

UNITED STATES FISH AND WILDLIFE SERVICE

ENVIRONMENTAL ACTION MEMORANDUM


(REGION 3)

Within the spirit and intent of the Council on Environmental Quality's regulations for implementing the National Environmental Policy Act (NEPA) and other statutes, orders, and policies that protect fish and wildlife resources, I have established the following administrative record and have determined that the action of (describe):

conducting two studies to investigate predator management techniques, including lethal predator removal methods, designed to increase duck production on selected islands of the Upper Mississippi River National Wildlife and Fish Refuge.

- is a categorical exclusion as provided by 516 DM 6 Appendix 1. No further documentation will be made (see instructions on back).
- XX - is found not to have significant environmental effects as determined by the attached Environmental Assessment and Finding of No Significant Impact.
- is found to have special environmental conditions as described in the attached Environmental Assessment. The attached Finding of No Significant Impact will not be final nor any actions taken pending a 30-day period for public review (40 CFR 1501.4(e)(2)).
- is found to have significant effects, and therefore a "Notice of Intent" will be published in the Federal Register to prepare an Environmental Impact Statement before the project is considered further.
- is denied because of environmental damage, Service policy, or mandate.
- is an emergency situation. Only those actions necessary to control the immediate impacts of the emergency will be taken. Other related actions remain subject to NEPA review.

Other supporting documents (list):

 3/28/91  
Regional Director Date

(1) Eric C. Nelson 3/22/91  
Initiator Date

(2)  3-25-91  
RHPO Date

(3)  3/28/91  
\*\*Wildlife Associate Manager Date

(4) Lynn M. Lewis 3-27-91  
REC Date

(5) John R. Eadie 3/28/91  
ARD Date

(6) John A. Blumens 3/28/91  
AH Date

\*As delegated by 4 AM 4.1 Director Order No. 5

\*\*For Special Review (see Instructions)

## FINDING OF NO SIGNIFICANT IMPACT

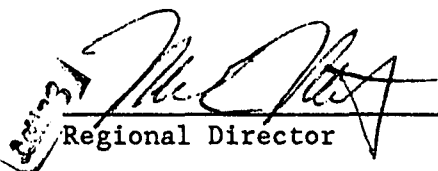
For the reasons presented below and based on an evaluation of the information contained in the supporting references, I have determined that the two experimental lethal predator removal studies investigating several predator management techniques on the Upper Mississippi River National Wildlife and Fish Refuge is not a major Federal action that would significantly affect the quality of the human environment within the meaning of Section 102(2)(c) of the National Environmental Policy Act of 1969. An Environmental Impact Statement will, accordingly, not be prepared.

### Reasons

Predator removal performed to accomplish these studies will have minimal effect on predator species populations, with the removal of 20-30 animals each year for two years in Pool 13 and the removal of 45 animals over a 10-year period in Pool 8. Furthermore, predator removal would have no effect on endangered or threatened species and their habitat, not effect on significant cultural resources, nor any other adverse environmental effect.

### Supporting References

1. Environmental Assessment

  
Regional Director

3/28/91  
Date

Distribution: AE (Master File)  
EHC/BFA--Washington, DC  
SS  
UMR through WAM1

U.S. FISH & WILDLIFE SERVICE  
Department of the Interior

Environmental Assessment  
for  
Studies Investigating Predator Management Techniques  
Designed to Increase  
Duck Production on Selected Refuge Islands,  
Clinton County, IA; Carroll County, IL and  
Vernon County, WI

Upper Mississippi River National Wildlife and Fish Refuge

Regional Director  
Region 3, U.S. Fish and Wildlife Service  
Federal Building, Fort Snelling  
Twin Cities, Minnesota 55111  
Telephone: (612)725-3563

The U.S. Fish and Wildlife Service, Upper Mississippi River National Wildlife and Fish Refuge (Refuge), is proposing to conduct two experimental studies investigating several predator management techniques designed to increase waterfowl nesting success and recruitment on Refuge islands. One study, to be conducted on Navigation Pool 13 (IA and IL), will: 1) monitor nest success on islands with and without predator removal, 2) determine cost effectiveness of predator removal techniques specific to the Refuge, and 3) analyze optimal island habitat for nesting ducks. The second study will: 1) monitor long-term, local duck population responses on 5 predator-free islands in Navigation Pool 8 (WI), and 2) maintain high mallard production on islands to assist collateral recruitment studies. These studies will occur on approximately 25 islands during April 1 through July 15 each year, commencing in 1991. Alternatives considered were: 1) conduct no predator removal studies--the no action alternative, 2) conduct studies using lethal seasonal predator removal techniques--the preferred method, and 3) conduct studies using a combination of lethal and non-lethal removal techniques.

For further information contact Eric Nelson, Refuge Biologist,  
Telephone (507)452-4232.

## Chapter 1: Purpose of and Need for Action

### 1.1 Background / Information

The Upper Mississippi River National Wildlife and Fish Refuge (Refuge) is proposing to conduct two studies investigating several aspects of predator management designed to increase waterfowl nesting success on 5 Refuge islands in Pool 8 and approximately 20 islands in Pool 13.

The Upper Mississippi River System (UMRS) provides essential habitat for a wide variety of plants, fish, migratory birds, and other animals. The river's importance to fish and wildlife is increasing due to continued losses of adequate habitat throughout the midwest. Recently, UMRS was identified in the North American Waterfowl Management Plan as one of 34 areas of major waterfowl concern and is included in the Upper Mississippi River and Great Lakes Region Joint Venture Area. Long recognized as a vital continental migration corridor, the UMRS can provide an increased role in contributing directly to the continental waterfowl breeding population. Study results will be used in conjunction with other investigations to determine feasibility of future operational predator management efforts on selected Refuge islands. In addition, investigators will provide recommendations on island management and construction of new islands.

Waterfowl production estimates on the Refuge (based on unpublished refuge data cited in the Master Plan) for the period 1977-87 range from 4,675 to 14,950 (average 9,700). The annual mallard production objective for the Refuge is 15,000 to 20,000 young. Candidate strategies, identified in the Master Plan, to meet these objectives include: 1) preservation and improvement of habitat through wetland protection and restoration, improved water management, and improved riverine habitat, and 2) increased duck production through seasonal predator management (emphasis added) and improved agricultural practices on private and public lands to enhance nesting cover.

Monitoring of duck nest success on Refuge islands in Pools 8, 12, and 13 during the period 1981 to 1990 has shown that high duck nesting densities and success occur on small islands free of fox (Vulpes vulpes) and raccoon (Procyon lotor), located within open water areas above locks and dams in the lower third of the navigation pools. It has been suggested that the open water and great distance from shore provide a natural predator barrier to the islands. However, individual predators (ie. fox or raccoon) are occasionally stranded on the islands during ice-out or flood conditions, or are able to swim to islands during open water conditions, thus, destroying nests and halting further duck nesting attempts.

Nesting densities on scattered islands studied during the period 1988-90 ranged as high as 200 nests/acre (Wetzel, et al, 1989); these are among the highest figures reported in the literature. Duebbert et al, (1983) found up to 216 nests/ac on an island in Miller Lake, North Dakota. Wetzel also found 26.5 nests hatched/acre under predator-free conditions versus 0.3 nests hatched/acre where fox and raccoon were present; predator-free islands had 88

times as many hatched nests/acre. No predators were removed from any of the islands during this study: predator-free situations were observed under natural circumstances.

In conclusion, it has been demonstrated that small, isolated Refuge islands free of mammalian predators provide optimal mallard nesting habitat, supporting high nest densities with excellent hatching success (Wetzel, et. al. 1989). Predator control efforts on select islands of the Refuge could drastically change both nesting success and subsequent nesting numbers. The subject predator removal studies will provide managers needed information on cost-effectiveness of selected control methods, document local duck population responses to predator free conditions, and provide management recommendations for existing and newly-constructed islands.

## 1.2 Decisions That Need to be Made

The Regional Director, U.S. Fish and Wildlife Service, Twin Cities, MN, needs to make two decisions: 1) select an alternative and 2) determine if the project is a major Federal action having a significant effect on the environment requiring preparation of an Environmental Impact Statement.

## 1.3 Issues and Concerns

Previous Environmental Assessments for predator removal efforts to enhance waterfowl nesting success have shown that both public agencies and private interests have concerns. A segment of the public is opposed to trapping and/or removal of predators, others are concerned about incidental mortality of non-target species, others are concerned about the effects on furbearer populations and harvest regulations. Public and private interests also are interested in reversing declining duck populations, addressing unnaturally heavy predation losses of upland nesting birds, filling a need to monitor effectiveness of predator reduction over time, and considering cost-effectiveness of predator removal activities.

No additional issues and concerns were received from 13 conservation, humane, and sporting organizations who were provided a draft of this EA. None of the organizations submitted comments as of the end of the 30-day public comment period, ending March 20, 1991 (See Chapter 2.2 and Chapter 6).

