REPORT ON RED-SHOULDERED HAWK INVENTORIES – MILAN BOTTOMS AND POOLS 12 & 13 OF THE UPPER MISSISSIPPI RIVER – YEAR 2004

Submitted to:

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

Illinois Department of Natural Resources,
Wildlife Preservation Fund

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EXECUTIVE SUMMARY

Between March and July of 2004, searches were conducted on eight days for evidence of Red-shouldered Hawks nesting along the Mississippi River in the Milan Bottoms study area, and on fifteen days in Pools 12 & 13. Although Red-shouldered Hawks were sighted within the Milan Bottoms study area, we were unable to confirm the location of any active nest in the Milan Bottoms.

We confirmed Red-shouldered Hawk nesting in six areas in Pools 12 & 13, and we suspect nesting in six additional areas. We found no evidence of Red-shouldered Hawk nesting in six areas and we were unable to search four additional areas that may suitable as Red-shouldered Hawk nesting habitat. We determined the outcome of four of the six confirmed nesting attempts. Of these, three were successful (75%) and produced 7 nestlings (2.3 per overall attempt, and 1.75 per successful nesting attempt).

We feel that the habitat along the Illinois side of the Mississippi River in Pool 12 represents some of the highest density of nesting Red-shouldered Hawks on the Upper Mississippi River. We confirmed four nesting attempts and we suspect nesting in at least three other areas within a stretch of thirteen river miles from 575 to 562.

Red-shouldered Hawks demonstrated a high nest-fidelity since several of the active territories we located in 2004 were in areas that we had previously found them in 1992-1994.

RESEARCH OBJECTIVES

1. Search previously active Red-shouldered Hawk nesting sites and potentially new nesting sites within the Milan Bottoms/Mill Creek and within Pools 12 & 13 of the Upper Mississippi River.

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 2004 within the Milan Bottoms with those found in other areas of the Mississippi River, and compare Red-shouldered Hawk reproductive success in 2004 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.

2. Inventories of Red-shouldered Hawk nesting sites within Pools 12 & 13 of the Upper Mississippi River conducted in 1992-1994 indicated a significant density of nesting sites within some portions of these two pools. Since then, we have not been able to follow up with these surveys to determine re-occupation rates.

3. Our understanding of habitat requirements for Red-shouldered Hawks has increased and changed 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). 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).

- MILAN BOTTOMS

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. Although the elevation of the study area is low enough so that much of it is under water during typical spring flooding, there are several slightly elevated ridges within the study area that remain exposed during most flooding. There have been some selective timber harvests within the study area at various times in the past, however, 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.

We have monitored the Red-shouldered Hawk activity and reproductive success within the Milan Bottoms study area between 1993 and 2004 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.

- POOLS 12 & 13

Inventories for Red-shouldered Hawks were conducted in the early 90's and several active territories were located. Although some of these territories have been occasionally visited during the past ten years, there has been no concerted effort to document the density of nesting Red-shouldered Hawks or the re-occupation of the known nesting sites in recent years.

METHODS

Methodology for Red-shouldered Hawk inventories generally followed the protocol used in previous years and 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. 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 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. 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 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 2004, searches were conducted on eight days for evidence of Red-shouldered Hawks nesting along the Mississippi River in the Milan Bottoms study area, and on fifteen days in Pools 12 & 13. Although Red-shouldered Hawks were sighted within the Milan Bottoms study area, we were unable to confirm the location of any active nest in the Milan Bottoms.

We confirmed Red-shouldered Hawk nesting in six areas in Pools 12 & 13 (Table 1), and we suspected, but were unable to confirm, nesting in six additional areas (Table 2). We found no evidence of Red-shouldered Hawk nesting in six areas; this included at least one area that had formerly been confirmed as active nesting sites (Table 3). We were unable to search four additional areas that may be suitable as Red-shouldered Hawk nesting habitat (Table 4). We determined the outcome of four of the six confirmed nesting attempts. Of these, three were successful (75%) and produced 7 nestlings (2.3 per overall attempt, and 1.75 per successful nesting attempt).

