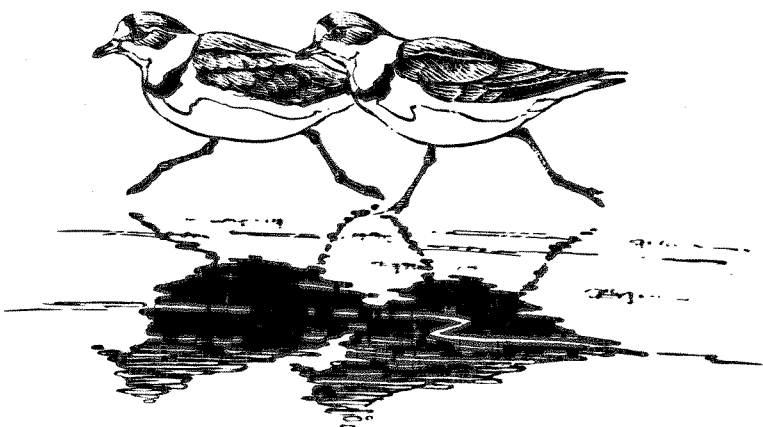


ST. LOUIS RIVER ESTUARY COLONIAL BIRD PROGRAM 1984

Prepared by: Metropolitan Interstate Committee,
a joint venture of the Arrowhead Regional Development Commission
and the Northwest Regional Planning Commission

Prepared for: The State of Minnesota, Department of Natural Resources



La. 5/19/84

COLONIAL BIRD PROGRAM
ST. LOUIS RIVER ESTUARY
1984

Prepared for: the Minnesota Department of Natural Resources, Nongame Program

Prepared by: the Arrowhead Regional Development Commission

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BACKGROUND

The St. Louis River estuary is a site reknown for its colonial waterbirds. Due to the special status given them by state and federal agencies, the nesting populations of the Common Tern and Piping Plover are of particular interest. The tern has an official status of Special Concern in Minnesota (6 MCAR 1.5600) and is considered a species of Special Emphasis in Region 3 (Regional Resource Plan, USFWS, 1983) by the U. S. Fish and Wildlife Service. The State of Wisconsin, which shares the estuary with Minnesota, considers the tern endangered. The Piping Plover has an official status of Endangered in Minnesota (6 MCAR 1.5600) and Wisconsin and is under consideration for federal Threatened status. The history of these species in the estuary and the urgent need to intensively monitor and manage their populations has been thoroughly documented (Davis et al. 1978, Niemi et al. 1979, Arrowhead Regional Development Commission 1982, 1983).

During the past several years, the Arrowhead Regional Development Commission (ARDC) has played a lead role in advocating and implementing various management practices regarding Common Terns and Piping Plovers nesting in the estuary. These efforts coalesced in 1983 when ARDC and the Minnesota Department of Natural Resources (MDNR) Nongame Wildlife Program initiated a comprehensive, coordinated Colonial Bird Management Program for the estuary. The MDNR contracted ARDC to oversee and implement the program.

The need for and goals of the program are given in some detail in the report which was submitted to the MDNR following the 1983 work (ARDC, 1983). The overall objectives are:

1. To monitor the nesting status of the Common Tern and Piping Plover in the St. Louis River estuary, and
2. To implement various plans to protect and preserve the Common Tern and Piping Plover populations including development of secure and suitable nesting sites.

One of the major components of the program has involved work on two islands located near the major tern and plover nesting area in the estuary - Hearing and Interstate Islands. These islands are being developed as Common Tern and Piping Plover nesting areas. The plan is to clear woody vegetation from portions of the islands to create open, sandy beach where terns and plovers can nest. Approximately 11 acres of Hearing Island were cleared for this purpose in the spring of 1983. To actively encourage birds to use the island, a system of tapes and decoys has been used. Interstate Island will be managed in a similar manner once easements have been secured from private landholders.

The program was continued in 1984 and ARDC once again was contracted by the MDNR to implement it. This report presents the results of this second year's efforts.

WORK ELEMENTS

ARDC's 1984 work program included the following major elements:

1. To assist the MDNR in implementing plans for Hearding and Interstate Island Wildlife Management Areas.
 - a. To consult with the MDNR regarding on-site vegetation management on Interstate Island.
 - b. To serve as a local liaison and coordinator between the MDNR, local government, Port Authority staff, U.S. Army Corps of Engineers staff, local citizenry, and private property owners in order to protect existing tern and plover colonies.
2. To implement plans for attracting Common Terns and Piping Plovers to both Hearding Island and Interstate Island and to monitor the success of these efforts.
3. To implement plans to discourage Ring-billed Gull use of Hearding Island.
4. To implement plans to discourage tern and plover use of select traditional nesting sites that are highly disturbed or developed and where chances of nesting success are poor.
5. To census the Common Tern, Piping Plover, and Ring-billed Gull nesting populations in the St. Louis River estuary.

METHODS

The major work elements and their temporal relationship to important biological events (e.g., hatching dates) are presented in chronological order in Table 1.

Breeding Populations

All traditional nesting sites as well as any others which came to light via communication with local bird watchers and ornithologists were censused. Although Wisconsin colonies were not directly involved in this work, information was sought regarding populations in those portions of the estuary as well as nearby areas of Lake Superior.

Breeding populations were determined in the same manner as in 1983. All nests at each site were counted during intensive ground searches conducted during the peak of incubation. In general, each colony was searched only once, but in the case of multi-species sites, repeated counts were made in accordance with the peak incubation period of each species present. Survey data collected included the number of nests and the number of eggs and/or chicks associated with each nest. Total populations for each site and each species were calculated using these data.

