

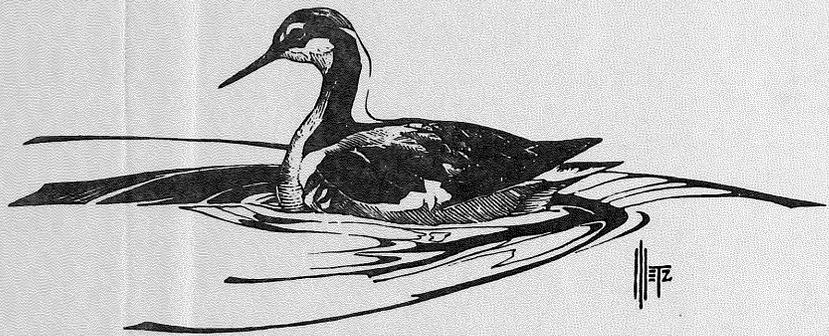
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# **PLAN FOR THE MANAGEMENT OF NONGAME WILDLIFE IN MINNESOTA**

**VOLUME 3 - ISSUES**  
*(review draft)*



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Nongame Wildlife Program

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Plan Volumes

Vol. 1 - The Planning Concept - issued 2/83

Vol. 2 - Resource Analysis - draft issued 9/15/83

Vol. 3 - Issues

Vol. 4 - Goals and Strategies

Vol. 5 - The Operational Plan

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FILE NO. \_\_\_\_\_

May 1, 1984

Dear Friend:

Enclosed for your information and comment is a review draft of Volume 3 of the Plan for the Management of Nongame Wildlife in Minnesota. This Issues document constitutes a description of the major issues which the Department of Natural Resources has identified as significant for nongame resource management in Minnesota.

This draft of Volume 3 is offered for public review. It should be regarded as a reference against which you are encouraged to express your thoughts on the problems facing the nongame resource in Minnesota. Specifically, we need to know if you feel that all major issues have been accurately described in all their aspects. Additionally, you are strongly encouraged to submit your ideas on opportunities to resolve the issues.

Please submit your comments to my attention by June 8, 1984. A comment form is provided for your convenience.

Thank you for your continued interest and participation with the Plan for the Management of Nongame Wildlife in Minnesota.

Yours truly,

ROGER HOLMES  
Chief  
Section of Wildlife

RH:rcm  
Encl.



Plan for the Management of Nongame Wildlife in Minnesota

Volume 3 - Issues

Comment Form

- I. The following are my comments on Volume 3. (Please identify the Issue(s) by title to which your comments relate.)

PLEASE SEE REVERSE SIDE - you must complete name and address portion.

II. Please consider the following as additional opportunities for resolving the Issues (identify the specific Issue(s) to which your suggestion(s) applies.)

---

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Address: \_\_\_\_\_

City/State: \_\_\_\_\_ Zip: \_\_\_\_\_

Agency/Organization: \_\_\_\_\_

Submit by June 8, 1984 - to Roger Holmes, Section of Wildlife, DNR - Division of Fish and Wildlife, Box 7, Centennial Building, 658 Cedar Street, St. Paul, Minnesota 55155.

Plan for the Management of  
Nongame Wildlife  
in Minnesota

Volume 3 - Issues

Date: May 8, 1984

Minnesota Department of Natural Resources  
Division of Fish and Wildlife  
Nongame Wildlife Program  
St. Paul, Minnesota

Funded by: Minnesota citizens through their  
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## INTRODUCTION

This document, Volume 3 - Issues, represents the mid-point in the Plan for the Management of Nongame Wildlife in Minnesota. It is based on the two preceding volumes which described the scope and content of the planning process (Volume 1 - The Planning Concept) and provided background information (Volume 2 - Resource Assessment) necessary for the development of this document.

The issues that the Nongame Wildlife Program must address are described in the present document. Each issue is a major resource-related matter. Each is a focal point for Nongame Wildlife Program efforts on behalf of the nongame resource.

The eight issues presented in this volume have been identified by Nongame Wildlife Program (NWP) personnel, assisted by a Technical Advisory Committee of representatives from other Department of Natural Resources disciplines and by the general public (Minn. Dep. Nat. Resour. 1981). Although the issues are interrelated, they are presented individually in separate chapters. Each issue is concisely described in the Issue Statement and introductory paragraph at the beginning of the chapter. This introduction provides a focus for the Discussion section that follows.

The Discussion section further describes different aspects of the Issue including a historical perspective delineating causes of the Issue; a review of past actions to define, monitor and/or resolve the Issue; and a statement of potential consequences to the resource of not resolving the Issue.

The last section of each chapter is an outline of Opportunities to Resolve the Issue. These opportunities are not policy recommendations.

They are statements of potential ways that have so far been identified as approaches for dealing with a specific Issue. Various combinations, the opportunities may serve as the basis of strategies for Issue resolution to be delineated in Volume 4 (Goals and Strategies). They may even become future NWP policy recommendations.

This volume serves two important functions. First, it provides a description of the issues identified as important for the management of Minnesota's nongame resource. Secondly, Volume 3 serves as the basis for formulating the Nongame Wildlife Program's strategic plan (Volume 4 - Goals and Strategies) and Operational Plan (Volume 5). In these subsequent volumes, goals and strategies will be developed to correspond with each Issue.

The issues are dynamic and complex. Their relative importance may be perceived differently by various people. Their implications for the resource will certainly change as future environmental, economic, social and political conditions evolve. This volume will need periodic revision. Your comments on its contents are encouraged and welcome.

## COMPREHENSIVE PLANNING

Issue Statement: LONG RANGE COMPREHENSIVE PLANNING IS NECESSARY FOR EFFICIENT AND EFFECTIVE OPERATION OF THE NONGAME WILDLIFE PROGRAM IN A MANNER CONSISTENT WITH RESOURCE NEEDS AND CITIZEN INTERESTS.

The Nongame Wildlife Program can operate more effectively and efficiently if guided by a comprehensive plan. Resource needs and priorities, citizen desires, and the long-term consequences of Program actions must receive appropriate consideration. There is a need to develop a nongame management plan that: 1) defines the scope and limits of the Nongame Wildlife Program's responsibilities; 2) identifies the Program's goals and priorities; and 3) effectively guides Program activities toward accomplishment of its mission to meet resource needs and citizen desires.

Discussion: In Minnesota, primary authority for the management of wildlife resides with the Commissioner of the Department of Natural Resources (DNR) who is empowered to preserve, protect and propagate all desirable species of wild animals ( Minn. Stat. Sec. 87.48 subd. 8). The Division of Fish and Wildlife is responsible for implementing the Department's wildlife conservation programs. Traditionally, the Division's programs have focused primarily on habitat acquisition and management, research, census, restoration projects and regulatory actions primarily to enhance the status and harvestable supply of game species. While authority to manage nongame species existed, money was not available. In 1971, the Department was given specific responsibility for the management of certain nongame species through the Threatened and Endangered Species Protection Act (Minn. Stat. Sec. 97.489).

In 1977, the Section of Wildlife initiated the Nongame Wildlife Program as the Department's response to growing public interest in the well being of the State's entire wildlife resource. The Program was staffed by one full-time biologist financed from the Game and Fish Fund. In 1980, the Nongame Wildlife Program's potential to fulfill its responsibilities was enhanced by the passage of the Minnesota Nongame Wildlife Checkoff law (Minn. Stat. Sec. 290.431(1981 Sup.)) establishing the Nongame Wildlife Fund with revenues derived from voluntary citizens' donations. Within two years, a staff of seven full-time personnel, with an annual operating budget exceeding \$500,000, was conducting more than 50 resource management projects (Minn. Dep. Nat. Resour. 1984a).

