

ST. LOUIS RIVER ESTUARY
COLONIAL BIRD PROGRAM

1990

Prepared for: Minnesota Department of Natural Resources
Nongame Wildlife Program

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Submitted: December 1990

BACKGROUND

This is the eighth in a series of annual reports on the St. Louis River Estuary Colonial Bird Program. The purpose of this program is to provide safe and secure long term nesting areas for Common Terns (*Sterna hirundo*) and Piping Plovers (*Charadrius melodus*) in the St. Louis River Estuary and to establish breeding populations of terns and plovers that are self-sustaining. This program was implemented by the Minnesota Department of Natural Resources (MDNR) and the Wisconsin Department of Natural Resources (WDNR); it is a cooperative project between the two states, as well as with other government agencies and private groups.

The Piping Plover is Endangered in both states as well as federally. The Common Tern is listed as a species of Special Concern in Minnesota, Endangered in Wisconsin, and a species of Special Emphasis by the U.S. Fish and Wildlife Service.

It is assumed that the reader is somewhat familiar with this program; therefore, this report only briefly references the background and history of the program. For more detailed information see earlier reports (Davis 1980, 1982-1987; Penning 1988, 1990). In 1983 a program to monitor population trends of Piping Plovers, Common Terns, and Ring-billed Gulls (*Larus delawarensis*) was implemented. For data on these species in the estuary prior to 1983 refer to Davis 1983. A tern relocation program was formulated in 1978 (Metropolitan Interstate Committee 1978). By 1981 habitat management began on Barkers Island with the clearing of 8 acres. In 1983 13 acres were cleared on Herding Island. In 1989 active attraction of terns and plovers to Herding Island was discontinued due to repeated problems with predators and local residents. Habitat management began on Interstate Island in 1984 and has continued to present. All live and dead vegetation was removed in 1989 and portions of the island were rip-rapped to prevent erosion. Herbicides were applied to the center of the island in 1990 to control vegetative growth. In 1987 an eight acre portion of Wisconsin Point was acquired; Barkers Island was dropped from the management program due to failure of terns and plovers to use the island.

Another focus of the program has included activities to discourage the use of highly disturbed sites and encourage use of prepared sites

by Common Terns. Tern decoys and sound systems with recorded tern vocalizations were placed at each management site beginning in 1983 (Herding and Barkers Islands), and at Interstate Island in 1985 and Wisconsin Point in 1987. Intensive discouragement activities at highly disturbed sites began in 1985.

The 1990 program included all of the traditional management areas in the St. Louis River Estuary and the Ashland Pier site in Ashland, Wisconsin. Plans to continue work in the Shipwreck Islands, Lake Kabetogama, St. Louis County, MN, were discontinued when the terns failed to return in 1990. An intensive Ring-billed Gull control program was initiated at Interstate Island in an attempt to prevent the invasion of gulls into the tern management area.

OBJECTIVES

The specific goals for the 1990 season were:

1. To coordinate program activities between the MDNR, WDNR, local government, Port Terminal Staff, U.S. Army Corps of Engineers, U.S. Coast Guard, U.S. Fish and Wildlife Service, and local interest groups and citizens.
2. To assist the MDNR and WDNR in implementing plans for the Interstate Island, and Wisconsin Point management areas.
 - a. To provide recommendations to the MDNR and WDNR regarding on-site vegetation management.
 - b. To attract breeding Common Terns and Piping Plovers to the management areas.
 - c. To discourage breeding by Ring-billed Gulls on the management areas.
 - d. To advise the MDNR and WDNR of need for predator control on the management areas and to assist in efforts to remove problem animals.
3. To discourage Common Tern use of traditional nesting sites that are highly disturbed and/or developed and where chance of breeding success is quite low (e.g., Port Terminal, Erie Pier, Sky Harbor Airport).

4. To census the Common Tern, Piping Plover and Ring-billed Gull nesting populations in the St. Louis River Estuary, and at Ashland Pier, and the Shipwreck Islands.
5. To estimate hatching and fledging success of Common Terns in the estuary and at Ashland Pier.

METHODS

The methods used in 1990 were essentially those used in previous years (Penning 1988,1990) with exceptions detailed below.

Discouragement Activities

In addition to previously described discouragement activities, a Ring-billed Gull control program was initiated on Interstate Island in 1990. Approximately once each week from 1 May through late June, all gull eggs on Interstate Island were collected and nests destroyed. Eggs were placed in buckets and nests were destroyed by kicking at them until the nest cup was broken apart and nest materials were scattered. The eggs were buried on the island; this kept them from the public eye and avoided the odor problem caused by smashing the eggs in the nest.