RED-SHOULDERED HAWK NESTING SITES – POOLS 12 & 13 - 2004

Lower Sinsinawa River – 15T 705448 UTM 4698509
Located on the south bank near the confluence of Sinsinawa River and Deadman's Slough. This nesting attempt was successful with at least two nestlings reaching fledging age (one in flight). This nest site was active in 1994 and has been active during the years we were able to check it since then.

Smallpox Creek – 15T 712203 UTM 4691832
Located on the north bank of Smallpox Creek near the confluence with Stone Slough. This nesting attempt was successful with four nestlings reaching fledging age (two observed in short flights). This location has also been active in recent years, and could be on private property.

Lainsville Slough – 15T 728295 UTM 4669902
Located west side of slough just below Brown's Lake. At least one nestlings reached fledging age (possibly two, but unable to confirm that). We have records of this site being active as far back as the mid 1980's.

Menominee Slough – 15T 703622 UTM 4699585
Located along Menominee Slough just below the confluence of the Little Menominee River. This nesting attempt failed. We are unsure of the cause of the failure but it may have been weather related.

Menominee River Confluence – 15T 699898 UTM 4702162
Located just downstream from the confluence of the Menominee River. This territory was confirmed active, but we were unable to confirm the outcome of the nesting attempt.

Pleasant Creek/Flat Lake – located near the USF&WS parking lot. RSH reported by Debbie Dee. We did not confirm the outcome.

LIST OF RED-SHOULDERED HAWK NESTING SITES - MILAN BOTTOMS

Confluence of Mill and Warren Creek - 15T 0697836 UTM 4591536
We located active nests within this general area each year from 1999-2003. Red-shouldered Hawk activity was observed in this particular area during 2004, but no active nest was located.

Kickapoo Slough - 15T 0698367 UTM 4592094
This was a new nest site location in 2003, although this nesting attempt failed in 2003. No RSH nesting activity was observed in this specific area in 2004.

Powerline - 15T 0695827 UTM 4591245
We located active nests within this general area each year between 1996 and 2002. No RSH activity was observed in this general area during 2004. 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 North -
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, our searches in 2003 and 2004 and in previous years have been incomplete (In some respects, due to the fact that this portion of the study area is in private property.) RSH may be nesting in this portion of the study area.

SUMMARY OF RSH REPRODUCTIVE SUCCESS

- MILAN BOTTOMS 1992-2004

The number of nesting attempts we confirmed in the Milan Bottoms study area varied from year to year between 1992 and 2004. We confirmed three attempts in 1998, 1999 and 2000, and two attempts in 2001, 2002, and 2003, and no attempts in 2004. 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). The success rate within Milan Bottoms 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 during this time period varied from year to year, with a high of 88%, to a low of 33%, which occurred during the flood years of 1993 and 2001.

- POOLS 12 & 13 - 2004

We determined the outcome of four nesting attempts in 2004 in Pools 12 & 13. Three were successful (75%) and produced 7 nestlings (2.3 per overall attempt, and 1.75 per successful nesting attempt). Although our sample size was rather limited, this success rate nevertheless is higher than the success rates we found in the Milan Bottoms and higher than the success rates found in earlier years in other sections of the Mississippi River.

It may be significant that Red-shouldered Hawks in Pools 12 & 13 demonstrated a high nest-fidelity since most of the active nesting sites we located in 2004 were in areas that we had previously found them in 1992-1994.

DISCUSSION - MILAN BOTTOMS

Our effort and coverage of the Milan Bottoms study area during 2004 was similar to previous years. However, we were unable to confirm the location of any of active Red-shouldered Hawk nests.

Between 1996 and 2002, RSH within Milan Bottoms typically selected and then re-used nest site locations within a few specific nesting areas (see map of nest site locations). RSH 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. In 2003 and especially in 2004 RSH shifted and apparently used new nest site locations that we have been unable to locate. It is possible that RSH in Milan Bottoms are responding to our research effort, and purposely searching for more secretive locations in order to avoid detection (In reality, this is only speculation).

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).