## 1.4 Permits, Licenses, and other Compliances Required

### 1.4.1 Endangered species

No federal or state listed endangered species or habitat will be affected by these studies. The bald eagle (Haliaeetus leucocephalus), a federally listed threatened species in MN and WI, and an endangered species in IA and IL, is present on the Refuge year round, having wintering, breeding and migrating populations. The peregrine falcon (Falco peregrinus) is present during spring and fall migration and historically nested along river bluffs in MN, IA, and WI.

To eliminate the possibility of inadvertent capture, all leg-hold and cubby/conibear traps will be placed in concealed locations, inaccessible to eagles and other raptors.

The endangered mussel, Higgin's pearly-eye mussel (Lampsilis higginsii) is present on the river bottom and will not be affected by these studies.

#### 1.4.2 Historic Preservation

Predator management involves no new ground disturbance nor alteration to structures. Trenches dug for burial of carcasses will be located on previously disturbed sites, particularly in a borrow pit area or a dredge disposal site on the Refuge. Therefore, the Regional Historic Preservation Office has determined that no archeological, architectural, engineering, or historical resources on or eligible for the National Register of Historic Places would be affected by these studies.

#### 1.4.3 Permits

Implementation of the predator management studies is pending receipt of letters of authorization/concurrence from the Wisconsin Department of Natural Resources, the Illinois Department of Conservation, and the Iowa Department of Natural Resources. All three states are preparing such documents as of March 21, 1991.

Refuge and Mississippi Cooperative Fish and Wildlife Research Unit personnel will be directly involved in the predator removal portions of the study on Pool 13. Therefore, Iowa has issued a scientific collector's permit (dated March 6, 1991) to the Refuge, with an amendment to include all personnel involved. Illinois has indicated a scientific permit will be issued to investigators upon receipt of appropriate applications, submitted March 19, 1991. In Wisconsin, actual predator removal activities on the Pool 8 study will be conducted by Wisconsin personnel only, therefore, no permit will need to be issued to the Refuge. Local conservation officers will be notified of the studies in progress and kept current on the predator removal activities.

### Chapter 2: Alternatives Including Proposed Action

#### 2.1 Introduction

This Chapter will describe how various alternatives were developed, which alternatives were selected or dropped from the assessment, provide details of alternatives weighed in the assessment, compare the alternatives, and finally identify the preferred alternative.

#### 2.2 Process Used to Formulate Alternatives

Refuge staff, Region 3 biologists, the Mississippi Cooperative Fish and Wildlife Research Unit Leader, and Wisconsin Department of Natural Resources biologists have developed the study proposals. A draft of this Environmental Assessment was provided to each State conservation agency and additional copies were circulated for public review (responses due March 20, 1991) to one

national organization and 12 local organizations and chapters located near the study Pools. A list of these contacts appears in Chapter 6.

The 30-day comment period for the EA ended March 20, 1991.

As of March 21, 1991, the Refuge received comments from wildlife and law enforcement personnel in the 3 State conservation agencies, all endorsing the studies. The Refuge had not received any comments from the other 13 organizations and groups who were provided the EA, reasons unknown.

Iowa provided valuable comments on study design, permit requirements, and concerns about taking non-target species, such as the otter (Lutra canadensis). Trapping will be avoided in known areas of high otter activity. Iowa conservation officers will be notified immediately if otter are inadvertently taken during the study. Iowa issued a scientific collectors permit to the refuge biologist, as of March 6, 1991, and is amended to include all personnel directly involved in the predator removal activities.

Illinois supports the Pool 13 study and the State office is processing scientific collection permits for individuals from the Refuge and Mississippi State University and Cooperative Wildlife Research Unit.

Wisconsin provided comments on the Pool 8 study concerning design and permit requirements; they are incorporated in the final EA. As noted above, State personnel only will be conducting predator removal activities, therefore, no permit is needed for the Refuge.

## 2.3 Alternatives Eliminated from Detailed Study

Alternatives eliminated from detailed study include :1) contracting professional trappers to complete the study, and 2) utilizing Refuge personnel only to complete the studies. These were eliminated because refuge funding was insufficient and personnel levels were inadequate to dedicate the full time effort required to complete the study.

## 2.4 Description of Alternatives

### 2.4.1 No Seasonal Predator Removal Studies

This no action alternative would leave unresolved the question that emerged from previous studies as to whether seasonal predator removal on selected islands could enhance Refuge duck production. Previous studies demonstrated that small, isolated predator-free islands supported high duck nest densities under natural conditions in Pools 8 and 13. Results showed that approximately 6.6 acres of 10 predator-free islands on the Refuge produced comparable numbers of successful nests as did 186 acres of electric fence predator exclosures in the prairie pothole region of central and western Minnesota (Dahlgren, 3-yr summary report, 9/5/90). While not depreciating the importance of predator exclosures, these data show potential cost-effectiveness of predator removal on certain islands on the Refuge. Removal of a single predator on an isolated island may result in a predator-free condition throughout the nesting season. Both studies will examine this hypothesis.

#### 2.4.2 Lethal Predator Removal Studies - the Preferred Alternative

The Upper Mississippi River National Wildlife and Fish Refuge (Refuge) is proposing to conduct two studies analyzing predator management techniques designed to increase waterfowl nesting success on Refuge islands. Mammalian predators, primarily fox and raccoon, would be removed from approximately 20 Refuge islands in Pool 13 and 5 islands in Pool 8, using lethal means. Annual predator removal will be conducted from April 1 through July 15, 1991 and 1992 in Pool 13, and during the years 1991 through 1999 on Turtle Island in Pool 8. Study islands in Pool 13 are located between River Miles 526 and 534; in Pool 8 they occur between River Miles 684 and 687.

These experimental predator removal studies will be coordinated by Refuge personnel. On Pool 13, Dr. Ed Hill, Unit Leader, Mississippi Cooperative Fish and Wildlife Research Unit, will supervise the study and predator removal activities conducted by a Cooperative Education graduate student and assisted by a Refuge biological technician stationed at Savanna District. The Pool 8 study will be supervised by John Wetzel, Wisconsin Department of Natural Resources, La Crosse; removal activities will be conducted by Department and Fish and Wildlife Service personnel. No outside contractors will be involved in either study.

The Pool 13 study will compare duck nesting success over a 2 year period on 10 islands with predator removal compared to 10 control islands with no predator removal. It is anticipated that 20-30 animals will be removed from Pool 13 islands each of the 2 years. Predators will be removed using cubby/conibear quick-kill traps (raccoon), foothold traps (fox), or live traps (raccoon and fox). Trapped animals will be destroyed using a 22 cal. rifle. Dead animals will be collected in plastic bags, transported to an upland site on the Refuge, and buried in a trench; some animals may be donated to an agency for further research. Traps will be checked daily. Island reoccupation by other predators will be monitored through continuous trapping operations and field inspections on the study islands. Non-target animals will be released at the trap site. The per island cost of removal will be recorded and analyzed. Total maximum number of predators removed during the Pool 13 study is approximately 60 animals over a 2-year period. This study will also determine optimal island habitat and location within the Pool for achieving successful mallard nesting.

The Wisconsin DNR/USFWS study on Pool 8 will involve removal of predators from Turtle Island, and maintenance of predator-free conditions on 4 small islands near Turtle, to determine mallard population responses to long-term predator-free conditions as well as provide high local mallard populations for collateral studies on duckling survival and recruitment. Previous investigations indicate that 4 of these islands have been free of mammalian predators since 1981. Trapping and disposal techniques on Pool 8 will be the same as those used on Pool 13, described above, with the exception that carcasses may be buried on either State or Refuge lands. It is anticipated that 2 to 4 fox, and 3 to 5 raccoon will initially be removed from Turtle Island; subsequent removals will involve 0 to 3 individuals annually. It should not be necessary to remove more than 1 to 5 individuals from the 4 island group, over the



entire 10-year study period. Total number of predators to be removed during the Pool 8 study is approximately 45 animals.

#### 2.4.3 Studies Utilizing both Lethal and Non-lethal Predator Removal Techniques.

Lethal removal techniques are described in the previous section. Non-lethal predator removal techniques include the use of live-traps and leg-hold traps and the subsequent transport and release of trapped animals. Live-trapped animals will have to be subdued using snare sticks and/or anesthesia, possibly endangering the animal and/or trapper. Animals would then be caged and transported by boat to the upper reaches of the navigation pools, and released. This is time-consuming and expensive, and potentially dangerous to animals and investigators. Occasionally, live-trapped animals injure themselves and must be destroyed rather than released.