In early May Bird Scaring Reflective Tape (BSRT) was strung out on the eastern spit of Interstate Island but its use was discontinued when the gulls began to move into the interior of the island.

In an attempt to prevent terns from nesting at the Port Terminal, Erie Pier, and Sky Harbor monitoring was conducted at these areas in the morning and evening.

Predator Control

Encouragement activities were not conducted at Wisconsin Point in 1990 and as a result both trapping and the use of electric fences were discontinued.

The MDNR and WDNR obtained permits to shoot Great Horned Owls from areas where problem owls lived in the past (e.g. Wisconsin and Minnesota Points and Ashland Pier). Surveys for Great Horned Owls

were conducted in late winter (except at Ashland). However, no owls were located.

Attraction Activities

Attraction activities were carried out as in previous years. Common Tern decoys and a solar activated tern call sound system were installed on Interstate Island on 10 May. The decoys were left in place the entire season while the sound system was removed in late May. See Davis (1984) for details on the operation of this system.

Nest Boxes

The use of tern nesting boxes was discontinued at Wisconsin Point. Due to the failure of the terns to return to the Shipwreck Islands the repetition of the nest box/cage top experiment of last year (Penning 1990) was not carried out.

Censuses

Ring-billed Gull nesting colonies were censused using direct nest counts (Pettingill 1985). On 31 May the Port Terminal, Erie Pier Dredge Disposal Site, Minnesota Power Hibbard Plant and associated North and South Islets in Duluth and the Peavey Globe Elevator in Superior were censused (Fig. 1C-H respectively). On 1 June Interstate Island was censused (Fig. 1A). Direct nest counts also were used at all tern nesting sites during peak incubation. For the fifth year no Piping Plovers nested in the estuary, therefore no census was conducted. However, 2 Piping Plovers were seen on Park Point during the spring migration.

Banding

Chicks were banded with U.S.F.W.S. #2 aluminum bands on the left leg at Interstate Island, and the right leg at the Ashland Pier. Color bands were not used this year.