DISCUSSION – POOLS 12 & 13

We feel that the habitat along the Illinois side of the Mississippi River in Pool 12 represents a string of suitable habitat which we think may be some of the highest density of nesting Red-shouldered Hawks on the Upper Mississippi River. We confirmed four nesting attempts and we suspect nesting in at least three other areas within a stretch of thirteen river miles from 575 to 562. RSH nesting densities in the middle and upper portions of Pool 13 may be similar, (Our search effort in 2004 was more complete in Pool 12 than in Pool 13, since Savanna Army depot, the Green Island complex, and several other suitable habitats in Pool 13 were not searched).

RSH nest-fidelity was again significant since several of the active nesting sites we located in 2004 were in areas that we had previously found them in 1992-1994.

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 plan to summarize our findings and publish a summary report.

Due too the poor reproductive success during the past three years, we had hoped that 2004 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 2004, 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 pair of Red-shouldered Hawks.

It is possible that Red-shouldered Hawks are responding to our research effort and making a specific attempt avoid detection. If so, 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 a 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. RSH nesting densities appear to be high in some portions of Pools 10-13. We also feel there may be some other partnership potentials at other locations along the river, and therefore suggest that RSH inventories with USCOE be continued in these areas in whatever way is feasible.

ACKNOWLEDGEMENTS

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- National Audubon Society's Upper Mississippi River Campaign

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- Mike Smith and Julie Miller from Dubuque.

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TABLE 1 - ACTIVE RSH TERRITORIES								
SITE	POOL	RIVER MILE	STATE	EASTING	NORTHING	# SEARCHES	STATUS/OUTCOME	RESULTS 2004
Sinsinawa confluence	12	569	IL	705448	4698509	4	active/successful	adult at or on nest 3/29 & 4/14
								two nestlings reached fledging age 5/29 & 6/01
Smallpox Creek	12	563	IL	712203	4691832	2	active/successful	adult on nest and male calling 4/14
								4 nestlings (2 branching) 6/01
Lainsville Slough	13	544.2	IA	728295	4669902	2	active/successful	RSH reported by Teresa Blackburn
								at least one fledling observed on 6/02
Menominee S/Little Mn R.	12	570.4	IL	703622	4699585	4	active/failed	adult at nest 3/29 & 4/09
								no adults or young observed after 5/29
Menominee River confluence	12	573.7	IL	699898	4702162	3	active/uncertain	RSH calling 4/09
								territory active but outcome not known
Pleasant Creek/Flat Lake	12	550.6	IA				active/uncertain	calling adult reported by Deb Dee USF&WS