The rapid expansion of Minnesota's nongame program typifies the growth of state nongame programs following Colorado's creative financial initiative in implementing the first checkoff legislation in 1977. Currently, 32 states operate resource management programs funded by citizen donations through checkoff programs. Such programs exemplify nationwide interest and concern for all wildlife and other natural resources.

It is difficult to guide the long-term direction of such programs during the early stage of rapid growth. A number of constraints may impede program operation. One of the most critical of these is the need for adequate funding (Howard et. al. 1980).

Tax checkoff legislation has not completely resolved the matter. Obtaining funds via public donation requires considerable promotional effort. To some extent, this compels selection of highly visible management projects featuring popular, well-known species. The challenge is to encourage citizen participation while balancing resource needs, promotional considerations and public preferences for fund allocation (Boggis 1984).

A consistent level of funding is not guaranteed from checkoff revenue. In Minnesota, current financing is not adequate to simultaneously undertake all the actions which so far have been identified for the conservation of Minnesota's nongame resource (Minn. Dep. Nat. Resour. 1981). Consequently, priorities must be defined (see Issue on Endangered Species).

Another interim problem has been the absence of legal mandates describing the scope of the Program's responsibility or providing an operational definition of the term "nongame". As a consequence, the Nongame Wildlife Program is still working to clarify its responsibilities relative to some of the 600+ vertebrate species and their habitats that constitute Minnesota's wildlife resource.

The Department's obligation for endangered and threatened species is a legislative mandate. However, bobwhite quail, prairie chicken, sandhill crane, elk, pine marten, woodland caribou and invertebrates are examples of species for which NWP jurisdiction and management responsibilities are unclear. The confusion regarding the meaning of the term "nongame" is not unique to Minnesota. Nationwide, there is no standard or generally accepted definition of nongame. The various states with nongame programs have different operational definitions, none of which conform exactly with the federal definition articulated in the Fish and Wildlife Conservation Act of 1980.

More than 35 governmental and private agencies or individuals have been identified (Minn. Dep. Nat. Resour. 1983b) which conduct or regulate activities affecting the nongame resource in Minnesota. The need exists to improve coordination and leadership among these groups in order to reduce confusion and competition, identify responsibilities, and more sharply focus on the implementation of a comprehensive, statewide resource management

effort in which all agencies and individuals can participate effectively (see Issue on Coordination).

Approximately two-thirds of the state's vertebrate species are presently considered nongame. The NWP's ability to address the needs of these nongame species is restricted in part because the species' ranges extend beyond the state's boundaries. Therefore, interagency coordination at the state and regional level will be needed for successful implementation of some management actions.

Nongame resource management is a recent field which is still evolving from the traditions of game management and an understanding of ecological principles. Existing nongame programs are relatively new, the animals under their jurisdiction have usually not been managed, and few precedents exist on how to proceed. In many cases the information on life history and distribution of nongame species is scant. Species and habitat management techniques are often undefined or nonexistent (see Issues on Data Management and Data Acquisition). However, exciting and innovative actions are being achieved (Temple 1983, Nongame Wild. Assoc. N. Am. 1983). These recent advances in the nongame management field, coupled with the rapid expansion of management programs and the considerable effort required to promote public participation in program financing must be accomplished by thoughtful planning, including in-depth review of resource and data management needs.

The primary purpose of planning is to become more effective at realizing results (Crowe 1983). A comprehensive plan has been identified by Nongame Wildlife Program personnel and Department administrators as necessary for the effective and efficient operation of both the Nongame Wildlife Program and the Division of Fish and Wildlife. Planning appears to be the only realistic way to simultaneously address all constraints impeding

effective resource management and Nongame Wildlife Program operation.

The consequences to the nongame resource of a failure to address the constraints through development of a comprehensive plan relate to the possibility that projects chosen without the benefit of thoughtful planning may not be priorities for the resource. Major resource needs may even be entirely overlooked and the citizens' mandate to insure the well-being of all the state's wildlife may not be adequately met.

The first steps have already been taken in response to the planning need. At the federal level, both the U.S. Fish and Wildlife Service and the U.S. Forest Service have implemented planning efforts intended, in part, to identify priority resource needs and federal management actions for selected nongame species (U.S. Dep. Inter. 1983; U.S. Off. Fed. Register 1983a; Salwasser and Mealey 1982; Suring and Mathisen 1983).

At the state level, a planning position was created within the Nongame Wildlife Program in 1982. Subsequently, a nongame plan (Minn. Dep. Nat. Resour. 1983a) was initiated.

To date, the Nongame Wildlife Program's planning effort has: 1) produced a resource assessment, 2) proposed an operational definition of the term "nongame" in order to clarify the Program's scope of responsibility, and 3) identified eight major resource issues.

With such a comprehensive planning process now underway, the Nongame Wildlife Program will, in the next year, begin to address the needs and priorities as identified in the planning effort. Projects may continue as in the past, priorities may be reordered, or new projects may be initiated. This initiative, coupled with existing state and federal planning efforts, should enhance the effectiveness of all programs intended for the benefit of the citizens and the nongame resource.

Opportunities to Resolve the Issue:

1. Prepare a general statement on behalf of the Division which officially defines the term "nongame", delineates the Nongame Wildlife Program's responsibilities within the scope of the Division's obligations to wildlife, and sets forth the Program's philosophy and policies.
2. Continue an ongoing planning effort for the Nongame Wildlife Program which establishes Program goals and strategies for goal attainment; develops Program policy, and designates a priority of Program effort for the protection and preservation of the nongame wildlife resource through research, management, public education, and suggests actions for other agencies, and monitors implementation of the plan.
3. Encourage the Division of Fisheries and Wildlife to develop a comprehensive long range plan which would clarify Division policy and the relationship of the Nongame Wildlife Program to other Division and Department programs and responsibilities.
4. Maintain flexibility in the current Program organization so that adjustment of personnel and funding may be made if needed to implement priority actions defined by the planning effort.
5. Review existing NWP organizational structure in light of goal and strategy recommendations.
6. Future legislative mandates may be initiated to adjust Nongame Wildlife Program priorities. Every effort should be made to assure that such legislative initiatives remain consistent with

Program goals and strategies.

7. Seek expansion of the U.S. Fish and Wildlife Service and other agencies' interest and activities on behalf of nongame species.
8. Initiate an effort with other agencies and organizations to jointly design and implement a course of action for the conservation of the nongame wildlife resource in Minnesota and nationally.
9. The U.S. Fish and Wildlife Service and U.S. Forest Service should implement their management plans in a timely manner and coordinate with the Nongame Wildlife Program.
10. The Division of Fish and Wildlife's planning effort should be funded.
11. Seek citizen participate in review of the Nongame Wildlife Program's planning effort.

## COORDINATION TO ENHANCE NONGAME RESOURCE CONSERVATION

Issue Statement: IMPROVED COMMUNICATION AND COORDINATION AMONG THE MANY PUBLIC AGENCIES, PRIVATE ORGANIZATIONS AND INDIVIDUALS THAT CONDUCT ACTIVITIES WHICH AFFECT THE NONGAME RESOURCE IS NEEDED TO MAXIMIZE NONGAME RESOURCE CONSERVATION EFFORTS.

Many organizations influence, regulate, and undertake activities that affect the nongame resource. The individuals representing these organizations motivate legislators and governmental agencies to act in ways that may substantially impact the nongame resource. There is a need to improve communication and cooperation among these groups in order to encourage coordinated actions that enhance nongame resource conservation efforts in Minnesota.