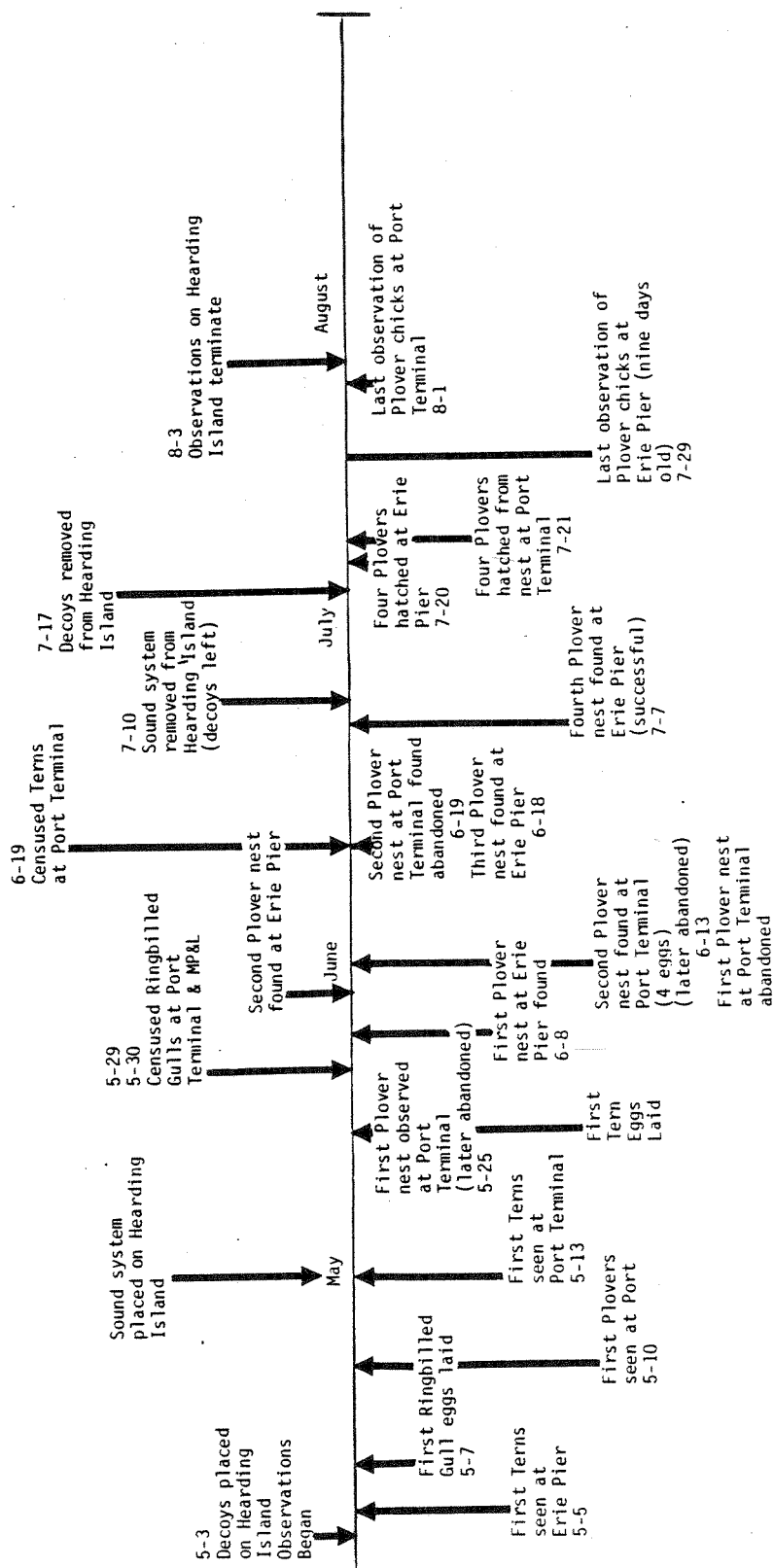
An attempt was also made to determine the nesting success of Piping Plovers in the estuary. All nests were examined periodically (approximately once every two days) to determine the number of surviving eggs and/or chicks. During incubation these examinations usually consisted of observations made from a distance using a spotting scope or binoculars, although direct examinations of the nests were occasionally made when no adults were nearby. This allowed eggs to be counted without disturbing the adults. Once the eggs hatched, survival was determined by searching the area surrounding each nest for chicks.

All chicks were leg-banded with standard U.S. Fish and Wildlife bands and a yellow plastic band shortly after hatching (See Appendix A for details of banding patterns). The banding was done by Terry Wiens who has been working with plovers in the Lake of the Woods area; the banding patterns used will allow birds from the harbor to be distinguished from birds banded at Lake of the Woods. Young birds were monitored until they no longer could be located (early August).

Although not funded as part of this project, additional data were collected regarding the nesting success of Common Terns at the Port Terminal and the Sky Harbor Airport. This work was done by Joan McKearnan as part of her graduate work in the Department of Biology, University of Minnesota, Duluth. Her efforts were part of a broader study of tern nesting success in Minnesota and was funded under separate contract by the MDNR Nongame Program.

McKearnan's project primarily involved a study of egg and chick survival at marked Common Tern nests. Egg losses were assessed via periodic nest inspections while chick mortality was determined by leg-banding newborns and then regularly inspecting the nesting area for live and/or dead leg-banded chicks. A comparison was to be made between groups of nests which had been

Table 1. Chronology of major events and tasks performed.



isolated with wire enclosures and groups which had not. This procedure was done as part of a U.S. Fish and Wildlife Service program to assess nesting success of Common Terns at select colonies throughout the Great Lakes. For details on the results of this work, the reader is referred to the report made by McKearnan to the MDNR.

Implementation of Hearding Island Plan

Tern decoys and tapes of calling Common Terns were used to attract birds to the island. The decoys were provided by the WDNR and consisted of life-size plaster-of-paris units. Metal rod "legs" which protruded from the bottom of each decoy were pressed into the ground to keep them in place.