#### 2.5 Comparison of Alternatives

Both the preferred alternative (lethal predator removal studies) and the alternative using a combination of lethal and non-lethal means could be utilized to achieve predator-free conditions on most of the islands intended for study. However, live-trapping, transport and release of raccoon, fox and other predators requires more investment of time and money than using cubby/conibear traps and leg-holds. These traps will be placed to avoid capture of non-target species. In addition, live-trap, transport, and release techniques will negatively effect predator/prey populations at release sites on the Refuge, possibly negating increased waterfowl production on islands resulting from the study. Local and regional predator populations will not be adversely effected by the removal of up to 30 animals per year in the Pool 13 area, and 8 animals the first season and 0 to 3 animals in subsequent seasons in the Pool 8 studies.

#### 2.6 Preferred Alternative

The preferred alternative is to conduct the two studies using lethal predator removal methods.

#### 3.0 Affected Environment

The Upper Mississippi River National Wildlife and Fish Refuge is the longest wildlife refuge in the lower 48 states, extending more than 260 miles southward from Reads Landing, Minnesota, to near Rock Island, Illinois; it encompasses about 198,000 acres of Mississippi River bottomlands. Twelve of 27 locks and dams on the entire Upper Mississippi River System are within the Refuge boundaries, forming a series of navigation pools, varying from 10 to 30 miles long designed to maintain a 9-foot navigation channel. The dams artificially raised water levels, creating a maze of channels, sloughs, islands, marshlands, and open lakes over the river bottoms since installation in the 1930s.

Predator removal studies will be conducted on Refuge islands located in the lower to mid-pool areas of Pool 8 and Pool 13. These islands range in size

from 0.5 to 15 acres. Island habitat varies from predominantly grassy to brushy to mature forest. Previous nesting studies of these islands revealed that mallards nested in dense tangles of stinging nettle (Urtica dioica) and poison ivy (Rhus radicans), dense will or brush growth, downed trees (bottomland hardwoods), and even in the root whorls of downed trees in almost den-like situations.

The Mississippi River often floods, on average the peaks last 4-10 days, usually occurring in late April or early May, with occasional flooding in June. It is expected that nests on some islands will be lost to flooding depending on timing of flooding and height above water of islands. Renesting will at least partially compensate for flooding. Mallard nesting studies on 4 islands in Pool 8 show substantial nesting efforts over a 10-year period with variable numbers between islands and between years reflecting variable water conditions and effects of predation.

Past studies have shown that human disturbance has influenced nesting on a few islands that have a stretch of sandy beach (Dahlgren, 1990). Four of 34 islands were disturbed by recreationists, resulting in 30% nest abandonment, 3 times the abandonment of undisturbed islands.

Avian predation on duck nests has accounted for up to 9% of nest losses on islands in earlier studies. These were presumably by gulls (Larus argentatus) and/or crows (Corvus brachyrhynchos). No attempts will be made to remove avian predators during the two proposed studies.

#### 4.0 Environmental Consequences

##### 4.1 No Action Alternative

The consequences of a no-action alternative would mean that mallard nesting on predator-free islands would continue on a limited basis on the Refuge. Predators would continue to occupy islands and inhibit waterfowl production, thus impeding our efforts to determine which predator management methods could feasibly be used to help achieve populations goals established by the Refuge Master Plan and the North American Waterfowl Management Plan (NAWMP). Without the studies, our knowledge of potential impacts of island predator removal on nest success, recruitment, cost-effectiveness, island habitat management, and island construction will be greatly restricted.

The no-action alternative will assure that approximately 115 animals (mainly raccoon) will not be removed and destroyed from approximately 25 islands over the next 10-year period. No action will also allow predators to destroy up to 60 nests on a single island per year, as documented by earlier studies on Pools 8 and 13.

##### 4.2 Alternative 2, the Preferred Alternative

The preferred alternative (studies using lethal predator removal techniques) will result in anticipated removal of up to 115 animals. It is anticipated that 20-30 animals will be removed from Pool 13 islands each of the 2 years of

study; total removed is approximately 40-60 animals. Total number of predators anticipated to be removed during the 10-year study on Pool 8 is approximately 45 animals.

Field observations indicate that the vast majority of predators likely to be removed from the study islands will be raccoon; incidental predators will include fox, mink (Mustela vison), skunk (Mephitis mephitis), opossum (Didelphis virginiana) and, possibly, feral dogs and cats. Dogs and cats with collars will be transported to shore and efforts made to locate the owners; it is illegal to allow unrestrained pets roam the Refuge.

Nesting success on small islands could reach 65-70% with up to 200 nests per acre. These studies will possibly lead to implementation of cost-effective predator management techniques on islands to help the Refuge achieve duck production goals identified in the Refuge Master Plan and the NAWMP.

#### 4.3 Alternative 3

The alternative of implementing studies utilizing both lethal and non-lethal predator removal methods will have similar duck production benefits but at the expense of predator/prey disruptions in the non-study areas of the Refuge, as well as increased safety hazards to the trappers and increased costs.

Non-lethal, capture and release predator removal techniques will present an ecological disadvantage for the Refuge. Not only will local populations be disrupted by the study itself, the transport and release of captured animals will cause a second ecological shift in predator populations somewhere else on the Refuge. Displaced animals would potentially compete with current occupants for food, put more pressure on existing prey populations and disrupt existing social structures, thus widening and compounding the study effects on the Refuge.

## 5.0 List of Preparers

Eric Nelson, Refuge Biologist, UMRNW&FR, Winona, MN (Lead)

### Contributors:

\*\*Dr. Ed Hill, Mississippi Cooperative Fish and Wildlife Unit, Mississippi State University.

\*\*Dr. Robert Dahlgren, Asst. Regional Refuge Biologist, La Crosse, WI

\*\*Larry Wargowsky, Savanna District Manager, UMRNW&FR, Savanna, IL

\*\*Ed DeVries, Refuge Operations Specialist, UMRNW&FR, Savanna, IL

\*\*John Wetzel, Wildlife Biologist, WI DNR, La Crosse, WI.

## 6.0 List of Agencies, Organizations, and Persons to Whom Copies of the Environmental Assessment are Sent.

--Mr. Mark Frech, Director  
Department of Conservation  
Lincoln Tower Plaza  
524 South Second Street  
Springfield, Illinois 62701

--Mr. Larry J. Wilson, Director  
Department of Natural Resources  
Wallace State Office Building  
East 9th and Grand Avenue  
Des Moines, Iowa 50319

--Mr. Steve Miller, Director  
Bureau of Wildlife Management  
Department of Natural Resources, Box 7921  
Madison, Wisconsin 53707

The Defenders of Wildlife  
1244 19th Street N.W.  
Washington, D.C. 20036

Conservation, Humane, Hunting, and Trapping organizations in the vicinity of Pools 8 and 13 were provided draft environmental assessments.

### Pool 13 Groups

Quad City Conservation Alliance, Inc.  
P.O. Box 308  
Moline, IL 61265

Izaak Walton League - Clinton Chapter  
North Bluff  
Clinton, IA 52732

Northwest Illinois Furtakers Association  
Dean Heller  
240 N. Main  
Stockton, IL 61085

Mississippi Sportsmen's Club, Inc.  
Rt 84 North  
Thomson, IL 51285

Ducks Unlimited, River Cities Chapter 169  
501 15th Ave.  
Fulton, IL 61252

Ducks Unlimited of Northwest Illinois  
106 S. Hannan  
Mt. Morris, IL 61054

Pool 8

La Crosse County Conservation Alliance  
Harry Meinking  
P.O. Box 933  
La Crosse, WI 54601

Great River Wildlife Center  
Mike Furr  
P.O. Box 695  
La Crosse, WI. 54602

La Crosse Audubon Society  
Laura Johnson  
Rt. 1 Box 244A  
La Crosse, WI 54601

Gopher State Sportsman Club, Inc.  
J.W. Ramsden, President  
P.O. Box 25  
La Crescent, MN 55947

Vernon County Conservation Alliance  
Mike Shastrad  
Rt 3  
Cashton, WI 54619

Humane Society Coulee Region  
Mary Vinson  
2850 Larson St.  
La Crosse, WI 54601

#### Literature Cited

Duebbert, H.F., J.T. Lokemoen, and D. E. Sharp. 1983. Concentrated nesting of mallards and gadwalls on Miller Lake Island, North Dakota. J. Wildl. Manage. 47(3):729-740.

Dahlgren, R. B. 1990. Island-nesting mallards, 1988-90. A three-year summary report (dated 9/5/90) submitted to Region 3, FWS, Regional Refuge Management Biologist.

Wetzel, J.F., J.S. Nelson, and R. B. Dahlgren. 1989. Survey of waterfowl nesting success on Upper Mississippi River National Wildlife and Fish Refuge Islands and implications for habitat projects. In, Proceedings of the 45 Annual Mtng. of Upper Mississippi River Conservation Committee, Wisconsin Dells, WI March 7-8, 1989. UMRCC, 18 32nd Avenue, Rock Island, IL 61201.