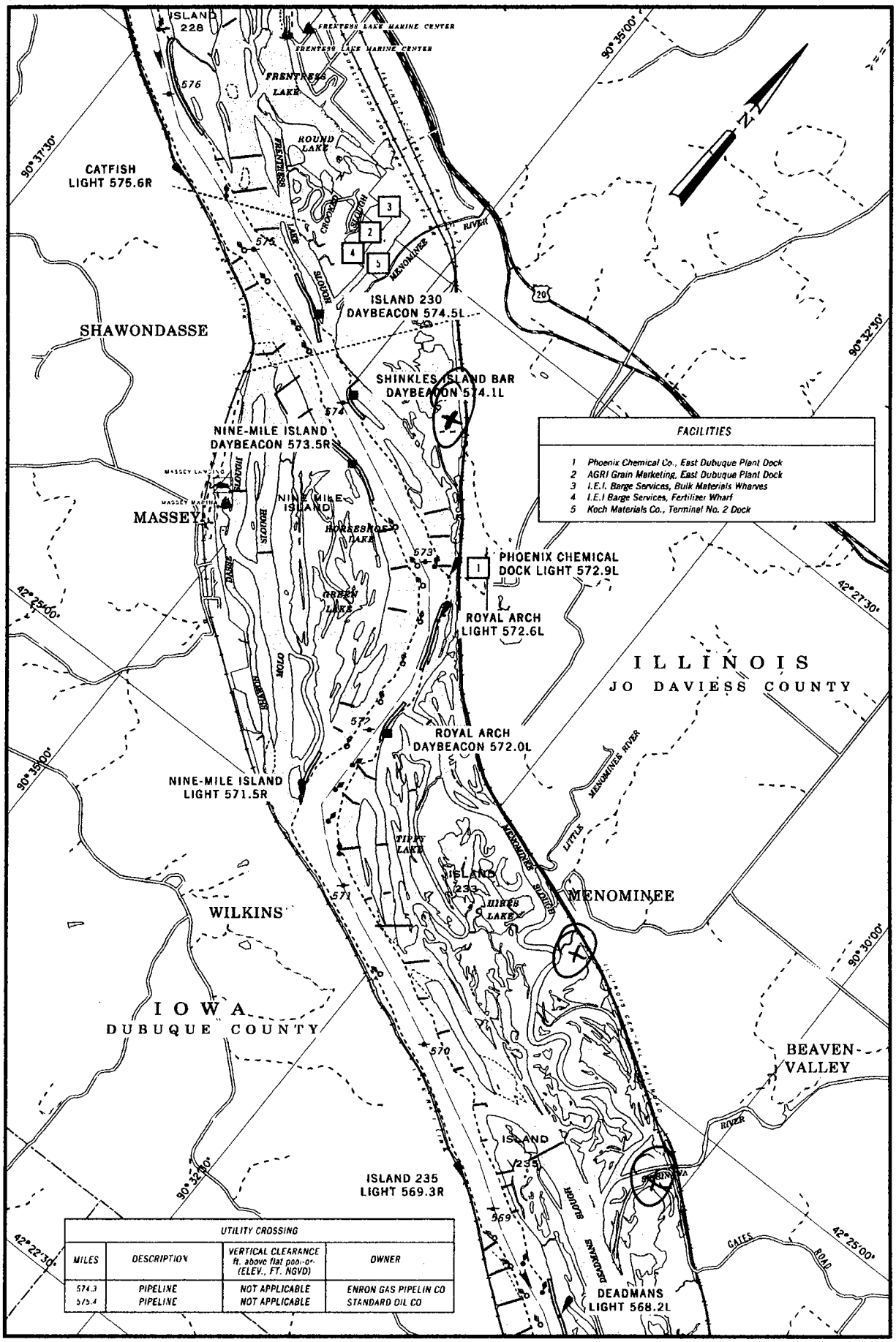
TABLE 2 - SUSPECTED RSH TERRITORIES								
SITE	POOL	RIVER MILE	STATE	EASTING	NORTHING	# SEARCHES	STATUS/OUTCOME	RESULTS 2004
Keho Slough	12	567-568.5	IL			2	uncertain	potential, but unconfirmed nesting
Galena confluence/Menominee S.	12	564.5-565.5	IL	710128	4695030	2		private property
Esmay Slough/Beaver Creek	13	539-540	IA	732207	4666642	1	uncertain	uncertain in 2004 - territory active in 2000
Galena River - upriver	12		IL	711537	4696067	1	incomplete search	Active in recent years - private property
Savanna Army Depot/Lost Mound	12	556.6	IL				not searched	Active early 90's - no recent checks
Green Island	13		IA				not searched 2004	RSH reported by various birders in recent years

TABLE 3 - INACTIVE RSH TERRITORIES

SITE	POOL	RIVER MILE	STATE	EASTING	NORTHING	# SEARCHES	STATUS/OUTCOME	RESULTS 2004
East Dubuque/Midtown	12	575-579	IL			3	probably not	juvenile heard October 2002
								no signs of RSH in spring of 2004
Frentress Slough/Switzer Laake	12	577.5	IL			2	probably not	
Shawandosse Creek	12	575	IA			2	inactive	RT - no RSH - tributary
Upper Menominee/Stone Lake	12	572.5	IL			2	inactive	no RSH observed
Shawondasse Slough/Massey.	12	572-574	IA			3	inactive	Active early 90-'s - recently inactive
Pleasant Creek/Bowman Slough	13	550-553	IA			2	no evidence	no RSH observed

TABLE 4 - POTENTIAL RSH TERRITORIES THAT WERE NOT SEARCHED

SITE	POOL	RIVER MILE	STATE	EASTING	NORTHING	# SEARCHES	STATUS/OUTCOME	RESULTS 2004
Apple River confluence	13	544-545	IL				not searched	?
Marcus Bottoms	13	542-543	IL				not searched	?
Plum River Confluence	13	536-537	IL				not searched	?
Elk River Confluence	13	528	IA				not searched	?