Discussion: Natural communities are interconnected, interdependent systems that function as a unit. However, responsibility for management of the various components of these natural systems has been administratively partitioned. While this "division of labor" may make the work easier, it is an artificial separation. The wildlife, vegetation, soil, water and air cannot be separated. Ideally, all need to be considered together. Ultimately wildlife is a product of the land. The quality of the wildlife resource is a reflection of the quality of the other components of the ecosystems.

Minnesota has a wealth of wildlife species associated with its land, air and water. Insuring the future existence of all of these animals is a complex and difficult task requiring cooperation and consideration of wildlife needs by the various groups influencing natural resource

utilization.

For some agencies, consideration of nongame species, while of greater concern today, is not new. The Migratory Bird Treaty Act of 1918 mandated federal protection for many species of nongame birds. More recent federal legislation has included the Bald Eagle Protection Act (1940), the Endangered Species Act (1973), and the Fish and Wildlife Conservation Act of 1980. In addition, state statutes protecting some nongame species have been in existence for a long time.

In response to public expectations and insistence that the government manage these species, state and federal wildlife agencies and other regulatory organizations have recently become more attentive to the needs of nongame wildlife. In Minnesota, more than 30 governmental agencies have so far been identified that impact the nongame resource.

#### Intra-Agency Coordination

Within the Department of Natural Resources, the actions and policies of all Divisions have the potential to affect nongame wildlife. Peatland development is a good case in point. Regulation of peat mining is under the control of the Division of Minerals. The constraints which necessitate the Division of Mineral's consideration of the needs of wildlife associated with peatlands requires coordination with the Division of Fish and Wildlife. A number of assessments have been jointly undertaken by the two Divisions to provide information on the consequences of peat mining for wildlife and on the mitigation alternatives possible to minimize potential adverse effects.

Similarly, the Division of Forestry controls extensive land areas throughout the state. The Division of Forestry also influences many industrial, county, and private forest landowners. Timber management on these public and private forest lands has a substantial influence on nongame

wildlife. The consequences for forest management of this timber/wildlife interrelationship are acknowledged by the Division of Forestry in the statement: "The increasing public interest in nongame species has placed greater demands on natural resource agencies to assess the ecological impacts of timber and forest game projects and to manage for ecological diversity rather than concentrating management on a few species" (Minn. Dep. Nat. Resour. 1982a).

Opportunities for integrating timber and wildlife management already exist in Minnesota through the Forestry/Wildlife Coordination Policy and the Forestry/Wildlife Coordination Guidelines to Habitat Management (Minn. Dep. Nat. Resour. 1982b). A number of nongame concerns are currently addressed in these guidelines. A necessary step to promote further consideration of nongame resource needs by forest land managers is development of additional guidelines specific to nongame. Actions to accomplish this have already been initiated by Nongame Wildlife Program personnel.

The Division of Parks and Recreation has management authority for state park lands. These parks, important to the nongame resource, are managed primarily as reserves. As such, they offer an opportunity to manage for special conditions such as old growth forest types or for endangered species habitats. In the agricultural areas, these park lands provide an appreciable amount of undisturbed habitat, particularly woodlands. Additionally, park employees provide natural resource interpretive services to nearly 500,000 visitors annually. Much of this programming focuses on wildlife. The appropriateness of coordination with the Division of Parks and Recreation is obvious.

Water is an essential habitat component for all wildlife. Water resource management is the responsibility of the DNR's Division of Waters.

The benefits to the nongame resource of a water management program considerate of the needs of the resource are many.

Of critical importance is the Nongame Wildlife Program's relationship to other programs of the Division of Fish and Wildlife. The Nongame Wildlife Program must clarify the mechanisms for incorporating its concerns and information into the Division's policy and decision making network. Because of the Division's past emphasis on programs for game species, and some differences in the habitat needs of various wildlife species, there may be some revisions needed in current programs to assure that all Division actions reflect a comprehensive approach to wildlife conservation.

The Nongame Wildlife Program interacts significantly with the Scientific and Natural Areas and Natural Heritage Programs. Together, these three programs are the Department's first real commitment to the management of plants, animals and natural habitats not traditionally a focus of Department activities to maintain natural diversity. Clarification of each program's responsibilities, functions and goals relative to the nongame resource is necessary to avoid duplication of effort and maximize effectiveness.

In addition, the Nongame Wildlife Program needs to communicate with the Department's Office of Planning, Land Bureau, Division of Enforcement, Environmental Education Board, the Trails and Waterways Unit, Division of Waters, and the Bureau of Information and Education. The formal mechanism for interaction is through the Department's Planning and Environmental Review Team which coordinates policy development and other major Division actions. Coordination and communication among the disciplines on less substantial matters is informal and depends on direct contacts among agencies' personnel.

Except for the Division of Wildlife, consideration of wildlife needs is a secondary responsibility of all Department disciplines. Consequently, there will be differences in goals and policies between wildlife, recreation and resource utilization that will require compromise. It is also recognized that perfect coordination and communication is not possible. When necessary, these differences can be minimized through memoranda of understanding, joint goal setting sessions, joint policy statements, periodic information meetings, work agreements and other appropriate means.

#### Inter-Agency Coordination

Numerous other governmental agencies affect Minnesota's nongame species in one way or another. In addition to the DNR, both the U.S. Fish and Wildlife Service and the U.S. Forest Service have direct responsibilities for nongame species conservation. The NWP's working relationship with these agencies involves exchanges of information and coordination of programs to avoid duplication of effort.

Most other agencies do not have wildlife as their major charge. They impact the nongame resource through the activities that they conduct or regulate (e.g., Pollution Control Agency, Environmental Quality Board, MN Department of Agriculture). It is vital that the Nongame Wildlife Program remain informed of these regulatory actions so that information, assistance or management actions can be provided when needed or requested by the agency. While communication with these agencies has been active in the past, improved communication is desirable.

It is the Division of Fish and Wildlife's responsibility to encourage the incorporation of information on wildlife resource considerations into the decision making process of these other agencies whenever their activities impact the resource. For this to occur, it is important that the

data base from which such information comes is accurate, complete, and readily available. The Nongame Wildlife Program's role in this regard is discussed as part of the Data Acquisition and Data Management Issues.

#### Private Organizations

A diverse group of private organizations interested in the management and utilization of natural resources, including nongame wildlife, exists in Minnesota. Collectively these groups motivate legislators and other governmental agencies to make land use decisions which substantially impact the nongame resource. These organizations must be identified and their interest and support for nongame species encouraged. Such private organizations include:

- a) The Nature Conservancy.
- b) The Minnesota Ornithologists' Union.
- c) National Audubon Society, The Sierra Club, Izaak Walton League, Minnesota Conservation Federation and other citizen conservation organizations.
- d) The Farm Bureau, Farmers Union, National Farmers Organization and other agricultural organizations.
- e) Industrial organizations such as those of the timber and mining industries.
- f) Private landowner and lakeshore associations.
- g) Professional groups such as The Wildlife Society and the Society of American Foresters.

A good working relationship has developed between the Nongame Wildlife Program and many of these organizations as well as among the groups themselves. However, there has been little or no communication with some of the groups. This is probably due to the fact that situations requiring

communication with these groups have not arisen. The lines of communication must be opened with these groups to avoid confrontations when nongame resources are affected. Knowledge and communication is preferable to after-the-fact "crisis management".

The potential complexity of involvement in nongame management on the part of these various agencies and groups is exemplified by the endangered five-lined skink. The total habitat of this species in Minnesota is approximately 2,000 acres. This habitat is owned or managed by numerous private individuals, a private corporation, the Minnesota Department of Transportation, a county park, a county historical society, a county highway department, a municipal park, county administered tax-forfeited land, and The Nature Conservancy. It is vital that there be close coordination among the various groups to assure that resource issues important for five-lined skink management are addressed by the proper parties with a minimum duplication of effort. In this particular case, the Nongame Wildlife Program is serving as the coordinating agency. In other situations it may only be necessary for the NWP to serve as a source of information to the coordinator.