A total of 16 decoys were placed in the managed area. They were arranged in pairs with at least one of each pair being placed in an incubating position. The pairs were spaced approximately two meters apart and the entire assemblage was located in the open sandy area which had been cleared. The decoys were a minimum of 100 meters from trees or brush and approximately 70 meters from the beach on the harbor side of the island (see Map 1). The decoys were placed on the island on May 3 and left there until July 17 (approximately ten weeks).

A portable tape playback system, similar to that used during 1983, was used in conjunction with the decoys. This system was comprised of a car cassette player, a deep discharge marine battery, and two waterproof PA speakers (see Figure 1). All but the speakers was buried in a watertight container. The speakers were placed approximately 25 meters apart and on either side of the decoys. The tape was a continuous play loop. The playback consisted of Common Tern calls copied from a tape acquired from Cornell University. The system was turned on and off automatically by a photocell. Thus the tape played during daylight hours only.

The playback system was operated from May 15 until July 10. With the exception of a few days during which the battery was being recharged and when there was a temporary malfunction of the tape, the system operated all daylight hours in that time period.

Bird use of the managed area and behavioral responses to the decoy-tape system were determined by on-site observation. All observations were made from a canoe situated just off the bayside of the island (see Map 1). This allowed usage to be determined without undue disturbance.

Observations were made from early May through early August. In contrast to 1983, observations were limited in time (one to two hours per observation period) - the primary purpose being to see if any nesting had taken place rather than to document behavioral responses. The status of the management area was determined approximately every three days until the decoys were removed.

Implementation of Interstate Island Plan

This work element consisted of coordination and liaison between the private landholders (Burlington Northern Railroad and C. Reiss Coal Co.), the MDNR, the WDNR, and the Nature Conservancy, and of securing funds from the State of

HEARDING ISLAND WILDLIFE MANAGEMENT AREA

Map 1 LOCATION OF DECOYS AND OBSERVATION SITE

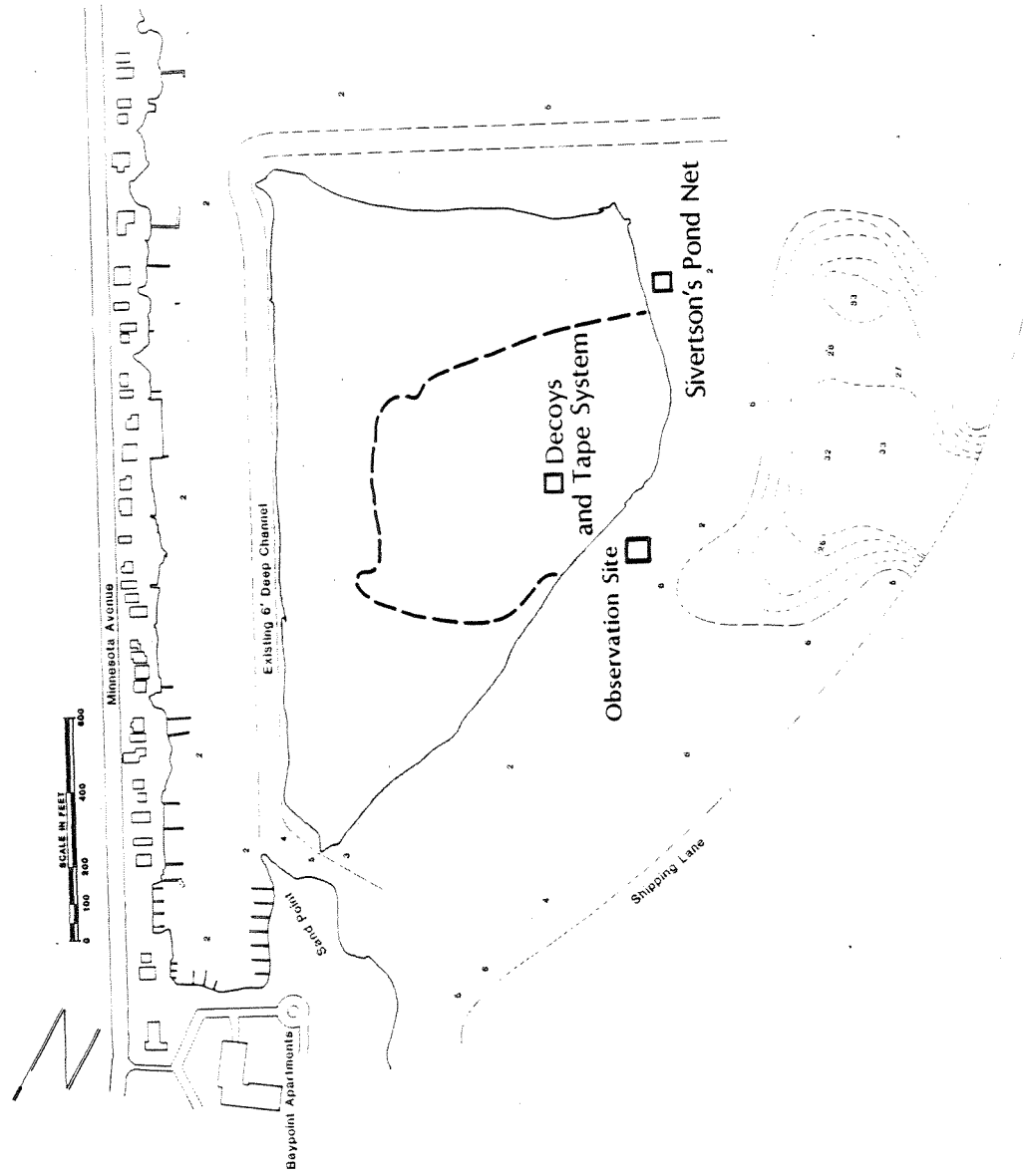
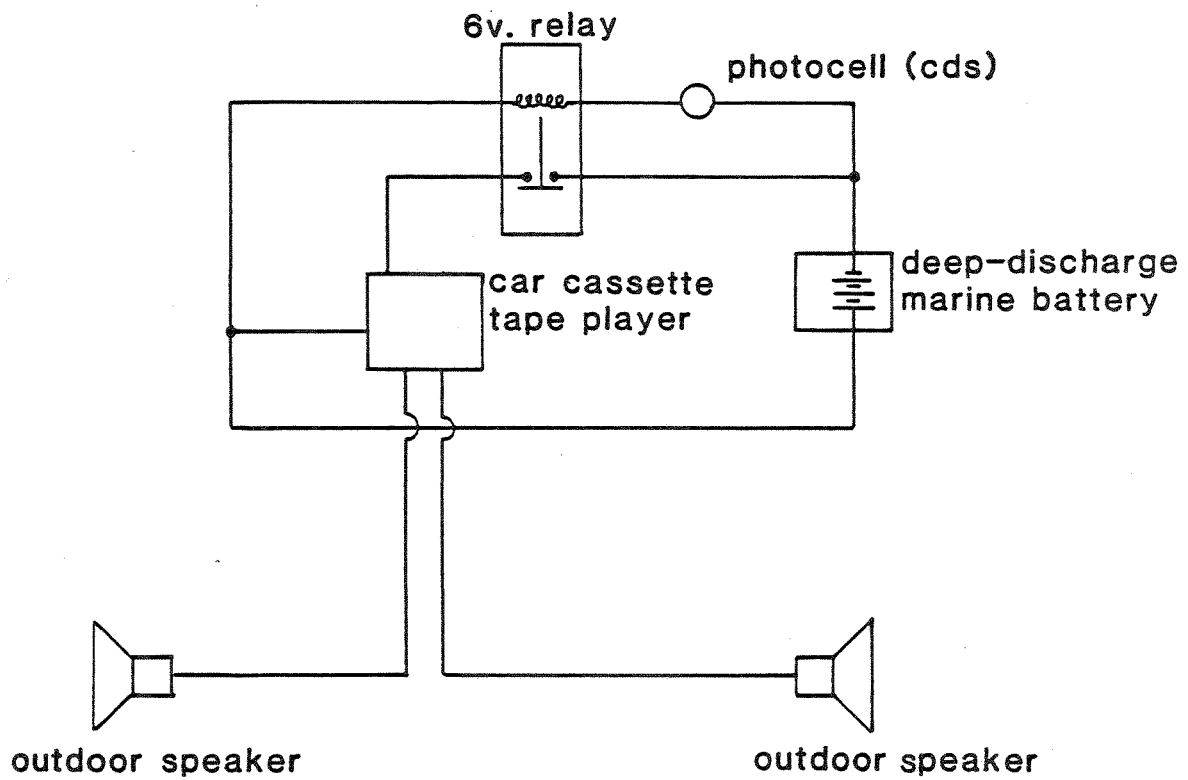