IN REPLY REFER TO:

# United States Department of the Interior

FISH AND WILDLIFE SERVICE

UPPER MISSISSIPPI RIVER NATIONAL WILDLIFE AND FISH REFUGE  
51 E. Fourth Street - Room 101  
Winona, Minnesota 55987



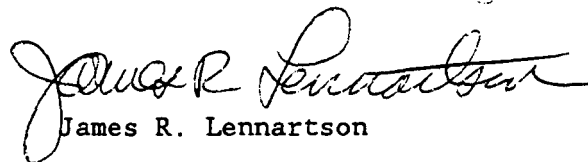
May 3, 1991

## Memorandum

To: Regional Director, FWS, Twin Cities, MN (WAM1)  
From: Refuge Manager, Upper Mississippi River NW & FR, Winona, MN  
Subject: Predator Removal Study--Pool 13

The States of Iowa and Illinois have provided the necessary permits for investigators to use firearms (shotguns only) in order to remove predators from study islands in Pool 13. Investigators have found that shotguns may be the best technique available to remove trap-shy predators, particularly fox.

The attached amendment to the Environmental Assessment is provided to include firearms, along with trapping, as approved techniques for removing predators from study islands. The added technique will not result in a significant increase in the number of animals removed during the study.

  
James R. Lennartson

U.S. FISH AND WILDLIFE SERVICE  
Department of the Interior

Amendment to:

Environmental Assessment  
for  
Studies Investigating Predator Management Techniques  
Designed to Increase  
Duck Production on Selected Refuge Islands  
Clinton County, Iowa; Carrol County, IL; and  
Vernon County, WI

UPPER MISSISSIPPI RIVER NATIONAL WILDLIFE AND FISH REFUGE

Regional Director  
Region 3, U.S. Fish and Wildlife Service  
Federal Building, Fort Snelling  
Twin Cities, Minnesota 55111  
(612)725-3563



On March 28, 1991, the acting Regional Director determined that two predator removal studies were not major Federal actions that would significantly affect the quality of the human environment (Finding of No Significant Impact). The addition of this amendment will not alter the determination.

The purpose of this amendment is to identify an additional technique that investigators may use in order to remove predators from study islands in Navigation Pool 13.

On page 6 of the Environmental Assessment, Item 2.4.2 "Lethal Predator Removal Studies--the Preferred Alternative," paragraph 3, the third sentence is amended to include the use of firearms (shotgun only) as follows:

"Predators will be removed using firearms (shotgun only), cubby/conibear quick-kill traps (raccoon), foothold traps (fox), or live traps (raccoon and fox)."

The addition of the use of firearms as a removal technique will not significantly change the total number of animals removed during the study, therefore, there are no added impacts or consequences to the environment. The firearm technique will, however, provide added efficiency in removing trap-shy predators, particularly fox, from the study islands, thus achieving the desired predator-free conditions on selected islands.

The States of Illinois and Iowa have provided the Fish and Wildlife Service scientific collector's permits to remove predators by the use of traps and firearms during the investigations. Specifically, Illinois has allowed the use of "firearms and traps" (Attachment 1) and Iowa has amended its original permit to allow the permittee to "trap predators (fur-bearers) and use a shotgun to collect fox and raccoon," (Attachment 2).

This amendment submitted on May 3, 1991.

SC 00185 01 00 815 273 2732 0000 03 05 91

**IOWA DEPARTMENT OF NATURAL RESOURCES**

LICENSE NUMBER SC 00185 01 VALID 03/06/91 THRU 01/10/92 FEE\$ 0.00

ISSUED TO

LICENSE TYPE/TAGS/CONDITIONS

U.S. FISH & WILDLIFE SERVICE  
ERIC NELSON  
POST OFFICE BUILDING  
SAVANNA, ILLINOIS 61074

SCIENTIFIC COLLECTOR'S PERMIT  
To trap and remove predators  
(furbearers) to increase duck  
nesting success. Study to be  
conducted on pool 13 of the  
Mississippi River.

NO REFUNDS ON ANY LICENSE SOLD

PERSONS ASSISSTING: Dr. Ed Hill  
Michael Johnson  
Larry Wargowsky  
Ed DeVries  
Matt deRosier  
Deborah Dee

Scientific Permit No. W-9256

Issued 03/25/91 Expires 12/31/91



Authorization is hereby granted, under Section 3.22, Chapter 61 and/or Section 5.18, Chapter 56 of the Illinois Revised Statutes to:

Michael W. Johnson  
400 Gillespie Street, Apt A-4  
Starkville, MS 39759

for strictly scientific, educational, or zoological purposes, to take the Illinois fauna identified below subject to the following provision:

May take by means of firearms and traps, all species defined as fur-bearing mammals by Par. 2.2, Ch. 61, Ill. Rev. Stat., except bobcat and river otter. Specimens must be buried, incinerated, or donated to an appropriate biological or educational institution.  
AUTHORIZATION: all portions of the Upper Mississippi River Refuge that occur within Illinois.

I agree to follow the provisions and terms of this  
Scientific Permit:

Permittee's  
Signature \_\_\_\_\_

(Permit not valid unless signed)

Approved:  
Director, Dept. of Conservation

by: John H. Tranter  
Director, Office of Resource Management

## **TERMS FOR SCIENTIFIC PERMIT**

1. Under no circumstances shall a scientific permit be used in lieu of sport or commercial licenses.
2. All taking shall be performed by or under the direct supervision of the permittee. Permittee must be present with persons involved in actual taking.
3. All gear left unattended must be tagged bearing name and scientific permit number of permittee.
4. Permittee must be at least eighteen (18) years of age.
5. Permits are not transferable and PERMITTEE SHALL CARRY PERMIT AT ALL TIMES WHEN TAKING FAUNA.
6. Agency, Company or Institution listed on the application is responsible for the taking activities and reports of the individual issued this permit.
7. Scientific permits will not be valid for taking any species appearing on official State List of Endangered and Threatened Vertebrate Species of Illinois (see attached Administrative Rule, Part 1010) without specific written approval from the Department of Conservation.
8. A Federal Permit is required for the taking of species protected by the Federal Government in addition to the State Scientific Permit.
9. The Division of Wildlife Resources may require special conditions or provisions on any Scientific Permit.
10. Use of rotenone or any other toxic materials for taking must have special written approval from the Department of Conservation and may need a variance from the Illinois Environmental Protection Agency.
11. By January 31, of next year, an annual report of the permittee's activities must be submitted to the Division of Wildlife Resources. In addition, the permittee shall submit copies (2) of all written reports, including but not limited to: research papers, thesis, progress reports, publications, environmental assessment reports, etc. that result from the permitted activity. Permits will be renewed only after these annual reports and appropriate publications have been received.
12. Any permit may be revoked or suspended at any time by the Department of Conservation.
13. Permits expire December 31 each calendar year, unless otherwise specified.

SC 00185 01 00 815 273 2732 0000 03 05 91

**IOWA DEPARTMENT OF NATURAL RESOURCES**

LICENSE NUMBER SC 00185 01      VALID 03/06/91      THRU 01/10/92      FEE \$ 0.00

**ISSUED TO**

U.S. FISH & WILDLIFE SERVICE  
ERIC NELSON  
POST OFFICE BUILDING  
SAVANNA, ILLINOIS 61074

**LICENSE TYPE/TAGS/CONDITIONS**

SCIENTIFIC COLLECTOR'S PERMIT  
TO TRAP PREDATORS (FUR-BEARERS) & USE A  
SHOTGUN TO COLLECT FOX AND RACCOON; TO  
INCREASE DUCK NESTING SUCCESS. STUDY TO  
BE CONDUCTED ON POOL 13 OF THE  
MISSISSIPPI RIVER.

**NO REFUNDS ON ANY LICENSE SOLD**

U.S. FISH & WILDLIFE SERVICE  
Department of the Interior

Environmental Assessment  
for  
Studies Investigating Predator Management Techniques  
Designed to Increase  
Duck Production on Selected Refuge Islands,  
Clinton County, IA; Carroll County, IL and  
Vernon County, WI

Upper Mississippi River National Wildlife and Fish Refuge

Regional Director  
Region 3, U.S. Fish and Wildlife Service  
Federal Building, Fort Snelling  
Twin Cities, Minnesota 55111  
Telephone: (612)725-3563

The U.S. Fish and Wildlife Service, Upper Mississippi River National Wildlife and Fish Refuge (Refuge), is proposing to conduct two experimental studies investigating several predator management techniques designed to increase waterfowl nesting success and recruitment on Refuge islands. One study, to be conducted on Navigation Pool 13 (IA and IL), will: 1) monitor nest success on islands with and without predator removal, 2) determine cost effectiveness of predator removal techniques specific to the Refuge, and 3) analyze optimal island habitat for nesting ducks. The second study will: 1) monitor long-term, local duck population responses on 5 predator-free islands in Navigation Pool 8 (WI), and 2) maintain high mallard production on islands to assist collateral recruitment studies. These studies will occur on approximately 25 islands during April 1 through July 15 each year, commencing in 1991. Alternatives considered were: 1) conduct no predator removal studies--the no action alternative, 2) conduct studies using lethal seasonal predator removal techniques--the preferred method, and 3) conduct studies using a combination of lethal and non-lethal removal techniques.