Coordination is a matter of communication and cooperation. It is difficult to accomplish unless the responsibility for coordination is clearly defined, all important participants are identified and are also willing to cooperate, and information is exchanged in a timely manner. Leadership responsibilities must be clearly designated and actively assumed in order to successfully implement coordinated efforts.

There is an expectation on the part of other private and public groups that the Nongame Wildlife Program should assume all responsibility for coordination and leadership of nongame resource management in Minnesota.

The Nongame Wildlife Program is small and alone cannot do all that is needed. In some instances, it may serve the needs of the resource very well by assuming coordination or leadership responsibilities. In other circumstances it may more appropriately function as a catalyst to encourage other agencies with the necessary experience and administrative skills to assume leadership or coordination roles for specific tasks. The Nongame Wildlife Program might also function to prompt and promote a more coordinated nationwide effort for nongame management through the U.S. Fish and Wildlife Service and the Nongame Wildlife Association of North America. The need is to develop a coordinated, statewide resource management effort in which all agencies and individuals can participate effectively.

#### Opportunities to Resolve the Issue

1. The Nongame Wildlife Program should initiate joint planning sessions with other agencies/organizations to delineate areas of responsibility and interest, establish goals, cost share operational costs where appropriate, and cooperatively initiate actions to preserve and manage the nongame resource in a coordinated manner. Specific attention should be given to coordination with Division of Fish and Wildlife's programs, particularly the Natural Heritage Program and the Scientific and Natural Areas Program.
2. Develop or revise Forestry/Wildlife Coordination Policy, Habitat Guidelines and other similar policies and cooperative agreements with DNR divisions, other state agencies, and public or private organizations to encourage integration of efforts.
3. Conduct special orientation programs and joint training sessions to familiarize other agency personnel with the Nongame Wildlife

Program goals and activities such as the endangered species law and listing process; and conversely, to familiarize Program personnel with other agencies' responsibilities and activities.

4. Jointly initiate and fund studies with other agencies or individuals on resource management considerations of mutual interest.
5. Identify areas where duplication of effort is occurring and develop strategies to cooperatively proceed in a more efficient manner, (e.g. depredation and nongame wildlife control matters including extension education material).
6. Work directly with agricultural organizations, the timber and mining industries and private landowner associations to increase their awareness of nongame wildlife resources, the Nongame Wildlife Program, and opportunities for joint initiatives of mutual benefit.
7. Promote an understanding within the private groups of the extensive citizen interest and support which exists in Minnesota for nongame resource conservation.
8. Encourage a Division of Fish and Wildlife planning effort to more clearly delineate the relationships between the Nongame Wildlife Program and other Division programs within the context of the Division's overall responsibility for statewide wildlife resource management.
9. Seek out specific opportunities to work with county and municipal government agencies on cooperative projects of research or inventory or management and in providing technical assistance to their personnel for management of nongame on county lands.

10. Through the existing interagency network, implement a mechanism to assess any nongame concerns which may be identified in the environmental review process of other governmental agencies (EOB, PCA, etc.).
11. Improve the Division's knowledge of the economic value of the states wildlife resources. Most agencies are used to dealing in terms of dollar values. When the Division can communicate for wildlife in economic terms, there will be greater appreciation of this value by other agencies. Such understanding will improve other agencies' consideration of wildlife needs.
12. Work on innovative, cooperative nongame management projects with selected District Foresters, Park Managers, private landowners and other to demonstrate coordinated management. Publicize these efforts at appropriate meetings.

## PUBLIC AWARENESS AND APPRECIATION

Issue Statement: PUBLIC AWARENESS, UNDERSTANDING AND APPRECIATION OF WILDLIFE NEEDS AND VALUES MUST BE ENCOURAGED IN ORDER TO ENHANCE PUBLIC INVOLVEMENT WITH THE WILDLIFE RESOURCE.

A well-informed citizenry is the most important advocate of wildlife conservation. Many Minnesotan's are concerned about the state's wildlife resources. This interest should be nurtured to improve their understanding of wildlife resource needs in order to insure a future for all wildlife in Minnesota.

Discussion: People who are knowledgeable and concerned about natural resource management are the Department's strongest allies in successfully protecting and enhancing wildlife resources. A fair proportion of Minnesota citizens are concerned for the state's wildlife resources, as exemplified by their participation in support of Division programs, particularly the nongame tax checkoff (see Issue on Funding).

However, even the concerned citizens are not necessarily well-informed. Many wildlife enthusiasts are unaware of the principles of population biology, ecosystem dynamics or wildlife management. As a consequence, their actions on behalf of the wildlife resource may be inadvertently detrimental to the wildlife resource or counter to agency actions. The enthusiasm, energy and money of these well-meaning citizens need to be channeled in directions that work in concert with agency programs for the benefit of wildlife.

At the other end of the spectrum is an indifference to wildlife and its habitat needs coupled with an absence of public understanding that is

detrimental to many wildlife populations. The action of landowners may be unknowingly destructive of wildlife habitats, especially for those species that are inconspicuous or not well known. There is also a prejudice against certain species such as reptiles, bats, and predators. In some cases, an unnecessary fear results from ignorance of the animals' habits and of their value as part of the ecosystem. Such attitudes often result in harassment, capture and killing of wildlife to the extent that local populations may be destroyed and important or unique habitat lost (see Issue on Habitat).

It is difficult to generate support or enthusiasm for agency programs directed towards species that the public dislikes, fears or has never heard of before. For these reasons, there is a need to increase the general public's awareness of nongame species that occur in Minnesota, raise their level of appreciation of these species and change negative attitudes towards certain species. There is also a need for increased education and understanding of ecological principles in order to focus concern and action on the most important consideration for wildlife - the maintenance of habitat.

There is a second aspect of this issue. Beyond a consideration of public awareness, there is the matter of public participation. These are two separate processes that may be difficult to distinguish.

Public awareness is a process of informing and educating the public. Public participation is a more complex process of citizen involvement in shaping the direction of the NWP either through review and comment or direct contribution of effort to the NWP's research, habitat management or promotional activities.

Public participation in the development of a nongame management plan is encouraged under federal planning guidelines. The Nongame Wildlife Program

sincerely desires such input, and a mechanism to encourage such review and comment has been established (Mn. Dep. Nat. Resour. 1983a).

In the past, many citizens were satisfied with governmental action. Increasingly, people want to participate directly in projects and activities to benefit wildlife. In this regard, a number of private citizens have shown considerable initiative in establishing a privately operated wildlife rehabilitation network in Minnesota. Often, however, interested citizens have not had coordinated opportunities available to them.

A number of opportunities currently exist for public participation in Nongame Wildlife Program operation. However, a need exists to improve the effectiveness of this participation. There also appears to be a need to provide new opportunities.

Historically, the major interest in wildlife, and thus the greatest public knowledge, has been for game species which were considered "valuable". Knowing the habits of game animals was often a necessity for survival in a wilderness frontier. The early white settlers of Minnesota lived off the land until acreage could be cleared and plowed. Furbearers, such as beaver and fox, were valuable from a monetary standpoint while deer and rabbit were meat on the table.

As agriculture expanded and settlements grew to towns, wildlife species that were valuable needed protection from over-hunting. Wildlife protection agencies were created which established hunting seasons and limits on the number of game animals that could be legally taken. However, other wildlife species, some a nuisance while others harmless or beneficial, were still indiscriminately killed. The thinking was that predators conflicted with livestock operations and took game animals. Thus, predators were bountied. Although there was some interest in nongame species on the part of a few

naturalists, scientists, or birdwatchers, most people gave little thought or time to nongame wildlife.