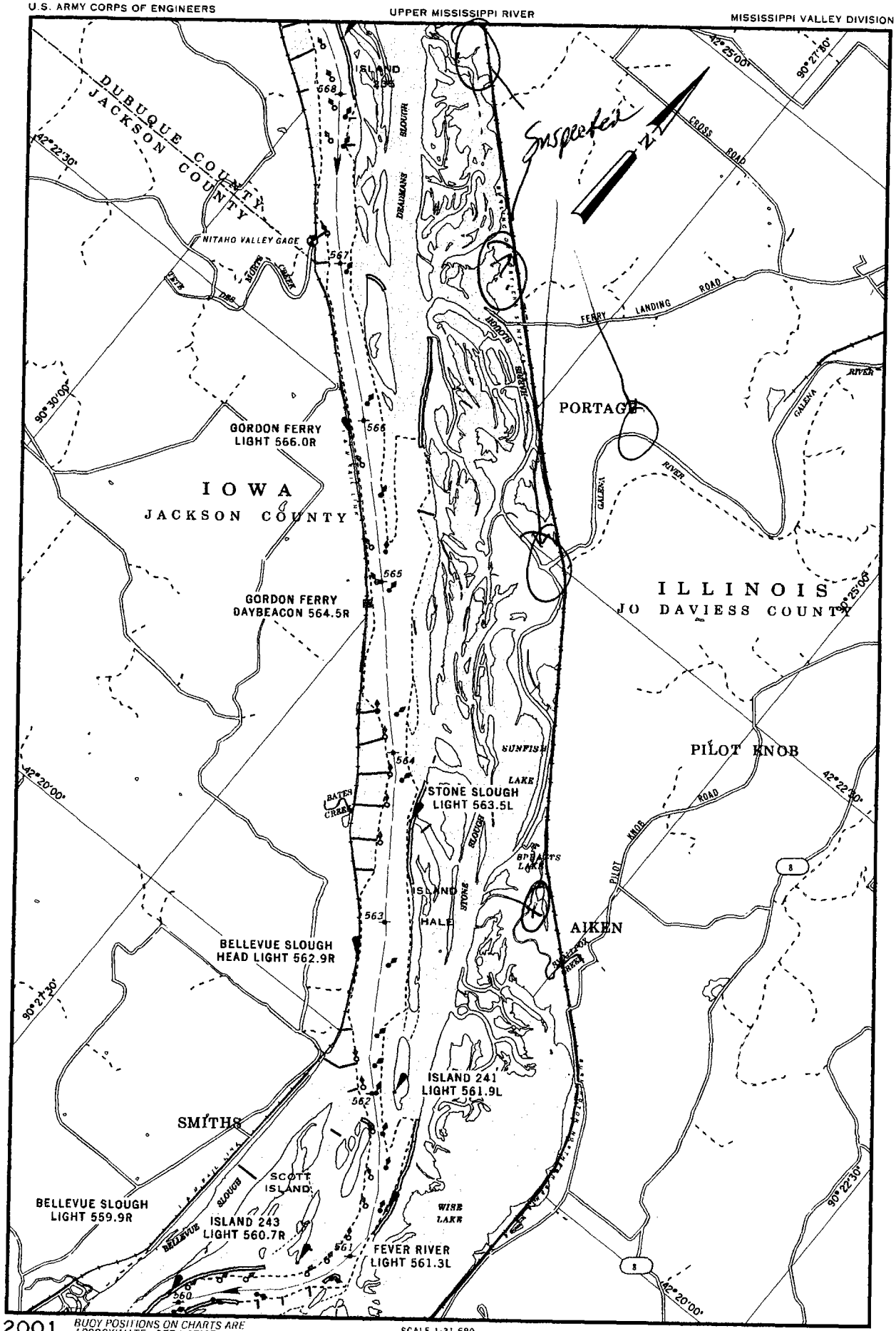
2001 BUOY POSITIONS ON CHARTS ARE APPROXIMATE, SEE NOTICE ON LEGEND NO. 1

SCALE 1:31,680
1 INCH = 1/2 MILE

1 1/2 0 1 MILE

1 .5 0 1 KILOMETERS

MAP NO. 45