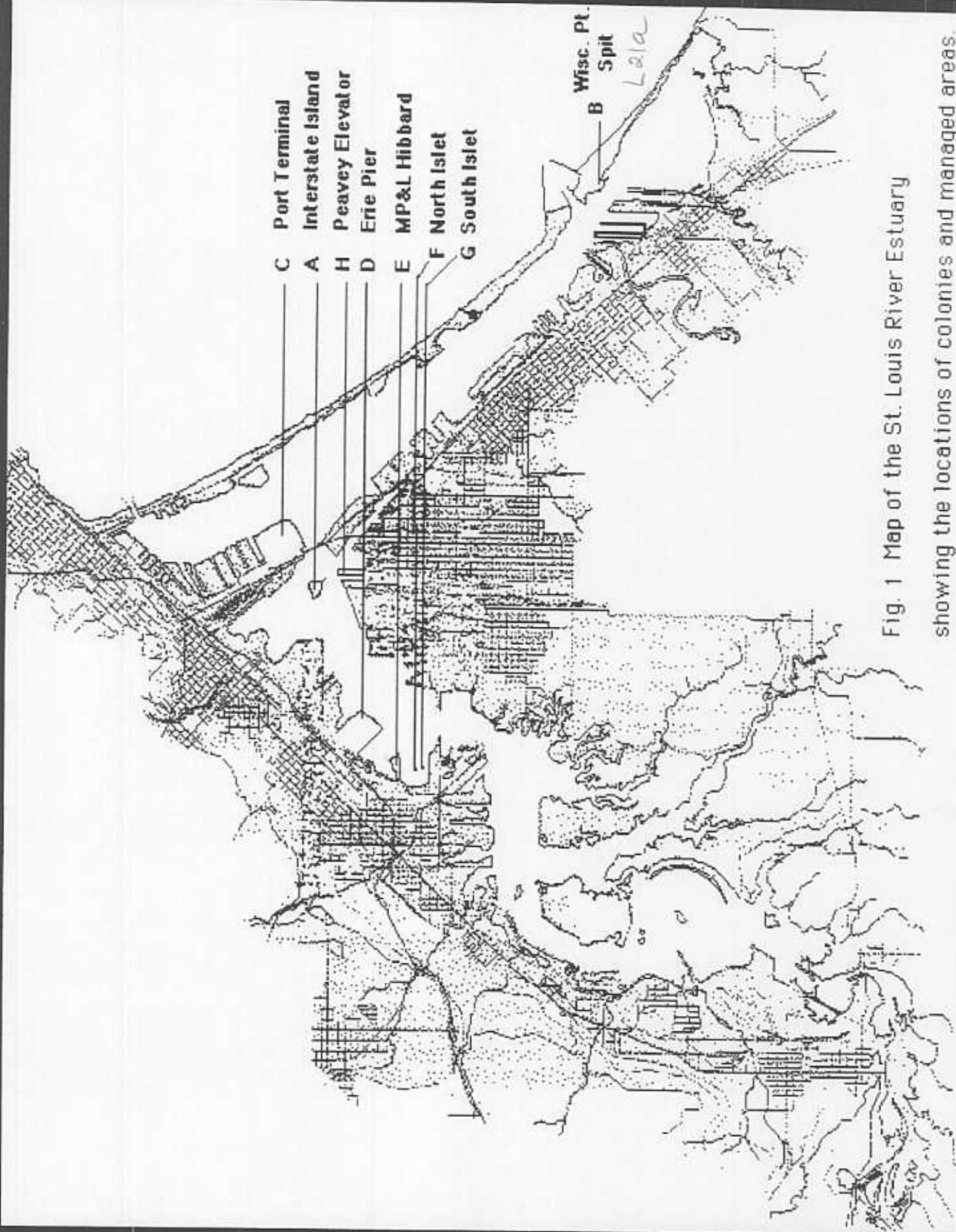


Fig. 1 Map of the St. Louis River Estuary

showing the locations of colonies and managed areas.

Estimating Breeding Success

Throughout the nesting season all potential tern and plover sites were visited at least once a week. An attempt was made to visit all active sites every four days to record the contents of the nests and to band chicks until the last chick fledged. Numbered tongue depressors were used to mark each nest.

Reproductive success, defined by McKearnan and Cuthbert (1989) as the number of young fledged/breeding pair, was calculated by dividing the estimated number of fledglings by the maximum number of active nests. The number of active nests was determined by subtracting the number of inactive nests from the total number of nests on any given date. Each colony was censused every 4-7 days during May. Chicks were considered fledged at the age of 15 days (class 4A) unless they were found dead on a later visit. Fledging success, the proportion of total eggs laid that survived to fledging (McKearnan and Cuthbert 1989), the percent of chicks hatched from the total number of eggs sampled, and percent of chicks fledged from the total number of eggs hatched also were calculated.

RESULTS AND DISCUSSION

For the first time since 1985 there were more than 100 breeding pairs of Common Terns in the estuary. Furthermore, there were more Common Tern chicks fledged in 1990 than has ever been documented in the estuary. Unfortunately, a suspected disease killed many tern chicks at the Ashland Pier and caused poor reproductive success at this site for the second consecutive year.

Discouragement Activities

Ring-billed Gull

The summer of 1990 marks the first year that Ring-billed Gulls failed to nest at the Duluth Port Terminal since nesting was first recorded at this site in 1974 (Davis and Niemi 1980). This was also the first year that large numbers of gulls attempted to nest at Interstate Island. The Interstate Island gull nest removal program produced the destruction of 4324 nests containing 6984 eggs during 10 visits over a period of 9 weeks. The peak number of nests was

818 on 10 May (Table 1). By 27 June the gulls had stopped attempting to nest on the island. Several nests were never discovered, and approximately 5 Ring-billed Gull chicks hatched and presumably fledged from the island. Because of the close proximity of Interstate Island to the Peavey gull colony site yearly nesting attempts by gulls on the island are almost certain to occur. Although there probably is still room for expansion at the Peavey site, continued gull population growth may use all available habitat at this site forcing the colony to expand into new areas. We must anticipate these problems and be prepared to deal with them on a large scale and yearly basis if necessary.

Common Tern

For the first time since intensive tern discouragement activities began in 1985 it was not necessary to spend much time scaring terns away from undesirable sites. BSRT, owl decoys and chasing were not used at any sites. In 1990 the terns did not attempt courtship activities at Erie Pier, the Port Terminal, Sky Harbor, or Wisconsin Point. Instead, upon arrival in Duluth-Superior the terns

Table 1. Summary of Ring-billed Gull nest removal on Interstate 617
Island 1990.