For further information contact Eric Nelson, Refuge Biologist,  
Telephone (507)452-4232.

## Chapter 1: Purpose of and Need for Action

### 1.1 Background / Information

The Upper Mississippi River National Wildlife and Fish Refuge (Refuge) is proposing to conduct two studies investigating several aspects of predator management designed to increase waterfowl nesting success on 5 Refuge islands in Pool 8 and approximately 20 islands in Pool 13.

The Upper Mississippi River System (UMRS) provides essential habitat for a wide variety of plants, fish, migratory birds, and other animals. The river's importance to fish and wildlife is increasing due to continued losses of adequate habitat throughout the midwest. Recently, UMRS was identified in the North American Waterfowl Management Plan as one of 34 areas of major waterfowl concern and is included in the Upper Mississippi River and Great Lakes Region Joint Venture Area. Long recognized as a vital continental migration corridor, the UMRS can provide an increased role in contributing directly to the continental waterfowl breeding population. Study results will be used in conjunction with other investigations to determine feasibility of future operational predator management efforts on selected Refuge islands. In addition, investigators will provide recommendations on island management and construction of new islands.

Waterfowl production estimates on the Refuge (based on unpublished refuge data cited in the Master Plan) for the period 1977-87 range from 4,675 to 14,950 (average 9,700). The annual mallard production objective for the Refuge is 15,000 to 20,000 young. Candidate strategies, identified in the Master Plan, to meet these objectives include: 1) preservation and improvement of habitat through wetland protection and restoration, improved water management, and improved riverine habitat, and 2) increased duck production through seasonal predator management (emphasis added) and improved agricultural practices on private and public lands to enhance nesting cover.

Monitoring of duck nest success on Refuge islands in Pools 8, 12, and 13 during the period 1981 to 1990 has shown that high duck nesting densities and success occur on small islands free of fox (Vulpes vulpes) and raccoon (Procyon lotor), located within open water areas above locks and dams in the lower third of the navigation pools. It has been suggested that the open water and great distance from shore provide a natural predator barrier to the islands. However, individual predators (ie. fox or raccoon) are occasionally stranded on the islands during ice-out or flood conditions, or are able to swim to islands during open water conditions, thus, destroying nests and halting further duck nesting attempts.

Nesting densities on scattered islands studied during the period 1988-90 ranged as high as 200 nests/acre (Wetzel, et al, 1989); these are among the highest figures reported in the literature. Duebbert et al, (1983) found up to 216 nests/ac on an island in Miller Lake, North Dakota. Wetzel also found 26.5 nests hatched/acre under predator-free conditions versus 0.3 nests hatched/acre where fox and raccoon were present; predator-free islands had 88



times as many hatched nests/acre. No predators were removed from any of the islands during this study: predator-free situations were observed under natural circumstances.

In conclusion, it has been demonstrated that small, isolated Refuge islands free of mammalian predators provide optimal mallard nesting habitat, supporting high nest densities with excellent hatching success (Wetzel, et. al. 1989). Predator control efforts on select islands of the Refuge could drastically change both nesting success and subsequent nesting numbers. The subject predator removal studies will provide managers needed information on cost-effectiveness of selected control methods, document local duck population responses to predator free conditions, and provide management recommendations for existing and newly-constructed islands.

## 1.2 Decisions That Need to be Made

The Regional Director, U.S. Fish and Wildlife Service, Twin Cities, MN, needs to make two decisions: 1) select an alternative and 2) determine if the project is a major Federal action having a significant effect on the environment requiring preparation of an Environmental Impact Statement.

## 1.3 Issues and Concerns

Previous Environmental Assessments for predator removal efforts to enhance waterfowl nesting success have shown that both public agencies and private interests have concerns. A segment of the public is opposed to trapping and/or removal of predators, others are concerned about incidental mortality of non-target species, others are concerned about the effects on furbearer populations and harvest regulations. Public and private interests also are interested in reversing declining duck populations, addressing unnaturally heavy predation losses of upland nesting birds, filling a need to monitor effectiveness of predator reduction over time, and considering cost-effectiveness of predator removal activities.

No additional issues and concerns were received from 13 conservation, humane, and sporting organizations who were provided a draft of this EA. None of the organizations submitted comments as of the end of the 30-day public comment period, ending March 20, 1991 (See Chapter 2.2 and Chapter 6).

## 1.4 Permits, Licenses, and other Compliances Required

### 1.4.1 Endangered species

No federal or state listed endangered species or habitat will be affected by these studies. The bald eagle (Haliaeetus leucocephalus), a federally listed threatened species in MN and WI, and an endangered species in IA and IL, is present on the Refuge year round, having wintering, breeding and migrating populations. The peregrine falcon (Falco peregrinus) is present during spring and fall migration and historically nested along river bluffs in MN, IA, and WI.

To eliminate the possibility of inadvertent capture, all leg-hold and cubby/conibear traps will be placed in concealed locations, inaccessible to eagles and other raptors.

The endangered mussel, Higgin's pearly-eye mussel (Lampsilis higginsii) is present on the river bottom and will not be affected by these studies.

#### 1.4.2 Historic Preservation

Predator management involves no new ground disturbance nor alteration to structures. Trenches dug for burial of carcasses will be located on previously disturbed sites, particularly in a borrow pit area or a dredge disposal site on the Refuge. Therefore, the Regional Historic Preservation Office has determined that no archeological, architectural, engineering, or historical resources on or eligible for the National Register of Historic Places would be affected by these studies.

#### 1.4.3 Permits

Implementation of the predator management studies is pending receipt of letters of authorization/concurrence from the Wisconsin Department of Natural Resources, the Illinois Department of Conservation, and the Iowa Department of Natural Resources. All three states are preparing such documents as of March 21, 1991.

Refuge and Mississippi Cooperative Fish and Wildlife Research Unit personnel will be directly involved in the predator removal portions of the study on Pool 13. Therefore, Iowa has issued a scientific collector's permit (dated March 6, 1991) to the Refuge, with an amendment to include all personnel involved. Illinois has indicated a scientific permit will be issued to investigators upon receipt of appropriate applications, submitted March 19, 1991. In Wisconsin, actual predator removal activities on the Pool 8 study will be conducted by Wisconsin personnel only, therefore, no permit will need to be issued to the Refuge. Local conservation officers will be notified of the studies in progress and kept current on the predator removal activities.

### Chapter 2: Alternatives Including Proposed Action

#### 2.1 Introduction

This Chapter will describe how various alternatives were developed, which alternatives were selected or dropped from the assessment, provide details of alternatives weighed in the assessment, compare the alternatives, and finally identify the preferred alternative.

#### 2.2 Process Used to Formulate Alternatives

Refuge staff, Region 3 biologists, the Mississippi Cooperative Fish and Wildlife Research Unit Leader, and Wisconsin Department of Natural Resources biologists have developed the study proposals. A draft of this Environmental Assessment was provided to each State conservation agency and additional copies were circulated for public review (responses due March 20, 1991) to one

national organization and 12 local organizations and chapters located near the study Pools. A list of these contacts appears in Chapter 6.

The 30-day comment period for the EA ended March 20, 1991.

As of March 21, 1991, the Refuge received comments from wildlife and law enforcement personnel in the 3 State conservation agencies, all endorsing the studies. The Refuge had not received any comments from the other 13 organizations and groups who were provided the EA, reasons unknown.

Iowa provided valuable comments on study design, permit requirements, and concerns about taking non-target species, such as the otter (Lutra canadensis). Trapping will be avoided in known areas of high otter activity. Iowa conservation officers will be notified immediately if otter are inadvertently taken during the study. Iowa issued a scientific collectors permit to the refuge biologist, as of March 6, 1991, and is amended to include all personnel directly involved in the predator removal activities.

Illinois supports the Pool 13 study and the State office is processing scientific collection permits for individuals from the Refuge and Mississippi State University and Cooperative Wildlife Research Unit.

Wisconsin provided comments on the Pool 8 study concerning design and permit requirements; they are incorporated in the final EA. As noted above, State personnel only will be conducting predator removal activities, therefore, no permit is needed for the Refuge.

## 2.3 Alternatives Eliminated from Detailed Study

Alternatives eliminated from detailed study include :1) contracting professional trappers to complete the study, and 2) utilizing Refuge personnel only to complete the studies. These were eliminated because refuge funding was insufficient and personnel levels were inadequate to dedicate the full time effort required to complete the study.