RIVER MILE 569 TO 578



2001 BUOY POSITIONS ON CHARTS ARE APPROXIMATE. SEE NOTICE ON LEGEND NO. 1

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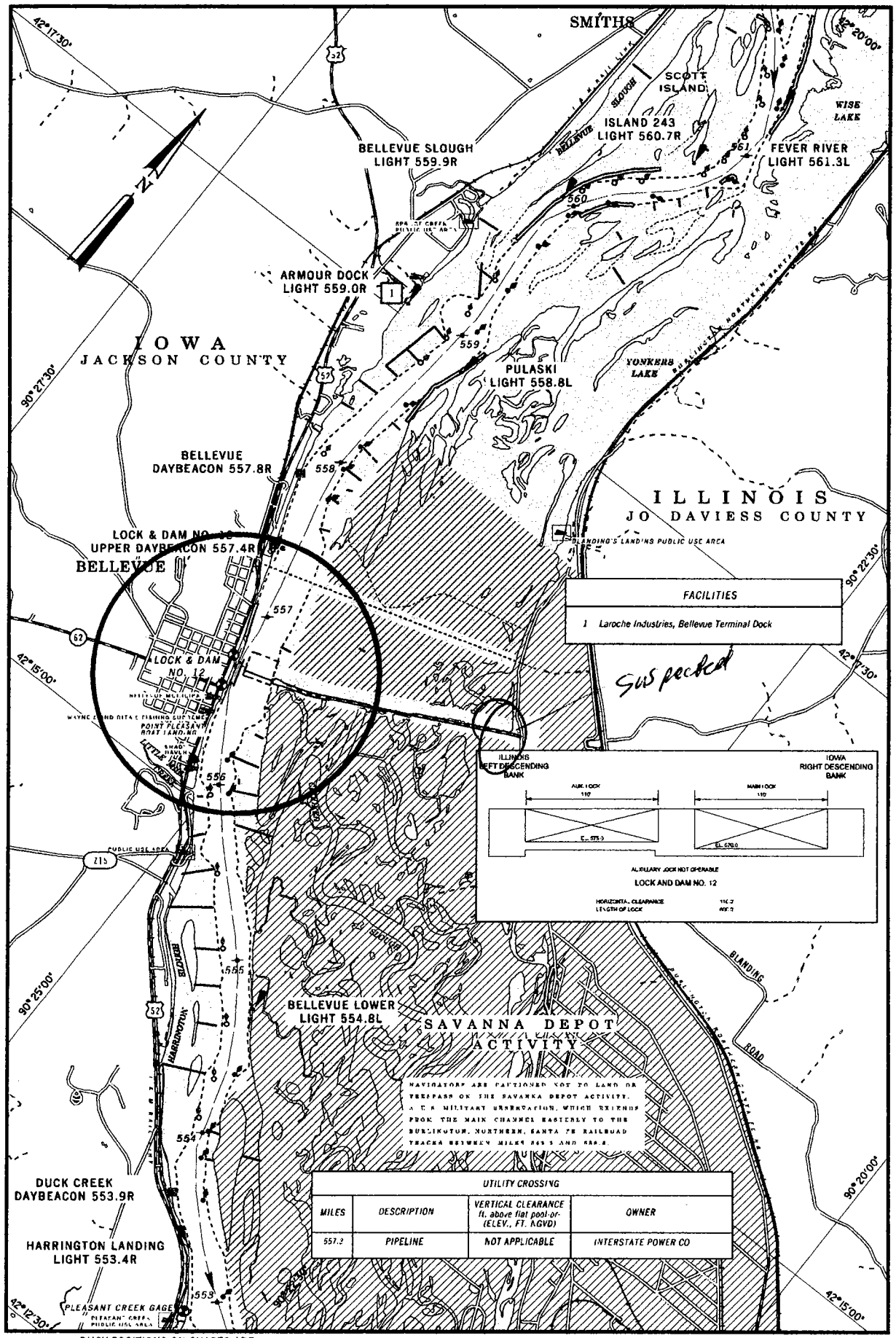
1 1/2 0 1 MILE