After World War II, the growth of Minnesota's major cities drew people from the country and small towns and away from direct contact with wildlife. As generations were raised in urban and suburban settings, their experience and need for knowledge of wildlife declined. Those that still enjoyed the outdoors participated in weekend fishing or hunting trips. Inner city residents became far removed from most wildlife - knowing only the urban adapted sparrows, pigeons and squirrels. Those who stayed on the farm often considered wildlife a nuisance, competitor or target. Pesticides and other persistent poisons were used freely to protect farm crops and increase production.

During this time, agencies continued to focus on the consumptive use of wildlife with programs promoting the value of game species. Wildlife managers concentrated on deer, grouse, pheasants, ducks and their habitats in rural and undeveloped areas of the state. The managers were unable to give much attention to songbirds, reptiles or amphibians. Actions on behalf of wildlife in the urbanizing environments consisted of providing technical assistance in response to citizen complaints resulting from unpleasant human-wildlife interactions.

The environmental movement which developed in the 1970's has grown to become a powerful social and political force (Naisbitt 1982). Concern for pollution, toxic wastes, pesticides, habitat degradation and endangered species, along with a realization of the limit to natural resources, profoundly influenced urban-raised and university-educated residents as well as those on farms and in small towns. Interest in wildlife changed from primarily consumptive to include nonconsumptive activities as well.

Birdwatching became the fastest growing wildlife recreational activity in North America (Butler 1983), with many participants enjoying the activity in their own backyard. Membership increased in the National Audubon Society, the Sierra Club and other organizations as citizens organized to lobby for environmental issues.

The concentration of this new constituency of wildlife enthusiasts and environmentalists in urban areas, combined with increasing citizen demand for agency personnel to do something about bats in attics and snakes in basements, prompted a new concept - urban wildlife management.

The significance of urban wildlife is that it is potentially that portion of the resource with which the majority of citizens interact. Consequently, urban wildlife can potentially be used to increase citizen awareness and pleasure from wildlife. The purpose of urban wildlife management may be seen as promoting, through education and information techniques, enjoyment, understanding and satisfaction from wildlife in the citizens' everyday lives.

The role of federal, state and private organizations in urban wildlife management has been discussed elsewhere (Noyes 1974). A number of states have recently established an urban wildlife management program with nongame checkoff revenue. Establishment of such a program in Minnesota has been suggested as one alternative for improving citizen awareness and appreciation for wildlife.

The current situation in Minnesota is mixed with regard to interest, appreciation, and knowledge of the nongame wildlife resource. A small percentage of the population can be considered well-informed. A large number of people are interested or aware of some nongame species, such as robins and eagles, but have little knowledge of less conspicuous species, or

of the need for habitat protection. Within this group are those who want to learn more and those who can be shown that they should learn more.

It has become apparent that the demand for wildlife information has increased to a level where available Department of Natural Resources personnel and facilities alone can not provide for all public demands. The DNR's Bureau of Information and Education handles the task of informing and educating Minnesota's residents about the state's fish and wildlife resources. This has been done primarily through the distribution of the Volunteer magazine, loan of films, and news releases. Much of this information reaches people who are already interested in wildlife and probably have some prior knowledge of natural resource management. Also, much of this information relates to ongoing DNR programs--primarily game and some endangered species.

These traditional approaches and techniques have generally been inefficient, however, in reaching the broad cross-section of general public audiences with constructive, informational, and inspirational messages regarding wildlife conservation needs and opportunities. Such shortcomings could be overcome by increasing the use of modern electronic media and sound public relations principles. However, funding for such efforts has always been limited.

The Minnesota Environmental Education Board (MEEB) within the DNR was established by the Minnesota Legislature in 1973. Consisting of a state board and 13 regional volunteer councils, the major function of MEEB is to increase the awareness of Minnesota citizens about issues relating to the environment and natural resources. MEEB focuses primarily on land use, energy and water quality issues. Cooperatively MEEB, the NWP, and the State Department of Education have recently brought Project WILD to Minnesota's

schools.

Project WILD is an interdisciplinary, supplementary environmental and conservation education program for elementary and secondary educators. Emphasizing wildlife as a way to understand our responsibilities to all living things, Project WILD's goal is "to develop awareness, knowledge, skills and commitment which will result in informed decisions, responsible behavior and constructive actions... for wildlife, and the environment upon which all life depends."

There are other governmental agencies and private organizations that promote awareness and concern for nongame wildlife through their various activities. These include the U.S. Fish and Wildlife Service, U.S. Forest Service, the local National Audubon Society chapters, county conservation reserves and nature centers, the James Ford Bell Museum of Natural History, the Science Museum of Minnesota, the Minnesota Ornithologists Union, the Minnesota Herpetological Society, and Minnesota Humane Society and others. Recently, 60 facilities were identified, including 25 in the seven county metropolitan area, which provide wildlife and environmental education information (Minn. Nat. Assoc. 1984).

Despite all these efforts, it is apparent that the message is not reaching that segment of the citizenry that is unconcerned or poorly informed about wildlife. Unless public awareness and understanding of wildlife is encouraged and increased, it can be expected that the wildlife resource will continue to suffer loss of habitat and, for some species, unnecessary persecution.

#### Opportunities to Resolve the Issue

1. Delineate publics and their information needs. Survey public attitudes toward and knowledge of various nongame species and

their needs. Identify the type of wildlife experience preferred by these publics (Kellert 1980) and design NWP actions to focus on providing for those perceived needs and interests by promoting existing facilities and programs. Identify areas of misinformation, lack of information and negative attitudes, and acquire and utilize educational products, to solve such problems.

2. Conduct public awareness campaigns to increase awareness and appreciation of nongame species and their habitats. These programs should stress the importance of habitat and focus on basic ecological principles such as food chains and predator-prey relationships. They should also inform the public of DNR projects that involve nongame species.
3. Develop or acquire educational materials and programs which encourage educators to provide information about nongame wildlife species and ecological principles. The most effective methods for reaching and influencing the most people should be employed. Both the general public and the school systems should be targeted. Youth groups like 4-H and Scouts should also be considered.
4. Promote awareness and understanding of the economic benefits and values of wildlife and the ecological advantages of retaining habitat for wildlife.
5. Develop an urban wildlife component for the Nongame Wildlife Program that would concentrate on increasing public awareness and appreciation of wildlife in the Minneapolis/St. Paul and other metropolitan areas.
6. Simplify and promote usable and understandable wildlife

protection and possession regulations. Repeal bounties on venomous reptiles and upgrade wildlife possession regulations as needed for native and exotic species.

7. Develop new methods/information system to deal with nuisance wildlife complaints in a cost-effective manner.
8. Promote community environmental programs and distribute nongame information through the existing MEFB network, or through purchase of materials such as movies and slide-tapes for local use and distribution. Work closely with local conservation and sportsmen's groups.
9. Consider the development of a well-planned volunteer program. Possible activities include loon and heron colony observations, bird house and feeder observations, or backyard wildlife habitat programs.
10. Promote citizens support for legislative actions on environmental issues.
11. Consider the creation of a citizen advisory body for the Nongame Wildlife Program.
12. Encourage private landowner interest and concern for nongame resources by providing technical services relative to:
  - a) understanding and controlling nuisance wildlife situations
  - b) avoidance of actions which degrade wildlife habitat
  - c) mitigation of habitat loss
  - d) improvement of habitat including urban and backyard habitats and woodlots.
13. Clarify responsibility for promotion activities and delineate opportunities for cooperative efforts between the Bureau of Information and Education and the Nongame Wildlife Program.