## 2.4 Description of Alternatives

### 2.4.1 No Seasonal Predator Removal Studies

This no action alternative would leave unresolved the question that emerged from previous studies as to whether seasonal predator removal on selected islands could enhance Refuge duck production. Previous studies demonstrated that small, isolated predator-free islands supported high duck nest densities under natural conditions in Pools 8 and 13. Results showed that approximately 6.6 acres of 10 predator-free islands on the Refuge produced comparable numbers of successful nests as did 186 acres of electric fence predator exclosures in the prairie pothole region of central and western Minnesota (Dahlgren, 3-yr summary report, 9/5/90). While not depreciating the importance of predator exclosures, these data show potential cost-effectiveness of predator removal on certain islands on the Refuge. Removal of a single predator on an isolated island may result in a predator-free condition throughout the nesting season. Both studies will examine this hypothesis.

#### 2.4.2 Lethal Predator Removal Studies - the Preferred Alternative

The Upper Mississippi River National Wildlife and Fish Refuge (Refuge) is proposing to conduct two studies analyzing predator management techniques designed to increase waterfowl nesting success on Refuge islands. Mammalian predators, primarily fox and raccoon, would be removed from approximately 20 Refuge islands in Pool 13 and 5 islands in Pool 8, using lethal means. Annual predator removal will be conducted from April 1 through July 15, 1991 and 1992 in Pool 13, and during the years 1991 through 1999 on Turtle Island in Pool 8. Study islands in Pool 13 are located between River Miles 526 and 534; in Pool 8 they occur between River Miles 684 and 687.

These experimental predator removal studies will be coordinated by Refuge personnel. On Pool 13, Dr. Ed Hill, Unit Leader, Mississippi Cooperative Fish and Wildlife Research Unit, will supervise the study and predator removal activities conducted by a Cooperative Education graduate student and assisted by a Refuge biological technician stationed at Savanna District. The Pool 8 study will be supervised by John Wetzell, Wisconsin Department of Natural Resources, La Crosse; removal activities will be conducted by Department and Fish and Wildlife Service personnel. No outside contractors will be involved in either study.

The Pool 13 study will compare duck nesting success over a 2 year period on 10 islands with predator removal compared to 10 control islands with no predator removal. It is anticipated that 20-30 animals will be removed from Pool 13 islands each of the 2 years. Predators will be removed using cubby/conibear quick-kill traps (raccoon), foothold traps (fox), or live traps (raccoon and fox). Trapped animals will be destroyed using a 22 cal. rifle. Dead animals will be collected in plastic bags, transported to an upland site on the Refuge, and buried in a trench; some animals may be donated to an agency for further research. Traps will be checked daily. Island reoccupation by other predators will be monitored through continuous trapping operations and field inspections on the study islands. Non-target animals will be released at the trap site. The per island cost of removal will be recorded and analyzed. Total maximum number of predators removed during the Pool 13 study is approximately 60 animals over a 2-year period. This study will also determine optimal island habitat and location within the Pool for achieving successful mallard nesting.

The Wisconsin DNR/USFWS study on Pool 8 will involve removal of predators from Turtle Island, and maintenance of predator-free conditions on 4 small islands near Turtle, to determine mallard population responses to long-term predator-free conditions as well as provide high local mallard populations for collateral studies on duckling survival and recruitment. Previous investigations indicate that 4 of these islands have been free of mammalian predators since 1981. Trapping and disposal techniques on Pool 8 will be the same as those used on Pool 13, described above, with the exception that carcasses may be buried on either State or Refuge lands. It is anticipated that 2 to 4 fox, and 3 to 5 raccoon will initially be removed from Turtle Island; subsequent removals will involve 0 to 3 individuals annually. It should not be necessary to remove more than 1 to 5 individuals from the 4 island group, over the

entire 10-year study period. Total number of predators to be removed during the Pool 8 study is approximately 45 animals.

#### 2.4.3 Studies Utilizing both Lethal and Non-lethal Predator Removal Techniques.

Lethal removal techniques are described in the previous section. Non-lethal predator removal techniques include the use of live-traps and leg-hold traps and the subsequent transport and release of trapped animals. Live-trapped animals will have to be subdued using snare sticks and/or anesthesia, possibly endangering the animal and/or trapper. Animals would then be caged and transported by boat to the upper reaches of the navigation pools, and released. This is time-consuming and expensive, and potentially dangerous to animals and investigators. Occasionally, live-trapped animals injure themselves and must be destroyed rather than released.

#### 2.5 Comparison of Alternatives

Both the preferred alternative (lethal predator removal studies) and the alternative using a combination of lethal and non-lethal means could be utilized to achieve predator-free conditions on most of the islands intended for study. However, live-trapping, transport and release of raccoon, fox and other predators requires more investment of time and money than using cubby/conibear traps and leg-holds. These traps will be placed to avoid capture of non-target species. In addition, live-trap, transport, and release techniques will negatively effect predator/prey populations at release sites on the Refuge, possibly negating increased waterfowl production on islands resulting from the study. Local and regional predator populations will not be adversely effected by the removal of up to 30 animals per year in the Pool 13 area, and 8 animals the first season and 0 to 3 animals in subsequent seasons in the Pool 8 studies.

#### 2.6 Preferred Alternative

The preferred alternative is to conduct the two studies using lethal predator removal methods.

#### 3.0 Affected Environment

The Upper Mississippi River National Wildlife and Fish Refuge is the longest wildlife refuge in the lower 48 states, extending more than 260 miles southward from Reads Landing, Minnesota, to near Rock Island, Illinois; it encompasses about 198,000 acres of Mississippi River bottomlands. Twelve of 27 locks and dams on the entire Upper Mississippi River System are within the Refuge boundaries, forming a series of navigation pools, varying from 10 to 30 miles long designed to maintain a 9-foot navigation channel. The dams artificially raised water levels, creating a maze of channels, sloughs, islands, marshlands, and open lakes over the river bottoms since installation in the 1930s.

Predator removal studies will be conducted on Refuge islands located in the lower to mid-pool areas of Pool 8 and Pool 13. These islands range in size

from 0.5 to 15 acres. Island habitat varies from predominantly grassy to brushy to mature forest. Previous nesting studies of these islands revealed that mallards nested in dense tangles of stinging nettle (Urtica dioica) and poison ivy (Rhus radicans), dense will or brush growth, downed trees (bottomland hardwoods), and even in the root whorls of downed trees in almost den-like situations.

The Mississippi River often floods, on average the peaks last 4-10 days, usually occurring in late April or early May, with occasional flooding in June. It is expected that nests on some islands will be lost to flooding depending on timing of flooding and height above water of islands. Renesting will at least partially compensate for flooding. Mallard nesting studies on 4 islands in Pool 8 show substantial nesting efforts over a 10-year period with variable numbers between islands and between years reflecting variable water conditions and effects of predation.

Past studies have shown that human disturbance has influenced nesting on a few islands that have a stretch of sandy beach (Dahlgren, 1990). Four of 34 islands were disturbed by recreationists, resulting in 30% nest abandonment, 3 times the abandonment of undisturbed islands.

Avian predation on duck nests has accounted for up to 9% of nest losses on islands in earlier studies. These were presumably by gulls (Larus argentatus) and/or crows (Corvus brachyrhynchos). No attempts will be made to remove avian predators during the two proposed studies.

#### 4.0 Environmental Consequences

##### 4.1 No Action Alternative

The consequences of a no-action alternative would mean that mallard nesting on predator-free islands would continue on a limited basis on the Refuge. Predators would continue to occupy islands and inhibit waterfowl production, thus impeding our efforts to determining which predator management methods could feasibly be used to help achieve populations goals established by the Refuge Master Plan and the North American Waterfowl Management Plan (NAWMP). Without the studies, our knowledge of potential impacts of island predator removal on nest success, recruitment, cost-effectiveness, island habitat management, and island construction will be greatly restricted.

The no-action alternative will assure that approximately 115 animals (mainly raccoon) will not be removed and destroyed from approximately 25 islands over the next 10-year period. No action will also allow predators to destroy up to 60 nests on a single island per year, as documented by earlier studies on Pools 8 and 13.

##### 4.2 Alternative 2, the Preferred Alternative

The preferred alternative (studies using lethal predator removal techniques) will result in anticipated removal of up to 115 animals. It is anticipated that 20-30 animals will be removed from Pool 13 islands each of the 2 years of

study; total removed is approximately 40-60 animals. Total number of predators anticipated to be removed during the 10-year study on Pool 8 is approximately 45 animals.

Field observations indicate that the vast majority of predators likely to be removed from the study islands will be raccoon; incidental predators will include fox, mink (Mustela vison), skunk (Mephitis mephitis, opossum (Didelphis virginiana) and, possibly, feral dogs and cats. Dogs and cats with collars will be transported to shore and efforts made to locate the owners; it is illegal to allow unrestrained pets roam the Refuge.