FIGURE 1. PLAYBACK SYSTEM.



Wisconsin Coastal Management Program for the conduct of a boundary survey of the island. The survey was needed in order to complete the negotiation of easements with Burlington Northern Railroad which owns a portion of the island. ARDC staff facilitated completion of the latter survey and coordinated between the survey crew and MDNR staff to assure that the resultant maps would prove acceptable for the easement negotiations with the private landholders.

Nest Discouragement Activities

Terns and plovers were actively discouraged from using two areas - the Erie Pier site, where nesting occurred in 1983, and a small fenced-in area at the Port Terminal which is the designated site for burning dunnage from incoming ships. Several techniques were used including erecting scarecrows, placing colored plastic flagging on the ground, and repeatedly walking through the areas to create "human disturbance".

Both of the above sites are considered unsuitable nesting areas. The Erie Pier is the primary dredged material disposal site in the harbor and, as has been true in the past, the tern and plovers appear to find it attractive. Unfortunately, once disposal operations are completed (in ten years), this site will most likely be developed for industrial purposes. Thus the terns and plovers would be confronted with the same undesirable situation as they presently are at the Port Terminal site. Birds were discouraged from using the dunnage burning area since it was feared that required burning would occur at inopportune times and destroy any nests in the area. The burning is mandated by law and its occurrence cannot be predicted.

The other discouragement activity which took place consisted of placing a Great Horned Owl decoy on Hearding Island. The decoy was placed on top of a 10 foot wooden pole stuck in the ground within the managed area and near the bayside shoreline of the island. This was done early in the spring prior to the arrival of terns and plovers and was to discourage Ring-billed Gulls from nesting on the island. The decoy was removed as soon as the first terns were sighted in the harbor.

RESULTS and DISCUSSION

Breeding Populations

Five colonial bird nesting sites were examined in the Minnesota portion of the estuary and four of these were found to be active (Map 2). With the exception of the Erie Pier confined disposal area, all are traditional nesting sites which have been used for several years. The Erie Pier site was first noted as a colonial bird nesting area in 1983 when both Common Terns and Piping Plovers were found nesting there.

Other locations used as colonial bird nesting sites include the Port Terminal, Sky Harbor Airport, and the spit at Minnesota Power's Hibbard Power Plant. All of these sites have been described previously (Davis and Niemi 1980). It is worth noting that one additional site, the Grassy Point islet, was not used this year despite the fact that 20 pair of terns nested there in 1983. It appears that this site is used on an intermittent basis.