## DATA ACQUISITION

Issue Statement: INFORMATION ON THE ECOLOGICAL AND ECONOMIC VALUES OF NONGAME SPECIES IS ESSENTIAL TO ADEQUATELY PRESERVE AND PROTECT THE NONGAME RESOURCE. DATA DESCRIBING DISTRIBUTION, STATUS, NATURAL HISTORY, AND UTILIZATION OF NONGAME SPECIES ARE NEEDED TO DETERMINE THESE VALUES.

Biological information on nongame species is incomplete. This shortage of knowledge results in inadequate understanding of the ecological value of these species, the needs of the resource, and the problems that may threaten the future availability of wildlife. Additional information on the economic and aesthetic value of many nongame species is also essential to adequately preserve and protect the nongame resource. Data describing the distribution, abundance, natural history, and utilization of species help determine the ecological and economic values by assessing species status, monitoring population and habitat trends, identifying management needs, and delineating citizen concerns and demands upon the resource.

Discussion: The principal charge of the Nongame Wildlife Program is to preserve and protect Minnesota's nongame wildlife resource. Successful implementation of this responsibility depends on adequately understanding the needs of the resource and the problems that confront its continued existence. In the absence of such knowledge it becomes impossible to design and implement actions that are necessary to insure the perpetuation of nongame species and the habitats on which they depend.

The problem is that data are either lacking or inadequate for most species. Certainly, the efforts of past investigators and amateurs have added substantially to our knowledge of Minnesota species. For example,

through the auspices of the Minnesota Ornithologists' Union, birding enthusiasts across the state are carefully delineating the distribution and abundance of nearly 400 bird species found in Minnesota.

In contrast, bats, snakes and countless other species that have less appeal, can be difficult to observe and often are plagued by myths and misconceptions. Studies documenting the distribution and abundance of these species have been undertaken by only a few individuals. Consequently, biologists are still attempting to document even the county occurrence of such relatively common species as the central newt, silver-haired bat and gopher snake.

Data on the historical distribution and abundance of species is equally important. By comparing past population levels with those at present, biologists can assess the current status of species and then focus research, inventory and management efforts on those species demonstrating significant declines. Historical data also establish a baseline against which future trends can be evaluated. Dr. T.S. Robert's (1932) treatise on Minnesota birds in the late 1800's and early 1900's is invaluable in this regard. Unfortunately, this type of information is rarely available for most other fauna.

Extensive knowledge of many species' life histories and habitat requirements is also lacking. These data are essential to understanding the animals' needs, habitat relationships, and capabilities for continued existence. Without it the resource manager is unable to specify management actions that may be necessary to preserve, enhance or restore species.

Three additional types of information are essential if the Nongame Wildlife Program is to responsibly preserve and protect the nongame resource. First, data on the current quantity and condition of various

habitats is needed to identify areas with substantial nongame resource values. At the same time, a system is needed which will monitor changes in habitat quality and quantity in order to identify significant trends in habitat availability which in turn may influence wildlife resource availability.

Secondly, information on the demands citizens place upon the nongame resource - both the species and their habitats - is needed. Documentation of wildlife-associated recreation at the national level (U.S. Dep. Inter. 1982b), has only recently focused upon both the consumptive and nonconsumptive user. Within Minnesota, the SCORP (State Comprehensive Outdoor Recreation Plan) data base attempts to summarize citizen demands for outdoor recreation at the state level but again, little emphasis is placed on general wildlife observation and enjoyment.

Thirdly, wildlife professionals need data on the economics of wildlife so that the values of the resource are recognized and protected in natural resource planning and land management decisions. The decision makers - legislators, government officials, the corporate community - all deal in and understand monetary values. When economic values for wildlife are established it will be possible to communicate more effectively with these people. That wildlife has value is not disputed. It is the extent of this value that must be delineated. Information on the positive economic value of wildlife in Minnesota has so far not been well documented.

The major cause for the lack of information is that traditional funding sources have not been available to support basic research and inventory on anything other than game species. Unfortunately, nongame species rarely benefit from research and inventory projects designed for game species. Monies recently available through Sec. 6 of the Endangered Species Act of

1973 have been inadequate, often difficult to obtain, and directed at federally listed endangered or threatened species. The NWP has received some Sec. 6 funds but the majority of monies coming to Minnesota have gone to support research and management of the timber wolf.

Cooperative agreements between the U.S. Fish and Wildlife Service and individual states with official lists of state endangered and threatened species provide additional funding for research and inventory work on State listed species. Minnesota developed its first official list of endangered and threatened species in 1984 and, therefore, has not yet been the recipient of any of these monies.

If efforts to acquire essential ecological and economic data are not taken, program staff, as well as other professional biologists, will be limited in their ability to address major resource issues that pertain to nongame wildlife. There are continuing demands to evaluate how proposed development projects may impact sensitive or critical species. Because of inadequate information, comments are frequently limited to very general observations based on the assumption of large-scale alterations to the habitat. The ability to suggest changes in a project that might mitigate negative impacts to species of concern is usually minimal. Nevertheless, numerous projects are reviewed each week.

This problem is further exacerbated by the fact that review and mitigation procedures for many proposed development projects are based on the USFWS Habitat Evaluation Procedures (HEP) (U.S. Dep. Inter. 1980). One of the key ingredients considered in the mitigation process delineated by HEP is the economic value of the resource. Until the ecological significance and/or citizen interest in species can be converted to economic values, potential opportunities to benefit the nongame resource are being

lost.

Decisions regarding acquisition and habitat management for nongame species are equally hampered by the absence of essential data. Habitat acquisition is considered an important tool in wildlife conservation but it can be expensive (see Wildlife Habitat Issue). Given the limited financial resources of state and federal natural resource agencies it is critical that the data necessary to make informed decisions are available. Once a tract that provides critical habitat for species is acquired, agencies may still lack the information they need to properly manage it for the species' benefit.

One of the principal objectives of the Minnesota Nongame Wildlife Program must be the development of an efficient and effective strategy to acquire essential resource data. Many other agencies and organizations also are committed to acquiring information on sensitive or critical nongame species and it is necessary that efforts be coordinated to avoid duplication and insure the most efficient use of limited funds.

Substantial efforts to resolve the various aspects of this issue already have been made by the Minnesota Department of Natural Resources as well as by other state, federal, county and private organizations. Since its inception in 1977, the Nongame Wildlife Program has emphasized the need for expanded inventory and field research projects. Prior to 1981, field efforts were directed at soliciting cooperation from volunteers across the state to report observations of uncommon wildlife species and to assist in inventories of special interest. Over the years, more than 170 volunteers had contributed 569 observations of uncommon nongame species (Henderson, 1979a). This system continues in operation today.

Emphasis also was placed on soliciting volunteer help to collect

distribution and abundance information on several conspicuous species of special interest: the Common Loon, Sandhill Crane and colonial waterbirds. The loon was chosen because of its public appeal and its sensitivity to human disturbance, changing water levels and nest site availability which make it a valuable indicator of Minnesota's aquatic environment. Over 2,500 loon observation cards have been submitted and transcribed into a computer file in the past five years. A thorough analysis of the information is scheduled for 1984. The data have served principally to help delineate the statewide distribution of summering loons (Henderson 1979b, Hirsch and Henderson 1980). The project, as currently designed, does not provide an effective or valid indication of population size or statewide nesting success.

The population of the Sandhill Cranes has declined precipitously in Minnesota during the century as new farm technology has made it more feasible to convert once marginal lands into productive farmland. These trends led to the initiation of another observation card program from 1977 through 1979 which documented the presence of two separate concentrations of cranes in the state and a seasonal shift in the cranes' utilization of different habitats (Henderson 1978).