Nesting success on small islands could reach 65-70% with up to 200 nests per acre. These studies will possibly lead to implementation of cost-effective predator management techniques on islands to help the Refuge achieve duck production goals identified in the Refuge Master Plan and the NAWMP.

#### 4.3 Alternative 3

The alternative of implementing studies utilizing both lethal and non-lethal predator removal methods will have similar duck production benefits but at the expense of predator/prey disruptions in the non-study areas of the Refuge, as well as increased safety hazards to the trappers and increased costs.

Non-lethal, capture and release predator removal techniques will present an ecological disadvantage for the Refuge. Not only will local populations be disrupted by the study itself, the transport and release of captured animals will cause a second ecological shift in predator populations somewhere else on the Refuge. Displaced animals would potentially compete with current occupants for food, put more pressure on existing prey populations and disrupt existing social structures, thus widening and compounding the study effects on the Refuge.

## 5.0 List of Preparers

Eric Nelson, Refuge Biologist, UMRNW&FR, Winona, MN (Lead)

### Contributors:

\*\*Dr. Ed Hill, Mississippi Cooperative Fish and Wildlife Unit, Mississippi State University.

\*\*Dr. Robert Dahlgren, Asst. Regional Refuge Biologist, La Crosse, WI

\*\*Larry Wargowsky, Savanna District Manager, UMRNW&FR, Savanna, IL

\*\*Ed DeVries, Refuge Operations Specialist, UMRNW&FR, Savanna, IL

\*\*John Wetzal, Wildlife Biologist, WI DNR, La Crosse, WI.

## 6.0 List of Agencies, Organizations, and Persons to Whom Copies of the Environmental Assessment are Sent.

--Mr. Mark Frech, Director  
Department of Conservation  
Lincoln Tower Plaza  
524 South Second Street  
Springfield, Illinois 62701

--Mr. Larry J. Wilson, Director  
Department of Natural Resources  
Wallace State Office Building  
East 9th and Grand Avenue  
Des Moines, Iowa 50319

--Mr. Steve Miller, Director  
Bureau of Wildlife Management  
Department of Natural Resources, Box 7921  
Madison, Wisconsin 53707

The Defenders of Wildlife  
1244 19th Street N.W.  
Washington, D.C. 20036

Conservation, Humane, Hunting, and Trapping organizations in the vicinity of Pools 8 and 13 were provided draft environmental assessments.

### Pool 13 Groups

Quad City Conservation Alliance, Inc.  
P.O. Box 308  
Moline, IL 61265

Izaak Walton League - Clinton Chapter  
North Bluff  
Clinton, IA 52732



Northwest Illinois Furtakers Association  
Dean Heller  
240 N. Main  
Stockton, IL 61085

Mississippi Sportsmen's Club, Inc.  
Rt 84 North  
Thomson, IL 51285

Ducks Unlimited, River Cities Chapter 169  
501 15th Ave.  
Fulton, IL 61252

Ducks Unlimited of Northwest Illinois  
106 S. Hannan  
Mt. Morris, IL 61054

Pool 8

La Crosse County Conservation Alliance  
Harry Meinking  
P.O. Box 933  
La Crosse, WI 54601

Great River Wildlife Center  
Mike Furr  
P.O. Box 695  
La Crosse, WI. 54602

La Crosse Audubon Society  
Laura Johnson  
Rt. 1 Box 244A  
La Crosse, WI 54601

Gopher State Sportsman Club, Inc.  
J.W. Ramsden, President  
P.O. Box 25  
La Crescent, MN 55947

Vernon County Conservation Alliance  
Mike Shastrad  
Rt 3  
Cashton, WI 54619

Humane Society Coulee Region  
Mary Vinson  
2850 Larson St.  
La Crosse, WI 54601

#### Literature Cited

Duebbert, H.F., J.T. Lokemoen, and D. E. Sharp. 1983. Concentrated nesting of mallards and gadwalls on Miller Lake Island, North Dakota. J. Wildl. Manage. 47(3):729-740.

Dahlgren, R. B. 1990. Island-nesting mallards, 1988-90. A three-year summary report (dated 9/5/90) submitted to Region 3, FWS, Regional Refuge Management Biologist.

Wetzel, J.F., J.S. Nelson, and R. B. Dahlgren. 1989. Survey of waterfowl nesting success on Upper Mississippi River National Wildlife and Fish Refuge Islands and implications for habitat projects. In, Proceedings of the 45 Annual Mtng. of Upper Mississippi River Conservation Committee, Wisconsin Dells, WI March 7-8, 1989. UMRCC, 18 32nd Avenue, Rock Island, IL 61201.



IN REPLY REFER TO:

# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

UPPER MISSISSIPPI RIVER NATIONAL WILDLIFE AND FISH REFUGE  
51 E. Fourth Street - Room 101  
Winona, Minnesota 55987

TAKE  
PRIDE IN  
AMERICA

February 21, 1991

### Memorandum

To: Assistant Regional Director, FWS, Twin Cities, MN (ARW)  
Through: Wildlife Associate Manager, FWS, Twin Cities, MN (WAM1)  
From: Refuge Manager, Upper Mississippi River NW & FR, Winona, MN  
Subject: Concurrence/Approval of Predator Removal Research Proposal

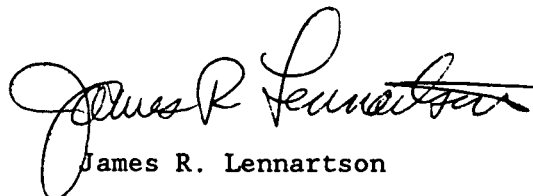
I recommend that the Regional Director provide final approval of the enclosed research proposal entitled "Aspects of Predator Management to Enhance Waterfowl Nesting Success on Islands of the Upper Mississippi River National Wildlife and Fish Refuge."

Please provide your concurrence/approval on the enclosed signature page.

The study will take place on Refuge islands in Pool 13. Predators will be removed from islands using lethal means, therefore, a draft Environmental Assessment (EA) has been completed. It has been submitted to the State biologists along the River in Wisconsin, Iowa, and Illinois in order to facilitate receiving letters of concurrence from Directors of the State Natural Resource Agencies. The EA has been sent to conservation, humane, and sportsman groups in the Pool 13 area, as well as Defenders of Wildlife, Washington, D.C. John Dobrovolny is also providing comments. Public comments will be incorporated into the Final EA.

We intend to initiate predator trapping and removal March 23, 1991, or no later than April 1, 1991.

Thank you.

  
James R. Lennartson

Enclosure

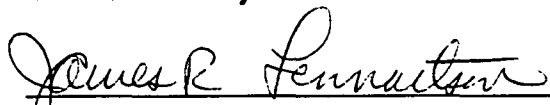
RESEARCH PROPOSAL

ASPECTS OF PREDATOR MANAGEMENT TO ENHANCE  
WATERFOWL NESTING SUCCESS ON ISLANDS OF THE  
UPPER MISSISSIPPI RIVER NATIONAL WILDLIFE AND FISH REFUGE

Submitted by: Dr. Ed Hill, Unit Leader, Mississippi Cooperative Fish  
and Wildlife Research Unit, Mississippi State, MS

Date: February 19, 1991

CONCURRENCE/APPROVAL:

  
Refuge Manager

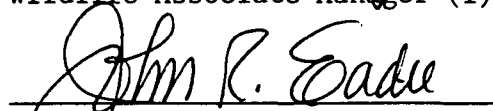
Date: 2/21/91

  
Assistant Regional Refuge Biologist


Date: 2/25/91

  
Act- Wildlife Associate Manager (1)

Date: 3/5/91

  
Assistant Regional Director, Refuges and Wildlife

Date: 3/7/91

  
Regional Director

Date: 3/8/91

## RESEARCH/MANAGEMENT STUDY PROPOSAL

### The Upper Mississippi River National Wildlife and Fish Refuge

by

Edward P. Hill, Leader

Mississippi Cooperative Fish and Wildlife Research Unit

1. Title: Aspects of predator management to enhance waterfowl nesting success on islands of the Upper Mississippi River National Wildlife and Fish Refuge (UMRNW&FR).

2. Project Number: 32579-02

3. Objectives:

1. To compare the nesting success of waterfowl on UMRNW&FR islands containing mammalian predators to that of waterfowl on islands where mammalian predators have been removed.
2. To determine the cost effectiveness of removing mammalian predators from UMRNW&FR islands, and to evaluate selected techniques.
3. To describe habitats and locations of islands within the pool that provide optimal duck production, with recommendations on which types of islands should be selected for predator control and where new nesting islands, if any should be constructed.
4. Determine the extent to which raccoons, important duck nest predators, reoccupy islands from which they were removed.