1 .5 0 1 KILOMETERS

MAP NO. 46
RIVER MILE 560 TO 568



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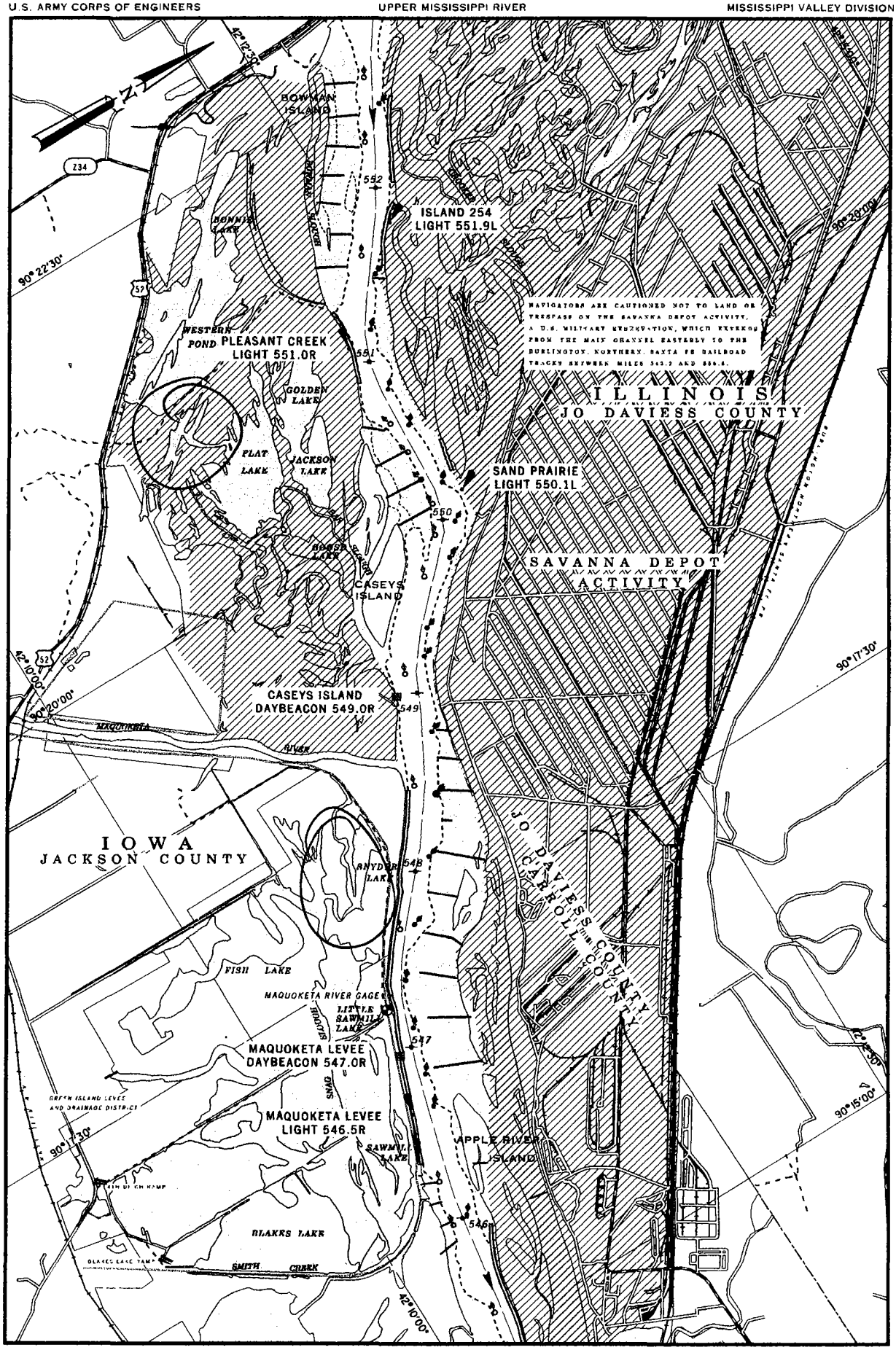
MAP NO. 47
RIVER MILE 553 TO 561