One Common Tern nesting area was reported in the Wisconsin portion of the estuary also. This is a small sand spit located near the end of Wisconsin Point. The spit has been used by terns as a roosting site regularly in the past, especially during the post-fledge stages of nesting. Terns nested here previously in 1977 and 1978 (Niemi et al. 1979), although the number of birds and nesting success are unknown. There also is a previous record (1977) of a Piping Plover nest in this area (Niemi et al. 1977), although the nest was destroyed by an off-road vehicle. This site is subject to great disturbance by off-road vehicles and general human activity. Approximately 15 pairs of terns attempted to nest here this past year, but none were successful as the eggs were broken - apparently due to human activity (Fred Strand, WDNR, pers. comm.). There were no reports of Piping Plover nests in the Wisconsin portion of the estuary.

The breeding populations at each site and the estuary totals for each species are given in Tables 2 and 3. Data from previous years are included also.

Ring-billed Gull

The Ring-billed Gull nested in two areas during 1984 - the Port Terminal site and the small spit of land at the Minnesota Power (MP) Hibbard Plant. The overall population of this species continued the dramatic increase which has been noted since the first major influx into the estuary (1974). The 1984 population was 15,730 breeding birds or 28% higher than in 1983. As has been true the past several years, the increase took place exclusively at the Port Terminal site (from 11,216 breeding birds in 1983 to 14,206 breeding birds in 1984).

The population at the MP site, as in 1983, was nearly 40% smaller than in earlier years. As was noted in 1983, this decrease appears to be due to changes in the substrate and vegetation of the inner portions of the spit. These changes occurred during 1983 and were apparently caused by construction equipment associated with the new Bong Bridge (See 1983 report for details on these changes). Bridge construction activities this past year did not appear to affect the colony, although no nesting success data were gathered. A

DULUTH-SUPERIOR HARBOR MANAGEMENT PROGRAM

MEMORANDUM, INTERSTATE COMMITTEE
Development Committee and the
National Wildlife Refuge System

Map 2

RING-BILLED GULL, COMMON TERN,
AND PIPING PLOVER NESTING SITES
AND MANAGED AREAS, 1984

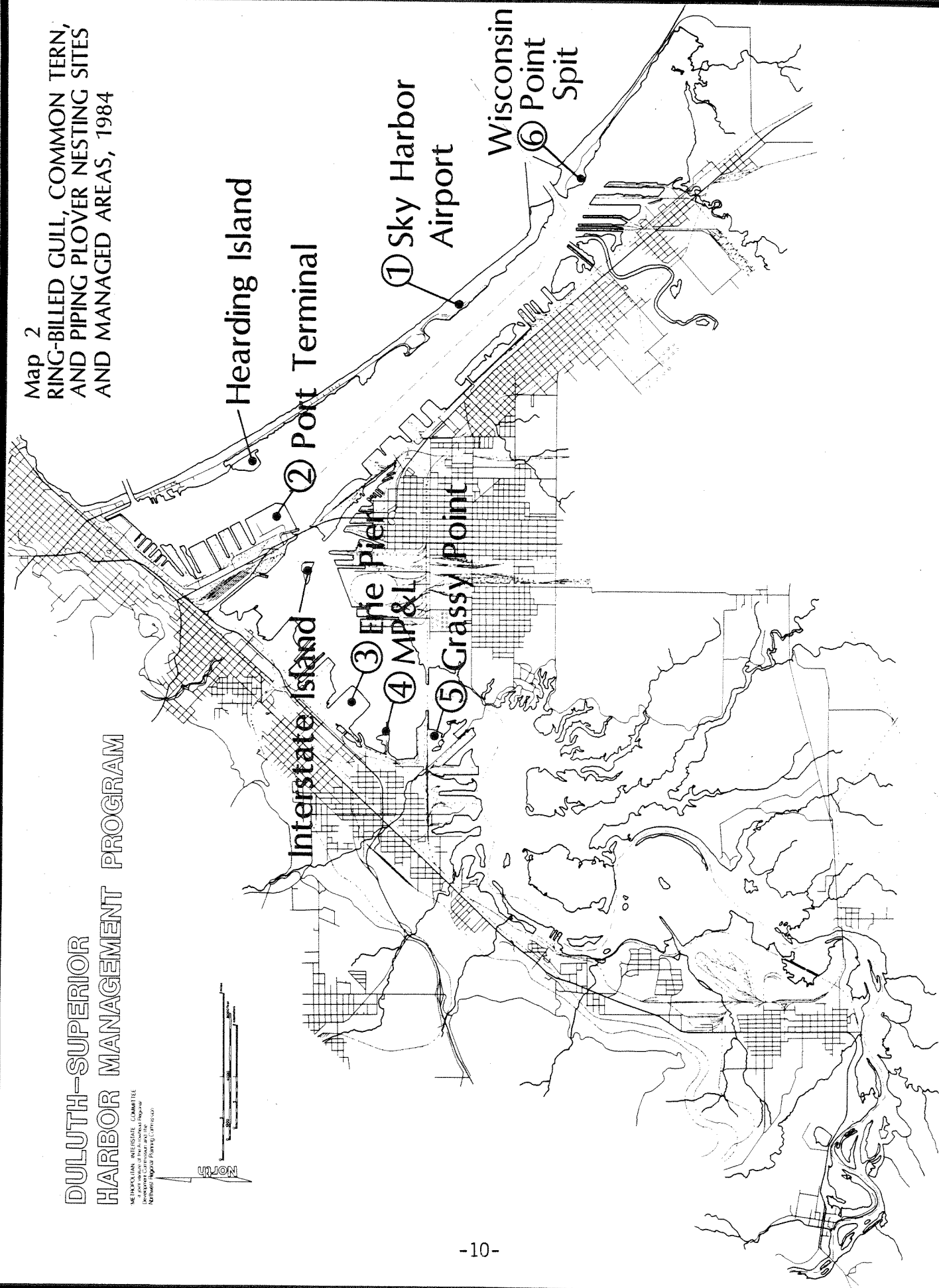


Table 2. Breeding populations of Common Tern, Ring-billed Gull, and Piping Plover at five colony sites in the St. Louis River estuary, 1977-1984.