Justification: Since 1981, studies by R. Nicklaus and J. Wetzel of the Wisconsin Department of Natural Resources (WDNR) and R. B. Dahlgren of the Fish and Wildlife Service (FWS) have revealed a potential for high levels of waterfowl nesting and success on predator-free islands in UMRW&FR. "High nesting densities and success typically occurred on small islands in the lower third of pools within the open water area above locks and dams" (Dahlgren 1990). The practicality of removing predators from islands and its benefits in waterfowl recruitment have not been investigated. Neither the characteristics of islands that have potential for waterfowl recruitment nor the nature by which predators gain access to islands in UMRNW&FR is known.

In open country, it is difficult to control terrestrial predators because individuals from surrounding areas quickly fill the voids left as animals are removed. Islands, such as occur in the UMRNW&FR provide a unique opportunity to remove mammalian predators in spring with a likelihood that few will return before waterfowl have had an opportunity to nest.

As a basis for long-term management strategies to enhance waterfowl recruitment on UMRNW&FR, there is need to (1) validate waterfowl nesting responses on islands where mammalian predators have been removed, (2) determine costs and evaluate effectiveness of selected lethal or nonlethal removal techniques, (3) determine which islands should be selected for predator control, and where new islands could be constructed, and (4) determine the nature by which raccoons reoccupy islands from which they have been removed.

#### Procedure:

A. Methods and Materials: Hypotheses relating to each stated objective will be tested. Based on inspection of aerial photographs and visits to study sites on UMRNW&FR, 20 islands will be selected for study. Mammalian predators on 10 islands, selected randomly from the 20, will be removed using cubby/conibear traps, foothold traps, or live traps as appropriate, by species, and the per-island-cost of removal effort recorded. Islands will subsequently be searched for nesting activity and evidence of nesting will be recorded and summarized. Nesting losses on the study islands, and on other islands as time permits, will be recorded by predator species based on sign at nests. Data will be collected during two reproductive seasons. Statistical comparisons will be made of the waterfowl nesting successes on the two island groups using a 2-way analysis of variance of the percentages of nests that hatch. If a range of island sizes are available for study, three size categories will be selected and the data will be subjected to an analysis of covariance by rank size to determine possible island size effects.

Specific nest locations and study islands will be classified by broad vegetative types, and sketch maps of islands will be prepared to include parameters such as size, and distance from shore or other islands. Recommendations for island construction based on potential for waterfowl reproduction will also be made.

Raccoons will be removed from a series of additional islands situated at varied distances from other islands or either bank. These islands and those in the 10 from which raccoons are removed to achieve objective No. 1, will be visited in late June each year and in March 1992 to determine the extent to which they are reoccupied by raccoons or other predators.

B. Results: Data on predator removal effort and costs, by

species, and data on nesting species, nesting attempts, nesting chronology, hatching rates, and predation losses by species, and data on rapidity and means by which raccoons repopulate islands from which they were removed, will be summarized and reported quarterly.

C. Interpretation of expected benefits: The differences in nesting success on islands where predators are removed compared to that where they are not removed should be significant. Projections of improved nesting success, in terms of total potential enhancement in waterfowl recruitment should provide a basis for developing appropriate Environmental Assessments, the conduct of public hearings and subsequent implementation of management strategies. Estimation of program costs and a determination of suitable and effective control methodology for control of island predators will be provided.

Cooperators: This project will supplement those that are ongoing. Waterfowl and fur resource biologists of states adjacent to UMRNW&FR complex will participate or assist to the extent they wish to be involved. Cooperating individuals and complex biologists and staff are welcomed as participants in project development, conduct of field work, and co-authorship of final publications.

Responsibility: A base from which field work can be done will be needed. If no complex housing or other facilities are available locally, the MS Unit will provide a 22' trailer for housing at the UMRNW&FR complex shop area near Savanna. UMRNW&FR will provide gasoline, suitable boat, motors, and trailer, a biological technician, and during periods of intense searches for nests, additional field assistance. Details and coordination of specific arrangements will be addressed at a planning meeting in January 1991, and as needed throughout the remainder of the study.

Schedule: The initial phase of this study is proposed to begin upon notification of obligated funding and continue for the 1991 and 1992 nesting seasons. Selection of specific islands for study will be made from aerial photographs, based on reconnaissance of individual islands, and will be coordinated with leaders of ongoing projects in late winter 1991 prior to the first field season. Predator removal activities to attain objective No. 1, will begin in mid-March and should conclude on or before the end of April each year. Predator removal activity directed at objective No. 4, should begin and be completed in May each year. Nest checks will begin in mid-April and continue through the end of June each year.

Reports: Progress reports will be rendered in December in time for Complex Annual Narrative Reports. Quarterly progress reports containing summaries of predator removals, nesting parameters, or other accomplishments will be rendered at the end of the month in

March, June, and September of each year. The final report will be rendered in March 1993.

Publications: Results of this study will be submitted to the Journal of Wildlife Management, the Wildlife Society Bulletin, or similar suitable outlet. Portions and short segments of the study results that have wide application will be submitted for release to Service units through the Office of Information Transfer Research Information Bulletin series, and through appropriate state information sources.

Cost:

Proposed Budget			
	FY91	FY92	FY93
Salaries			
Graduate research Asst.	6,400	8,500	4,500
Travel			
Milage or air fare	1,000	1,000	
Subsistence (student)			
150 days per field season at \$15./ day	2,250	2,250	
Supplies and Equipment			
No. 160 Conibear Traps (50)	300		
Cubby Boxes (50)	150		
Live traps (25) at \$30 ea.	750		
No. 2 coil spring leghold traps (12)	00		
Miscellaneous costs			
Field supplies	500	500	
computer charges			100
Publication costs			400
	11,350	12,250	5,000
Total			28,600

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Proposal submitted by: Dr. Edward P. Hill, Leader, Mississippi Cooperative Fish and Wildlife Research Unit.



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## RESEARCH/MANAGEMENT STUDY PROPOSAL

### The Upper Mississippi River National Wildlife and Fish Refuge

by

Edward P. Hill, Leader

Mississippi Cooperative Fish and Wildlife Research Unit

1. Title: Aspects of predator management to enhance waterfowl nesting success on islands of the Upper Mississippi River National Wildlife and Fish Refuge (UMRNW&FR).
2. Project Number: 32579-02
3. Objectives:
  1. To compare the nesting success of waterfowl on UMRNW&FR islands containing mammalian predators to that of waterfowl on islands where mammalian predators have been removed.
  2. To determine the cost effectiveness of removing mammalian predators from UMRNW&FR islands, and to evaluate selected techniques.
  3. To describe habitats and locations of islands within the pool that provide optimal duck production, with recommendations on which types of islands should be selected for predator control and where new nesting islands, if any should be constructed.
  4. Determine the extent to which raccoons, important duck nest predators, reoccupy islands from which they were removed.

Justification: Since 1981, studies by R. Nicklaus and J. Wetzel of the Wisconsin Department of Natural Resources (WDNR) and R. B. Dahlgren of the Fish and Wildlife Service (FWS) have revealed a potential for high levels of waterfowl nesting and success on predator-free islands in UMRNW&FR. "High nesting densities and success typically occurred on small islands in the lower third of pools within the open water area above locks and dams" (Dahlgren 1990). The practicality of removing predators from islands and its benefits in waterfowl recruitment have not been investigated. Neither the characteristics of islands that have potential for waterfowl recruitment nor the nature by which predators gain access to islands in UMRNW&FR is known.

In open country, it is difficult to control terrestrial predators because individuals from surrounding areas quickly fill the voids left as animals are removed. Islands, such as occur in the UMRNW&FR provide a unique opportunity to remove mammalian predators in spring with a likelihood that few will return before waterfowl have had an opportunity to nest.

As a basis for long-term management strategies to enhance waterfowl recruitment on UMRNW&FR, there is need to (1) validate waterfowl nesting responses on islands where mammalian predators have been removed, (2) determine costs and evaluate effectiveness of selected lethal or nonlethal removal techniques, (3) determine which islands should be selected for predator control, and where new islands could be constructed, and (4) determine the nature by which raccoons reoccupy islands from which they have been removed.

#### Procedure:

A. Methods and Materials: Hypotheses relating to each stated objective will be tested. Based on inspection of aerial photographs and visits to study sites on UMRNW&FR, 20 islands will be selected for study. Mammalian predators on 10 islands, selected randomly from the 20, will be removed using cubby/conibear traps, foothold traps, or live traps as appropriate, by species, and the per-island-cost of removal effort recorded. Islands will subsequently be searched for nesting activity and evidence of nesting will be recorded and summarized. Nesting losses on the study islands, and on other islands as time permits, will be recorded by predator species based on sign at nests. Data will be collected during two reproductive seasons. Statistical comparisons will be made of the waterfowl nesting successes on the two island groups using a 2-way analysis of variance of the percentages of nests that hatch. If a range of island sizes are available for study, three size categories will be selected and the data will be subjected to an analysis of covariance by rank size to determine possible island size effects.

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Proposal submitted by: Dr. Edward P. Hill, Leader, Mississippi Cooperative Fish and Wildlife Research Unit.

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