<u>Date</u>	<u># of nests</u>	<u># of eggs</u>
05/02	273	328
05/10	818	1451
05/11	45	89
05/18	795	1410
05/27	475	844
06/01	572	779
06/06	526	763
06/18	609	998
06/23	166	248
06/27	45	74
Total	4324	6984

returned to Interstate Island and began nesting. Interstate was used as the primary roosting site and Herding Island was a loafing area for some of the birds. This is in contrast to previous years when the terns invested much time and energy in attempts to nest at the Port Terminal, Sky Harbor and Wisconsin Point.

Predator Control

Great Horned Owl

Great Horned Owls were not a problem at any of the colonies in 1990. One was seen at Park Point on 16 May. Intensive searches and evening vigils on Interstate Island after the initial observation failed to relocate the bird.

Attraction Activities

Decoys and a sound system were installed on Interstate Island on 10 May. The sound system was removed in early June after the terns began to nest. The decoys were removed at the end of the season.

Censuses

During 1990, the study species nested at five locations in the St. Louis River estuary: the Minnesota Power Hibbard Plant and the associated North and South Islets, the Peavey Globe Elevator and Interstate Island. The first four locations were occupied exclusively by gulls, and the last one, by both gulls and terns. Significant observations include the following: 1) the terns went directly to Interstate and did not attempt to nest at Sky Harbor, Erie Pier, Port Terminal, or Wisconsin Point. It was not necessary to discourage tern use of these areas; 2) Ring-billed Gulls did not attempt to nest at the traditional Port Terminal colony site; 3) for the fifth consecutive year Piping Plovers failed to attempt to nest in the estuary; 4) there were 43 less nests at the peak of nesting at Ashland this year as compared to last year. There were 43 more nests this year at Interstate than recorded last year.

Ring-billed Gull

The Minnesota Power Hibbard Plant, North and South Islets, Erie Pier, Peavey Globe Elevator and the Port Terminal were all censused

on 31 May, 1990. Interstate Island was censused on 1 June, 1990. There were 4730 breeding pairs of Ring-billed Gulls at the Peavey site, this was the second consecutive year that this was the largest colony in the estuary (Table 2, Fig. 2). North Islet had 850 pairs and South Islet had 677 pairs. These two colonies along with the Peavey colony were all larger than in 1989 which was the first year that any of these sites were used. The Hibbard colony (1395 breeding pairs) was smaller than last year. On the date of the census there were 572 breeding pairs of gulls on Interstate Island. This number was down from the 818 breeding pairs of 10 May. It should be noted however that there was an active gull discouragement program on Interstate, that virtually all gull nests on the island were destroyed and that hatching and fledging success of gulls was extremely low. In contrast to 1989 there were no nesting attempts by gulls at either Erie Pier or the Port Terminal.

Piping Plover

For the fifth consecutive spring there were no Piping Plovers nesting in the estuary (Table 3, Fig. 3). There were, however, two Piping Plover sightings on Park Point this spring. The first was on 15 May; the second on 19 May. Both of these birds were not banded.

Common Tern

Because Wisconsin Point is not suitable as a colony site in its present condition, attraction activities were not carried out at Wisconsin Point in 1990. Plans are underway to build a crib structure at Wisconsin Point similar to the one at the Ashland Pier. (For a discussion on why Wisconsin Point is not currently suitable as a colony site and for recommendations for a solution see Penning 1990.)

For the first time since 1985 the population of Common Terns in 1990 in the estuary was greater than 100 breeding pairs. There were 124 breeding pairs of terns in the estuary in 1990, all of them at Interstate Island (Table 4, Fig. 4). The additional 43 pairs of terns at Interstate were probably immigrants from the Ashland Pier colony. The Ashland Pier had 43 fewer breeding pairs of terns in 1990 than in 1989 (Table 5). It is interesting to note that Davis (1983) believed there was a loss of breeding terns from the St. Louis River Estuary to the Ashland Pier in 1983.

At least 168 Common Tern chicks fledged from Interstate Island this year (Table 5). We banded 286 chicks and at least 58.7% of them fledged. This number may have been much higher. Of the 286 chicks hatched on the island in 1990 only 4 were found dead. This leaves 168 fledged and 114 unaccounted for. There were no signs of predation or disease on the island and most of these remaining chicks probably fledged. Assuming that these 114 chicks fledged there would have been 282 chicks fledged (98.6% of the total banded). However, because this was not confirmed, these 114 chicks were not included in the calculations in Table 5. Regardless this is the highest documented number of chicks fledged in the estuary since this program began. Reproductive success (1.35 chicks/ pair) was also the highest ever recorded for this site.