Perhaps the most extensive inventory effort by the Nongame Wildlife Program to date has been the solicitation of data on Minnesota's colonial waterbirds - herons, egrets, cormorants, grebes, gulls and terns. All these species are of particular interest because of their visibility and because of their vulnerability to habitat destruction due to their habit of nesting in colonies. These factors led to the initiation of a statewide inventory of colonial waterbirds.

Private citizens and resource agency personnel submit records

documenting the location, size and species composition of known colonies. As of 1980, a total of 342 colonies (active and inactive) had been reported across the state (Henderson and Hirsch 1980). Three years later the data files contain records for 455 active and inactive colonies (Mn. Dep. Nat. Resour. 1984b). The increase is a reflection, primarily, of more intensive efforts to compile data on select species - particularly gulls. The location of all sites are mapped and coded in the Natural Heritage Program's database. Although it is not yet a complete survey of waterbirds, the project has served to carefully document the distribution, abundance and status of many species. Another major source of data on nongame species in Minnesota is the U.S. Fish and Wildlife Service's Breeding Bird Survey (Henderson 1984).

All of these projects have made important contributions to knowledge of the distribution and abundance of many nongame species. Yet, substantial improvements in each of these efforts are necessary if they are to continue an important aspect of the Nongame Wildlife Program's species inventory. Future project time must place a priority on evaluating and re-designing these efforts to improve the consistency in volunteer efforts and the statistical design of the surveys.

These inventory projects were the major focus of the early efforts of the Nongame Wildlife Program. Research, on the other hand, was limited prior to the availability of checkoff funds. Some federal monies were available to support an investigation of potential lead toxicity in Bald Eagles migrating through the Lac qui Parle Wildlife Management Area in west-central Minnesota (Hennes in prep., Bengtson in prep.).

Expanded nongame checkoff funds, first available during 1981, were used to support research on rock voles in Cook County (Daniels 1981), a statewide

amphibian survey (Nehl 1982), and a great gray owl nesting platform study (Loch 1982). The major effort with regard to research, however, was designing an expanded and comprehensive research and inventory program that began with the 1982 field season.

One important undertaking was the development of a small grants program. The objective was to establish a permanent funding source to encourage the initiation of inventory and research projects on Minnesota's nongame fauna. In 1982, twenty proposals were received. Nine proposals received full or partial support. In 1983, nineteen proposals were submitted and 10 received full or partial support. Twenty-eight proposals were received in 1984. Among the projects being funded are an investigation of the response of nongame birds to aspen management for Ruffed Grouse (Fouchi in prep.), the development of a guide to the study of amphibians and reptiles in Minnesota (Karns in prep.), and an investigation of the effects of prairie management on nesting birds (Johnson in prep.).

Also in 1982, the NWP, with advice from Minnesota's Endangered Species Technical Advisory Committee, initiated four major inventory and research projects focusing on species needing immediate attention. Among birds, the Piping Plover was most in need of attention. Proposed development at Duluth's Port Terminal threatened the survival of a population already at a dangerously low level. Furthermore, a small concentration of plovers at a site at Lake of the Woods (20 pairs) was in need of study because of its significance as the largest remaining population among the Great Lakes States. In 1982, a major research study on the plover population was initiated through a contract with researchers at the University of Minnesota. (Cuthbert and Wiens 1982, 1984). At the same time the Nongame Wildlife Program, in collaboration with the Arrowhead Regional Development

Commission, began monitoring and management work in Duluth Harbor designed to benefit both plovers and common terns (Met. Int. Comm. 1983).

The top priority among Minnesota's herpetofauna was the initiation of a study to delineate the distribution and abundance of Minnesota's rarest lizard, the Five-lined Skink (Eumeces fasciatus). Known from only a few collections near the town of Granite Falls, the Minnesota population appeared to be located several hundred miles from the main range of the species. An intensive one-year study was conducted in 1982 (Lang 1982, 1983).

Overall, occurrence data for many members of Minnesota's herptofauna is limited. Few accounts have been published since Reptiles and Amphibians in Minnesota was published (Breckenridge 1944). The Nongame Wildlife Program also contracted with Dr. Lang in 1983 to compile all the occurrence records since 1944. This was considered the first step leading to the eventual publication of a new account on Minnesota's reptiles and amphibians.

In 1981, two bat species were under consideration by the Endangered Species Technical Advisory Committee for inclusion on the state list - Keen's myotis and the eastern pipistrelle. Little was known about these and five other bat species native to Minnesota. To address this problem, a major three year study, focusing on a delineation of the distribution and abundance of bats in southeastern Minnesota, particularly winter hibernacula, was initiated (Birney in prep.). A second phase of the study which may begin in 1985 will focus on bats which are concentrated primarily in northern Minnesota.

Additional documentation of the occurrence of most nongame fish also was considered a priority. A major stream survey begun in 1971 and directed by the University of Minnesota, in collaboration with the Department's

Section of Fisheries, was designed to document the native fish fauna in Minnesota's riverine habitats, most of which are nongame species. Unfortunately, due to budget cuts in the late '70's, the project was prematurely terminated. The Nongame Wildlife Program, in collaboration with the Section of Fisheries, re-initiated this important project in the 1983 field season. Following a second field season in 1984, publication of an atlas of Minnesota fish is anticipated.

Major projects in 1984 include a field investigation of wood turtles (in cooperation with the Minnesota Chapter of The Nature Conservancy), design of a statewide frog survey, and an investigation of the habitat requirements of sensitive bird species in Minnesota's peatlands in cooperation with the Department's Division of Minerals.

The nongame wildlife resource is broad in scope and the Department of Natural Resources is not the only agency with responsibilities for its protection and preservation. Numerous federal, state and county agencies and private organizations also are directed by mandates pertaining to nongame wildlife. Perhaps the most prominent among these is the U.S. Fish and Wildlife Service. The Endangered Species Office of the USFWS has direct responsibility for coordinating activities pertaining to all federally listed species as well as candidates for federal listing. Another important activity of the U.S. Fish and Wildlife Service that pertains to the nongame resource is their resource planning effort (U.S. Dep. of Inter. 1983). As a part of this process, species of special emphasis have been designated at both the national and regional level. Several of the species, such as the Common Tern, Trumpeter Swan and Great Blue Heron, are of special interest to the State as well. The U.S. Fish and Wildlife Service has also sponsored studies on the economic values of wildlife and on citizen demand for

wildlife (Kellert 1980, U. S. Dep. Inter. 1982b). Specific and comprehensive information for Minnesota is not currently available however. Major efforts to monitor, inventory and conduct applied research on numerous nongame species by the North Central Forest Experiment Station and the Chippewa and Superior National Forests (U.S. Dep. of Agriculture, U.S. Forest Service) are also contributing to our knowledge of the Minnesota resource.

There is subsequently, a need to publicize the results of such studies among the public, governmental agencies, and legislators. There is also a need to incorporate the economic values of wildlife for use in cost/benefit analyses and mitigation assessments. Preliminary efforts in this regard are underway in conjunction with the Habitat Evaluation Procedure (HEP) of the U.S. Fish and Wildlife Service (U.S. Dept. of Inter. 1980).

At the state level, the Department's Division of Minerals has been very active in initiating major research and inventory projects on nongame wildlife. The Regional Copper-Nickel study spurred a myriad of resource studies within a nearly 600 square mile area (Minn. St. Plan. Agen. 1979). The potential for peat mining in north central Minnesota prompted other resource investigations during the late 1970's. Both projects have added substantially to the knowledge and understanding of natural resources in the northern half of the state. Some monies continue to be available to fund applied research pertaining to peatland reclamation and its implications for wildlife.

The Department's Division of Forestry also actively collects information pertinent to the nongame resource. The Division's Phase I and Phase II inventories of the State's forest resource are an important source of data on the distribution, quantity and quality of forest cover types.