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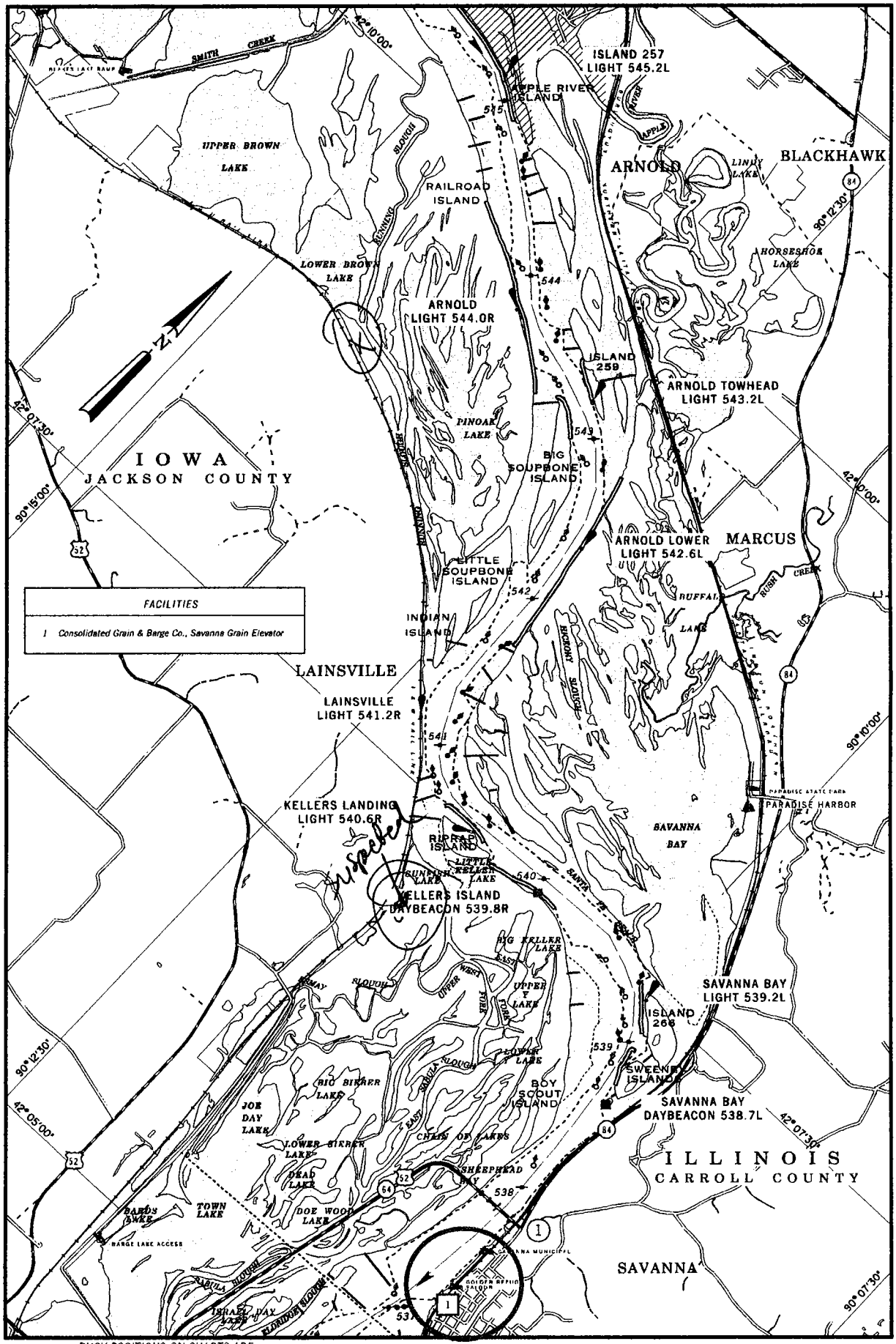
5 0 1 KILOMETERS

MAP NO. 48

RIVER MILE 546 TO 552



2001 BUOY POSITIONS ON CHARTS ARE APPROXIMATE, SEE NOTICE ON LEGEND NO. 1

SCALE 1:31,680
1 INCH = 1/2 MILE

1 1/2 0 1 MILE

1 .5 0 1 KILOMETERS

MAP NO. 49

RIVER MILE 537 TO 545