Cross billed chicks were found on 28 June at Ashland and 20 July at Interstate. Both of these chicks were collected and will eventually be analyzed for chemical contamination.

Ashland Pier

Over 300 chicks (322) hatched at Ashland this year. Unfortunately a suspected disease killed 158 chicks between 9 July and 20 July. Sarah Hurley, Wildlife Health Specialist for WDNR, collected and necropsied one chick. Hemorrhages on the heart indicate that a viral infection may have been the cause of the die off. However, the National Wildlife Health Center was unable to find the cause of death upon examination of the carcass and blood samples.

As a result of the die off only 90 (28.0% of the total hatched) chicks were fledged from this site and reproductive success was .70 chicks per pair (Table 5).

One chick was found decapitated on 14 July the same day that the die off was discovered. It is not known whether the decapitation was due to predation, scavenging, or some other cause. No other decapitated chicks were ever found.

Table 2. Number of breeding pairs of Ring-billed Gulls in the St. Louis River Estuary, 1983-1990.

	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>1990</u>
Mn Power Hibbard	751	762	740	392	n/d*	639	1820	1395
South Islet	0	0	0	0	n/d	0	687	677
North Islet	0	0	0	0	n/d	0	570	850
Port Terminal	5608	7103	7015	7969	n/d	6828	942	0
Erie Pier	0	0	0	0	n/d	0	207	0
Peavey Globe Elevator	0	0	0	0	n/d	0	3830	4730
Interstate Island	0	0	0	0	n/d	0	0	572
Total	6359	7865	7755	8361	n/d	7467	8056	8224

* "n/d" means no data

Table 3. Number of nesting pairs of Piping Plovers in the St. Louis River Estuary, 1983-1990.

	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>1990</u>
Sky Harbor	0	0	1	0	0	0	0	0
Port Terminal	3	2	1	0	0	0	0	0
Erie Pier	2	2	1	0	0	0	0	0
Total	5	4	3	0	0	0	0	0

Table 4. Number of pairs of breeding Common Terns in the St. Louis River Estuary, 1983-1990

	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>1990</u>
Sky Harbor	29	29	79	33	0	0	0	0
Port Terminal	122	113	2	4	30	0	0	0
Erie Pier	24	4	1	0	0	0	0	0
Grassy Point Islets	22	0	0	0	0	0	0	0
Wisconsin Point	n/d	15	0	0	57	80	0	0
Interstate Island	0	0	50	0	0	0	81	124
Herding Island	1	0	8	31	0	8	0	0
Total	198	161	140	68	87	88	81	124

Table 5. Common Tern hatching success, chick survival and breeding success at Interstate Island and at Ashland, WI in 1990

<u>Colony Site</u>	<u>% Hatched (number of eggs sampled)</u>	<u>% Fledged (chicks hatched)</u>	<u>Number Fledged</u>	<u>Fledging Success (%)</u>	<u># Pairs</u>	<u>Repro. Success (fledglings /pair)</u>
Interstate Is	81(352)	59(286)	168	48	124	1.35
Ashland, WI	91(353)	28(322)	90	26	129	0.70

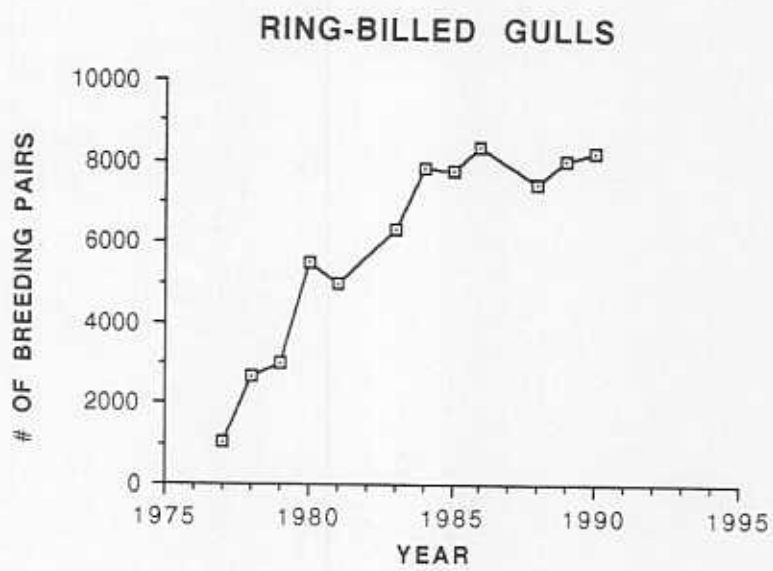


Fig. 2. Number of pairs of Ring-billed Gulls breeding in the St. Louis River Estuary from 1977 to 1990.