Site No. (See Map 1)	Location	Species	Breeding Adults										
			1977	1978	1979	1980	1981	1982	1983	1984			
1	Sky Harbor Airport	Common Tern	16	14	18	26	20	34	58	58			
2	Port Terminal	Common Tern	370	296	356	322	454	380	244	226			
		Ring-billed Gull	468	1,946	2,954	7,878	7,494	No Data	11,216	14,206			
		Piping Plover	12	12	10	6	8	4	6	4			
3	Erie Pier	Common Tern				No Data	No Data	No Data	48	8			
		Piping Plover				No Data	No Data	No Data	4	4			
4a	Minnesota Power Hibbard Plant	Common Tern	8	6	10	0	0	No Data	0	0			
		Ring-billed Gull	1,146	2,454	2,546	2,744	2,448	No Data	1,502	1,524			
4b	"Islands" near Hibbard Plant	Ring-billed Gull	360	722	354	306	No Data	No Data	No Data	No Data			
5	Grassy Point Islets	Common Tern	22	40	36	No Data	No Data	No Data	44	0			
		Ring-billed Gull	112	152	156	No Data	No Data	No Data	0	0			
6	Wisconsin Point	Common Tern	?		0	No Data	No Data	No Data	No Data	30			

Table 3. Total breeding populations of the Common Tern, Ring-billed Gull, and Piping Plover in the St. Louis River estuary, 1977-1984.¹

Species.	Breeding Adults							
	1977	1978	1979	1980	1981	1982	1983	1984
Common Tern ²	416 (394)	356 (316)	420 (384)	348 (348)	474 (474)	414 (414)	394 (350)	322
Ring-billed Gull ³	2,086	5,324	6,010	10,928	9,942	No Data	12,718	15,730
Piping Plover	14	12	10	6	8	4	6-10 ⁴	8

- 1 Data for 1977-79 taken from Davis and Niemi (1980) and Niemi et al. (1979); Data for 1981-82 unpublished data (Davis); Data for 1983 from present study.
- 2 Figures in parentheses exclude Grassy Point population.
- 3 Data for Ring-billed Gull populations include small islands near MP&L spit for 1977-79, but not for 1980-84.
- 4 Exact number of breeding Piping Plovers unknown since two nests may have been re-nesting attempts. These figures represent minimum and maximum.

permit variance allowing some activity on the bridge superstructure to occur during the nesting season was granted by the U.S. Army Corps of Engineers, but only after consultation with and approval by personnel associated with the present project.

As in 1983, Ring-billed Gulls used the bayside beach of the Hearing Island Management Area extensively as a roosting area. Some gulls were observed feeding in the upland portions of the island also. However, no attempts at nesting were noted. This species also roosted at the Erie Pier in moderate numbers, but again, no nesting was reported.

Common Tern

The Common Tern was found nesting at four sites in the estuary. Two of these, the Port Terminal and the Sky Harbor Airport, are considered traditional nesting sites. The other two include the Erie Pier site, which was first used in 1983, and the previously discussed sand spit at the end of Wisconsin Point. It has already been pointed out that no nests were found on the Grassy Point islet which had been used in 1983. No birds attempted to nest on the Hearing Island Management area in 1984 nor were any attempts reported by the WDNR at the Barkers Island Management Area (Fred Strand, pers. comm.).

The overall estuary breeding population of Common Terns in 1984 was difficult to determine since there were large nest losses and an accompanying large number of renesting attempts. Thus nesting was asynchronous making it difficult to make a definite count of breeding birds via nest counts. The best estimate appears to be that 320 breeding adults were present in the estuary (including the 30 individuals at Wisconsin Point). This figure is the lowest recorded since accurate reports have been kept (1977) and continues a four year decline in the tern population.

The decline in breeding terns reflects a slight decrease at the Port Terminal colony (down 7% from 1983) and the lack of nesting at the Grassy Point islets (22 nests in 1983). The hypothesized reasons for the continued decline at the Port Terminal are as in previous years - a continued decline in open habitat, increasing numbers of Ring-billed Gulls, and continued high levels of disturbance.

As noted in 1983, there is some possibility that terns which formerly nested at the Port Terminal are now nesting at nearby Ashland and Washburn, Wisconsin sites. These colonies are located on the south shore of Lake Superior and just 70 miles from the St. Louis River estuary. Recent efforts by the WDNR to provide more nesting habitat have resulted in an increase in these populations the past two years. They have reported increases of approximately 50 breeding birds each of the past two years. It is possible that some of the St. Louis River estuary's population has relocated at this site. Tern chicks have been leg-banded in the Duluth-Superior harbor on several occasions including the 1979, 1982, 1983, and 1984 breeding seasons and this year a leg-banded adult was reported at Ashland. Although the bird was not captured and the band number not known, this further hints that there may be some movement between the two areas. No birds have been leg-banded at Ashland.

Use of the new Erie Pier site has already been mentioned. 1984 represents the second year that terns have nested at this site. This occurred despite ongoing discouragement of nesting (see METHODS - Nest Discouragement Activities). It should be noted that initially 30 adults attempted to nest here, but due to the discouragement tactics, most of these left. Many of these birds went as far as to make scrapes, but subsequently deserted them. Only four pair remained to actually nest at this site. Nesting activity at this site was different than in 1983 in that the initial attempts coincided with initial attempts at the Port Terminal colony - indicating that these were not birds attempting to re-nest as was suspected in 1983. The nesting population of terns at the Sky Harbor Airport remained the same as in 1983, thus sustaining the higher population seen there during the last two years.

