April 28; RSH still incubating on May 17 - outcome unknown.
- 2 / 5 Iowa River/Lake Odessa - .7 mile SSW of r.m. 435 (USF&WS property). In 1992, nesting confirmed on the south side of dike. In 1993, the nest was located on the north side of the dike; four nestling RSH reached fledging age but were found drowned on May 20; nest tree was in 5-7 feet of water.
- 3 / 8 Black Hawk Bottoms/Patterson Lake - 1.2 mile west of r.m. 398.1 In 1992, nesting was confirmed in other portions of the Black Hawk Bottoms tract, but not in this location. In 1993, RSH territorial activity observed on March 25; active nest located, RSH incubating on April 17; nest was abandoned/unsuccessful by May 20. None of the other previously reported nesting sites within the Black Hawk Bottoms were active in 1993.

TABLE 2. ALTHOUGH WE DID NOT FIND RSH AT THE FOLLOWING LOCATIONS,
WE CONSIDER THESE SITES TO BE POTENTIAL RSH NESTING HABITAT.

MAP/SITE AREA / STATE & RIVER MILE

- 2 / 6 Iowa River - NE 1/4 of sec 11, T-74N, R-2W, Louisa County,
.4 mile east of Toolsboro, 2.2 miles from the confluence of
Mississippi. Although we have not been able confirm RSH nesting
at this location, we suspect that RSH nest here during when
water levels are normal.
- 2 / 7 Sturgeon Bay - .6 mile north of r.m. 433.5 (USF&WS property).
Canopied forest which is large enough with suitable wetlands.
Adjacent levee and nearby ag land may prohibit RSH nest; however,
RSH have been reported here during late winter and we feel this
site should be considered potential RSH nesting habitat.
- - Pope Creek - .3 mile east of r.m. 427.9, just south of the
Keithsburg unit. Canopied forest and suitable wetlands.
Our investigations were limited by high water, but we consider
this to be potential RSH nesting site.

TABLE 3. AREAS WHERE WE FOUND NO EVIDENCE OF RED-SHOULDERED HAWK NESTING

* Indicates searches conducted in both 1992 & 1993.

Pool 16

Credit Island - .3 miles north of r.m. 478.7-479.3
* Andalusia Island - south of r.m. 470-471
Montpelier - .1 mile north of r.m. 468-469
* Loud Thunder Forest Preserve - 1.2 miles south of r.m. 466-467
* Andalusia Slough - 1.2 miles south of r.m. 463-465
Pine Creek - .15 mile north of r.m. 465-466
Drury Slough - .5 mile south of r.m. 460-461

Pool 17

Near the highway 92 Bridge - .2 mile SSE of r.m. 455.6-456.3
Blanchard Chute - .3 mile east of r.m. 449-450
Crosses Corner - .8 mile east of r.m. 446-447
* Barkis Island Chute - .8 mile east of r.m. 444.8-446
* Kilpeck/Big Timber - .5 mile west of r.m. 443-446
* Bogus/Hail Chute - .5 mile east of r.m. 439-441
* Lake Odessa Unit - 1.3 miles west of r.m. 437-438

Pool 18

Otter Island - .2 mile west of r.m. 437
* Lake Odessa unit, south end - .6 mile west of 435.5-437
K Island & Island east - .2 mile west of r.m. 436
* Iowa River - above Toolsboro
* Iowa River - Cuba Island
Brass Island/Keg Slough - .2 mile south of r.m. 433.5-434.2
Corsepius Island - .2 mile west of r.m. 431-432
* Confluence of Edwards & Mississippi R. - .3 mile east of r.m. 431.3
North of Blackhawk Island - .3 mile west of r.m. 429-431
Mapes Chute - .6 mile east of r.m. 426-427
Louisa-Des Moines County Line - .3 mile west of r.m. 425-426
Willow Bar Island - .3 mile east of r.m. 425-426
Huron Chute - 1.4 mile west of r.m. 424-425
N.E. section of Huron Island - .5 mile west of r.m. 424-425
East side of Cody Chute - .5 mile west of r.m. 422-423

Pool 19

Spring Creek/Mercer Slough - .7 mile NW of 409.5-410
Henderson Creek - .5 mile NE of r.m. 410-411
Willow Bar/Crystal Lake - .3 mile NE of r.m. 406.5-407
O'Connell Slough - 1.4 mile NW of of r.m. 405-406
Millman Lake - 1.8 mile east of r.m. 399
Clear Lake - 1.5 mile east of r.m. 398
Haley Creek - 1 mile east of r.m. 397
* Skunk Slough - .8 mile west of r.m. 397
* Half Moon Lake/Slough - .6 mile west of r.m. 396.2
* Skunk River - Hwy 61 bridge to the Mississippi

TABLE 4. SUMMARY OF RED-SHOULDERED HAWK ACTIVITY OBSERVED IN THE MILAN BOTTOMS, ROCK ISLAND COUNTY, ILLINOIS, DURING 1992 & 1993.

DATE	RESULTS
04/24/92	Site first visited (unfavorable weather conditions). Although no RSH were observed the site was rated as having high potential for RSH nesting.
06/03/92	RSH reported near Mill Creek by John Klingman of USCOE.
06/16/92	Adult, 2nd year, and fledgling RSH observed in Milan Bottoms area in the vicinity of cuts #1 and #3.
fall/92	Visited the site with USCOE, USF&WS and IDOC personnel; RSH present near cuts #1 & #3.
02/03/93	Several potential or previously used RSH nest structures were located within the study area. Water/ice levels were moderate.
03/05/93	RSH observed in courtship and territorial flight near the power line and near cut #3. Also, Red-tailed Hawk nest construction observed along Kickapoo Slu. Water levels were high enough to prevent access to some areas.
03/17/93	Study area visited late in the afternoon. No RSH observed or heard; however, temperatures were below normal and wind conditions made RSH calling unlikely. Water levels were moderate and did not affect our investigations.
03/24/93	Visited the site with Bob Clevestine and Terri Jacobson of the U.S. Fish & Wildlife Service, Rock Island. Searched the area near proposed cuts #1 and #3; RSH territorial activity observed near Long Pond in the a.m. and again in early p.m. Water levels were rising; they influenced but did not limit our investigations.

TABLE 4 (continued).

- 04/02/93 Visited the site with John Duvejunck, USF&WS, Rock Island. Searched a small portion of proposed cut #3 and adjacent sloughs. No RSH observed or heard; however, high water levels limited our search to the backwater sloughs.
- 04/04/93 RSH territorial activity observed near the Long Pond nest. Also, 2nd year and adult RSH observed near cut #2. Water levels were high enough to enable us to float anywhere in the study area.
- 04/18/93 RSH present near the Long Pond nest; territorial activity observed near a newly constructed nest, 120 meters west of Mill Creek adjacent to cut #2.
- 04/28/93 Visited the site with Gary Swenson and John Klingman of U.S. Army C.O.E. Natural Resources Division. No RSH activity observed near Long Pond nest. Newly constructed RSH nest located on private property south of proposed cuts. RSH also heard near cut #2. Water levels were still high - 5 to 7 ft deep in most areas.
- 05/11/93 RSH observed near cut #2; however, the nest which was previously thought to be active appeared abandoned or at least inactive. Water levels still extremely high.
- 05/17/93 Long Pond nest abandon/inactive. RSH incubating at the new nest on private property. Water levels still high enough to float anywhere in the study area.
- 06/29/93 Field investigations in Milan Bottoms canceled due to inclement weather and severe flooding (record levels).
06/30/93