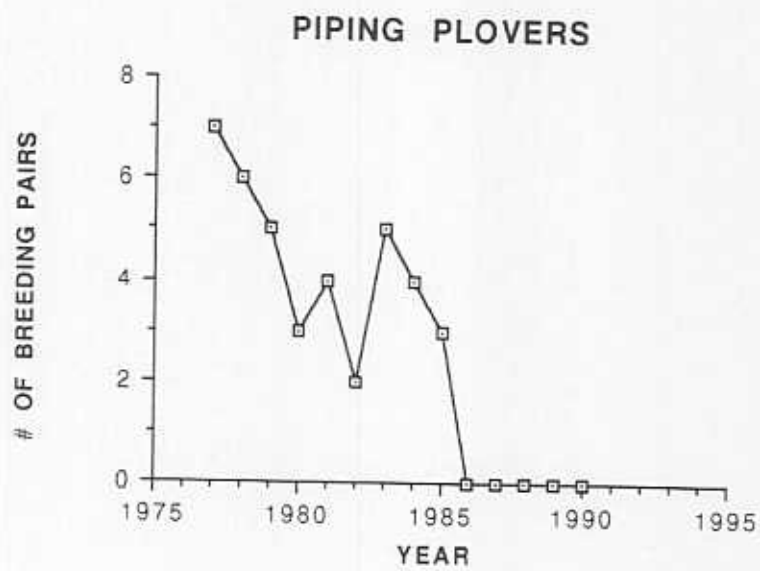


Fig. 3. Number of pairs of Piping Plovers breeding in the St. Louis River Estuary from 1977 to 1990.

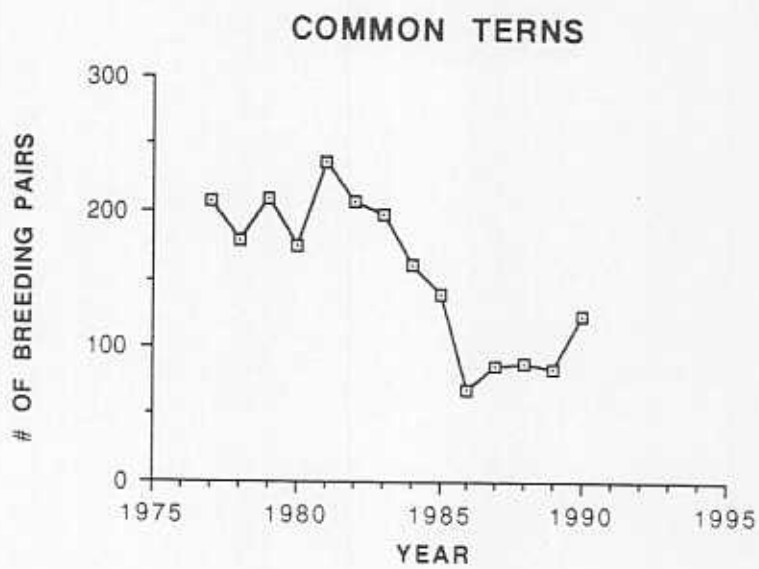


Fig. 4. Number of pairs of Common Terns breeding in the St. Louis River Estuary from 1977 to 1990.

Management Recommendations

1. Censuses: Continue using present methods.
2. Attraction Program: Continue using current methods.
3. Discouragement Activities: Intensive tern discouragement activities may not be necessary in the future. However morning and evening monitoring should continue and personnel must be ready to rapidly begin discouragement activities when needed.
4. Liaison: As in the past.
5. Public Relations: A diversity of methods for obtaining positive support for this program should be considered, including seeking the support of the local interest groups, citizens and media.
6. Predation: Early removal of Great Horned Owls should continue. Investigators and supporting agencies should be prepared to respond to negative criticism and mediate.
7. Gull Control: All desirable nesting areas for Common Terns need to be carefully monitored for the invasion of nesting gulls. Strategies to protect large areas (e.g. Interstate Island) from this threat need to be developed. Permits for both Ring-billed and Herring gull control need to be obtained prior to the breeding season.
8. Interstate Island: A strategy for the yearly management of vegetation on the island needs to be developed. One possible solution is to use a herbicide such as Spike on the interior of the island in the spring and manually manipulate the perimeter vegetation in the fall. This would leave open sand for nesting in the interior surrounded by heavy cover which the terns could use for protection from weather extremes and predators. No trespassing signs should be posted.