Based on the work of McKearnan, the overall nesting success of terns in the estuary was quite poor once again (McKearnan, pers. comm.). A very low percentage of eggs hatched at the Port Terminal as many were lost due to predation or various types of disturbance. Even nests within the wire enclosures, intended to keep predators out, experienced total egg losses. The cause of these failures remains unknown. In contrast to 1983, a large portion of eggs did hatch at the Sky Harbor Airport colony in 1984. Of 77 eggs laid, 42 hatched. In 1983, of 82 eggs laid, only four hatched. However, as in 1983, the number of chicks reaching fledgling age was quite low at this site. Only two and five chicks fledged in 1983 and 1984 respectively. The reason for the difference in hatching success these two years is not clear. It is especially puzzling since major construction activity, associated with the addition of a taxiway, was underway the entire 1984 nesting season. It was expected that this would worsen the poor nesting results seen in 1983. Of course, the latter activity may account for the subsequent poor fledging rate observed in 1984. A more detailed discussion of this is given in McKearnan's report to the MDNR.

Piping Plover

The breeding status of the Piping Plover was much the same as has been reported during the past several years. A total of seven nesting attempts were recorded, four at the Erie Pier and three at the Port Terminal site. Three of these appeared to be renests which occurred following abandonment or destruction of earlier nests. Four pair of adults were observed - two each at the Port Terminal and the Erie Pier. As in 1983, one pair of plovers was observed at Ashland, Wisconsin also.

Of the seven nesting attempts by Piping Plovers, only two, one each at the Erie Pier and the Port Terminal, successfully hatched eggs. Both of these were renests and thus occurred relatively late in the summer. The five nests which were unsuccessful were apparently lost due to predation and disturbance. The successful nests both had four egg clutches and all four eggs hatched in each case. The fate of the chicks is unknown, although the lateness of their hatching raises serious doubts as to whether they survived. Chicks were seen as late as July 29 at the Erie Pier and August 1 at the Port Terminal, corresponding to ages of 9 and 10 days respectively. Lone adults were observed in the nesting areas after these dates, but no chicks were seen at these times. No dead plovers were found in either nesting area. The nesting status of the plovers at Ashland, Wisconsin was not determined.

Hearding Island Project

Bird Use

No positive results were noted with respect to the Harding Island project in 1984. Although observations were not as intense as during 1983, there is no doubt that neither terns nor plovers tried to nest on the island. This contrasts with the surprising success of 1983 when a pair of terns attempted to nest on the island. Terns did respond to the attraction system as indicated by hovering flights over the decoys. The intensity of this activity is not known since the emphasis was on short-term observations. However, this response was noted on several occasions.

No plovers were observed in the managed area this year. This does not necessarily imply that usage was lower than in 1983 when several reports of plovers feeding in the upland portion of the island were made, but probably reflects the difference in observation techniques between the two years (time-intensive in 1983 and not in 1984).

The lack of success this year may have been due to the presence of a Great Horned Owl on the island. This bird was first observed well before breeding terns and plovers returned to the harbor in the spring. Several attempts were made to trap the owl, but they were unsuccessful and it was seen on the island throughout the study. Its presence did not seem to affect the Ring-billed Gulls feeding in the management area but may have discouraged terns and plovers from nesting on the island.

Site Conditions

The managed area appeared to provide excellent tern and plover nesting habitat during the arrival and courtship period. However, much of the area was quite overgrown with tall herbaceous vegetation by the end of the summer. This vegetation did not present any major problems this year, but may do so in the near future and a vegetation control program may be required. As had been anticipated, the higher mounded areas remained essentially vegetation free, but these represent only a small portion of the managed area. There was no evidence of any serious wind erosion problems.

Interstate Island Implementation

Progress continued towards implementation of the Interstate Island Wildlife Management Plan. The major accomplishment was the completion of a certified survey and boundary map of the island. ARDC secured funds for this work from the State of Wisconsin Coastal Management Program. The map was used to finalize easement negotiations between Burlington Northern Railroad (BN), the State of Minnesota, and the Nature Conservancy. Basically the proposed easements are a trade for land rights. BN is being given an easement on a 200 foot wide strip of land abutting its trestle. This land is owned by the State of Minnesota. In exchange, BN is giving easement rights to the Nature Conservancy for lands in the Wisconsin portion of the island. These lands will become a part of the colonial bird management area.

The necessary easements were approved by the Executive Council of the State of Minnesota at its September meeting and all that remains to complete them is for Burlington Northern to the necessary signatures. The island will be cleared as soon as this occurs and thus site work should be completed this fall. The WDNR has already encumbered monies to transport the necessary equipment to the island.

The C. Reiss Coal Company, the other landholder in the Wisconsin part of the island, decided not to participate in the project. Although their cooperation was desirable, the boundary survey revealed that the company owns only a very small piece of land. The project will not be materially affected by this action.

SUMMARY

The following represent the major findings of the 1984 St. Louis River estuary colonial bird program. Although organized by topic area, no priority of importance is intended.

I. Breeding Populations

A. Sites - Six colonial bird nesting sites were located in the estuary. Most of these were traditional nesting areas, although terns did attempt to nest near the end of Wisconsin Point - a site which was last used in 1978. For the second year in a row, both terns and plovers nested at the recently formed land mass at the Erie Pier dredged material disposal site also. It should be noted that no terns used the Grassy Point islets as has been true on occasion in the past.

Ring-Billed Gulls nested at the MP Hibbard Power Plant and the Port Terminal, the latter being a significantly larger colony. Common Terns nested at the Port Terminal, Erie Pier, Sky Harbor Airport, and Wisconsin Point. The Port Terminal continued to be the largest colony in the estuary. Piping Plovers nested at the Erie Pier and the Port Terminal.

B. Populations and Nesting Success

1. The Ring-billed Gull population continued its dramatic increase, most of this occurring at the Port Authority site. The number of breeding adults in the estuary increased from 12,718 in 1983 to 15,730 in 1984 (28% growth). Nesting success of this species was not determined, but appeared to be quite high.