9. Wisconsin Point: Without major modification this site is unsuitable for nesting terns. Wisconsin Point is undergoing rapid erosion and Common Tern nests have been repeatedly destroyed by storms during the last 3 years. We recommend building a large crib of railroad ties which is filled with sand like the Ashland Pier colony site. A structure of this type would prevent washouts and minimize human disturbance and access by mammalian predators. Secure nesting habitat could be achieved by building the structure high and using sheet metal baffling and electric fences in combination with signs posting the area to trespass. We recommend that attraction activities at this site cease until this type of structure can be created.
10. Enrichment/Creation Of Islands: Emphasis should be placed on the enrichment of Interstate Island. The development of the Maintenance Dredge Disposal Plan for the Duluth-Superior Harbor should be followed carefully and the planners should be encouraged to consider wildlife needs in the planning process.
11. Ashland Pier: The mesh fence on the perimeter of the Pier needs to be repaired or replaced. A smaller mesh size would help prevent injury to small chicks. More sand needs to be deposited at the site to replace that lost to erosion. It may be beneficial to provide shelter for tern chicks in the form of an 18" square board with an 'X' constructed of 1"x 4" boards fastened to the bottom. Several of these scattered through out the colony would provide shelter for chicks in bad weather (too hot, too cold, heavy rains), during owl attacks, and in times of nocturnal desertion of the colony by the adults.

REFERENCES

- Davis, T. E. 1982a. Proposed management Plan - Interstate Island. Unpublished report.
- _____. 1982b. Proposed Management Plan for the Herding Island Wildlife Management Area. Report to the Minnesota Department of Natural Resources. St. Paul, Minnesota. 59pp. and appendices.
- _____. 1983. St. Louis River Estuary Colonial Bird Program. 1983. Report to the Minnesota Department of Natural Resources. St. Paul, Minnesota. 30pp.
- _____. 1984. St. Louis River Estuary Colonial Bird Program. 1984. Report to the Minnesota Department of Natural Resources. St. Paul, Minnesota. 21pp. and appendices.
- _____. 1985. St. Louis River Estuary Colonial Bird Program. 1985. Report to the Minnesota Department of Natural Resources. St. Paul, Minnesota. 20pp.
- _____. 1986. St. Louis River Estuary Colonial Bird Program. 1986. Report to the Minnesota Department of Natural Resources. St. Paul, Minnesota. 16pp.
- _____. 1987. St. Louis River Estuary Colonial Bird Program. 1987. Report to the Minnesota Department of Natural Resources. St. Paul, Minnesota. 16pp.
- Davis, T. E., and G. J. Niemi. 1980. Larid breeding populations in the western tip of Lake Superior. Loon 52:3-14.
- Duluth-Superior Metropolitan Interstate Committee. 1988. Maintenance Dredge Disposal Plan for the Duluth-Superior Harbor. Internal Draft. 25pp.
- Janssen, R. B. 1987. Birds in Minnesota. University of Minnesota Press. Minneapolis. 352pp.

- McKearnan, J. E., and F. J. Cuthbert. 1989. Status and Breeding Success of Common Terns in Minnesota. *Colonial Waterbirds* 12:185-190.
- Metropolitan Interstate Committee. 1978. Land Use and Management Plan for the Duluth-Superior Harbor. 82 pp. and appendices.
- Penning, W. L., and F. J. Cuthbert. 1988. St. Louis River Colonial Bird Program. 1988. Report to the Minnesota Department of Natural Resources. St. Paul, Minnesota. 12pp.
- Penning, W. L., and F. J. Cuthbert. 1990. St. Louis River Colonial Bird Program. 1989. Report to the Minnesota Department of Natural Resources. St. Paul, Minnesota. 32pp.
- Pettingill, O.S. 1985. *Ornithology in Laboratory and Field*. Academic Press, Orlando.