2. The Common Tern population continued its steady decline of the past several years. Due to asynchronous nesting, it is difficult to make an accurate determination of the number of breeding adults, but it appears that approximately 322 adults nested in the estuary. This is down 7% from 1983. Most of the decline could be accounted for by the lack of nesting at the Grassy Point islets (22 pair in 1983). Terns experienced very poor nesting success as has been the case the past several years.

3. It appeared that four pairs of Piping Plovers were present in the estuary. Due to abandonment and destruction of several of their nests, these eight birds actually made seven nesting attempts during the summer. All but two of were unsuccessful in hatching eggs. The last attempt by each pair took place late in the summer and all four eggs in each did hatch. The fate of the chicks is unknown.

II. Hearding Island Project

A. Nesting - no terns or plovers nested on the island this year, although terns were occasionally seen hovering over the attraction system. The absence of nesting may have been due to the presence of Great Horned Owl on the site.

B. Site Conditions - The management area provided a large tract of what appeared to be suitable nesting habitat, although it was quite overgrown with tall herbaceous vegetation by August. No problems with wind erosion were noted. Removal of this vegetation may be required within the next two years.

III. Interstate Island Project

The island was surveyed and a boundary map produced. This is being used to finalize agreements with private landholders. The island probably will be cleared this fall and active management begin next spring.

RECOMMENDATIONS

The following recommendations are meant to convey specific actions and management practices which will best help realize the goals of the St. Louis River estuary colonial bird program. Several of them were mentioned and discussed in the 1983 report (ARDC 1983), and the reader is referenced to the latter document for more details and to put the present recommendations in context. The order of listing does not convey priority as all but #8 and #9 are considered crucial to the success of the program.

1. Efforts to manage Interstate Island as colonial bird nesting habitat should continue. Assuming that the island is cleared this fall, active management techniques similar to those used on Hearding Island the past two years (decoys and tapes) should be implemented next spring. Due to its location near the Port Terminal and remoteness from human activity, this site is probably the best in the entire harbor for creating additional nesting habitat.
2. The presence of a Great Horned Owl on Hearding Island continues to be of concern. If this a problem again next year, efforts to remove any individuals present on the island should be repeated. This effort probably needs to be intensified in light of the failure this past year to capture the bird. Trapping efforts should begin in late winter. Advice and assistance from local raptor trappers (e.g., David Evans, Hawk Ridge Nature Reserve) should be sought.
3. Human activity on Hearding Island was not the problem during 1984 that it was in 1983. Thus it is recommended that the approach used this past year be repeated in 1985. This included posting the Management Area No Trespassing from April 1 through August 30. Contact with the Park Point Community Club and the Sand Point Yacht Club should be maintained and, as was done this past year, a special effort made to talk with them just prior to the next nesting season.
4. Although no Ring-billed Gulls nested on Hearding Island, their continued use of it as a feeding and roosting area warrants continued monitoring - especially during the early spring weeks before the terns and plovers arrive.
5. A plan for removing invading herbaceous vegetation in the Management Area on Hearding Island should be made. Although there probably will not be any serious problems next spring, the vegetation is encroaching at a rapid rate and some control is advised in the near future. Some action should be taken next year. More long-term methods of vegetation control should be examined also (e.g., introduction of natural controls such as meadow voles).
6. The effort to discourage terns and plovers from nesting at the Erie Pier site should continue. Although the area has become quite large, human presence on the site seemed to be the most effective measure this past year.

7. The strategy at the Duluth Port Terminal should be re-examined in light of the continued lack of nesting success. It is recommended that a program to discourage terns and plovers from the entire area be given strong consideration. Evidence from this year's work suggests that direct human presence and planned disturbances would work the best, although several other approaches could be used.

8. Despite the fact that no nesting occurred on the small islets near Grassy Point this year, this site continues to merit consideration for development of additional nesting space for Common Terns. The recommended actions include continued surveillance of this site during the next few years. Should nesting occur once again, plans to increase the size of the islets should be given serious consideration (SEE 1983 Report). These plans could be formulated and implemented as part of an overall management plan for the Grassy Point area. The ARDC has compiled preliminary data and recommendations pertaining to designation of Grassy Point as management area.

9. Since it is possible that breeding terns from the estuary are relocating in the Ashland, Wisconsin area, it is recommended that a banding program which would allow birds from these two areas to be distinguished be initiated. The obvious approach would be to use colored leg-bands.

REFERENCES

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Arrowhead Regional Development Commission. 1982. Proposed Management Plan for the Hearding Island Wildlife Management Area. Report to the Minnesota Department of Natural Resources, Nongame Program, St. Paul, Minnesota. 32 pp. and appendices.

Arrowhead Regional Development Commission. 1983. St. Louis River estuary colonial bird program, 1983. Report to the Minnesota Department of Natural Resources, Nongame Program, St. Paul, Minnesota. 31 pp. and appendices.

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APPENDIX A

PLOVERS BANDED IN DULUTH 1984

JULY 21:

Nest at Erie Pier hatched two (2) chicks on July 20 and the other two (2) on July 21. All four (4) chicks banded on July 21, the first three (3) at 0830 and the last in the afternoon:

#951-54157

*Y AT	Blank
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Erie Pier

#951-54158

Erie Pier

#951-54159

Erie Pier

#951-54160

Erie Pier

JULY 22:

Nest at Port Terminal hatched three (3) chicks - one (1) egg starting to pip at 2000. Three (3) chicks banded at 2000:

#951-54161

Y AT	Blank
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Port Terminal

#951-54162

Blank	Y AT
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Port Terminal

#951-54163

Port Terminal

JULY 23:

Final egg of Port Terminal nest hatched: banded the chick at 0940:

#951-54164

Blank	Y AT
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Port Terminal

* Y = Yellow plastic band

AL = Standard U.S. Fish and Wildlife aluminum band