When completed, Phase II may serve as a system for monitoring trends in forest habitat availability on public lands. For other habitats, no such monitoring system currently exists. The Natural Heritage Program's (Division of Fish and Wildlife) inventory of rare native plant communities, such as virgin mesic prairies, oak-savannas, and old-growth northern hardwoods is another valuable source of habitat data pertinent for nongame management. The Natural Heritage Program also maintains the computerized distribution records on the state's endangered, threatened and species concern species.

Numerous other groups within the Department of Natural Resources (e.g., the Division of Parks and Recreation, the Section of Ecological Services and the Section of Fisheries) as well as other state agencies (e.g., the Department of Transportation, the Minnesota Pollution Control Agency and the Minnesota Zoo) also are involved in projects or concerns that in many instances provide information on the nongame resource (Mn. Dep. Nat. Resourc. 1983b). For example, the Minnesota Land Management Information Center within the State Planning Agency maintains a data base of general land use and natural resource data - the Minnesota Land Management Information System (MLMIS).

Notable among county efforts is that by the Hennepin County Park Reserve District. Inventory and species restoration projects at each of their large preserves in the seven county metropolitan area have added significantly to understanding the resource in this area.

Private and/or non-profit conservation groups as well as public institutions are important groups whose actions may be aimed directly at helping to resolve the need for more data. Most active among the private groups have been the Minnesota Chapter of The Nature Conservancy. They have been involved with habitat acquisition for rare or sensitive species but

recently have moved in the direction of species restoration and inventory efforts as well.

Private conservation groups such as the Minnesota Audubon Council, the Minnesota Ornithologists' Union and, most recently, the Minnesota Herpetological Society, are also important in promoting interest in and knowledge of the nongame resource. Among public institutions, the numerous state universities and colleges, as well as the Bell Museum of Natural History and the Science Museum of Minnesota, are all important groups addressing this issue.

Certainly the progress made in resolving this issue, particularly since checkoff funds became available, has been substantial. Nevertheless, the tasks that remain are numerous.

With over 400 species of vertebrate nongame species alone for which the NWP is responsible, four points become immediately clear. First, the NWP cannot possibly collect pertinent data on all the species. Staff and revenue are limited resources and need to be directed towards the most critical wildlife resources first. Because field research and inventory projects are costly, a method needs to be instituted to establish priorities for research in balance with other Program functions. Secondly, the issue and problem of inadequate data is not exclusive to the Nongame Wildlife Program. It impedes the progress of numerous agencies and organizations charged with conserving the wildlife resource. Because of the financial and personnel constraints that limit each group's actions, it is essential that all cooperate in efforts to generate the necessary information. Thirdly, research efforts should, in part, be applied and designed to identify and/or test management techniques. Fourth, research results must be published so that information is available for use by all people interested in its

application.

An effort to establish species priorities in the Nongame Wildlife Program has begun. The top priority is the Department's legal responsibility to protect those nongame species on Minnesota's official list of endangered, threatened and special concern species. Nearly two years of work by the Endangered Species Technical Advisory Committee, comprised of some of the most knowledgeable experts in the State, went into the development of this list.(Mn. Dep. Nat. Resour. 1983c). The result is a list of Minnesota species in the critical need of attention. Studies of the piping plover, five-lined skink, bats and wood turtles have all been selected because of their state status. Work on these and other listed species will continue.

Beyond a consideration of endangered and threatened species, all agencies and organizations are confronted with a problem of selecting priority species. In the past few years several attempts have been made to design an objective system to assist in the decision-making process (Neimi 1982). All the methods share several features including an assessment of a species' current abundance, historical abundance, general distribution, degree of threat and critical needs.

Other agencies or organizations have included non-biological criteria as well, evaluating components of the species' public appeal and economic value (Landry 1979, N.D. Game and Fish 1982, Nye 1981). These and other methods should be reviewed and evaluated by the Minnesota Nongame Wildlife Program with the goal of selecting or developing a system for Minnesota to aid program personnel select additional species of special emphasis.

In addition to selecting additional species for emphasis it is important that some measures are taken to monitor species. Without baseline

data that reflects general population trends, it is impossible to select priorities. It has been stated that "a nongame program that provides for continual monitoring of the nongame resource is by far the best endangered species program a state can have." (Odum 1982).

Some established monitoring devices are already available, for example Christmas Bird Counts and U.S. Fish and Wildlife Service Breeding Bird Survey Routes. These alone may not be sufficient for birds. Monitoring methodology is currently not available for small mammals, reptiles, amphibians or fish. Establishment of periodic surveys may not be the only means of monitoring these species. Monitoring the "health" and/or availability of the habitats they depend on, or selecting indicator species, also are possibilities. The challenge ahead is to decide what to monitor and how to most efficiently and effectively accomplish the monitoring.

In addition to selecting species priorities and baseline monitoring techniques, the NWP needs to review the major habitat management actions that are currently employed in Minnesota and assess their impacts or benefits to the nongame wildlife resource. For example, both forest management and wetland management practices are widely applied. How do they affect nongame wildlife? If they result in negative impacts to sensitive or critical species, how can those impacts be lessened?

The NWP also needs to ask what priorities are being developed by other agencies and how it can most effectively cooperate to attain similar goals. A broader discussion of this need is discussed in the Coordination Issue.

Opportunities to Resolve the Issue:

1. The NWP should encourage and coordinate with other agencies, organizations or individuals conducting research or compiling data on nongame species or on matters of concern to the nongame

resource.

2. Identify the most effective and efficient combination of manpower and dollars available to conduct the studies and implement the findings.
3. Seek guidance from other state agencies, the U.S. Fish and Wildlife Service and other organizations on the most effective survey, census and monitoring procedures and where practical coordinate programs to avoid duplication of effort.
4. Remain informed regarding all field nongame studies being conducted in Minnesota.
5. Develop guidelines and procedures which define priority species and management activities.
6. Design and implement inventory and monitoring programs to provide baseline data for determinations of status or management needs of species of concern in Minnesota.
7. Encourage modification of Phase I and Phase II inventories to provide more useful wildlife habitat data.
8. Participate in the State Planning Agency's update of MLMIS land use data base to assure that information on statewide habitat will be available.
9. Formulate programs of applied research to examine effects of various land management practices or natural resource utilization programs on nongame species and their habitats.
10. In cooperation with other agencies, initiate and fund more forestry and wildlife research projects on the long-term effects of timber and game management on forest ecosystems.
11. Every effort should be made to publish findings in both a

professional and popular manner as appropriate.

12. See opportunity 13 on page 18.

## DATA MANAGEMENT

Issue Statement: NONGAME SPECIES INFORMATION MANAGEMENT AND NONGAME WILDLIFE PROGRAM ADMINISTRATION REQUIRE A COHESIVE AND ACCESSIBLE DATA SYSTEM COMPATIBLE WITH OTHER NATURAL RESOURCE DATA BASES.

Coincident with the Nongame Wildlife Program's mandate to preserve and protect the nongame resource is the need to efficiently manage information. Pertinent biological and economic data describing the resource must be well-organized and readily accessible to the public and resource managers in order to enhance their capability to make informed decisions. Equally important is the need to properly manage information describing the financial and personnel resources of the NWP to insure that Nongame Wildlife Program goals are attained in the most efficient and effective manner possible.

Discussion: There are three major aspects to the issue of information management. First and perhaps most obvious is the short-term need to address how the Nongame Wildlife Program should manage data that it already has acquired. Over the past few years, several projects to gather information describing the distribution and abundance of numerous nongame species have been initiated (See Data Acquisition Issue). The green slip observation card program, the colonial waterbird survey and the Common Loon survey are all efforts in this direction. Until recently, most of these data were organized and maintained in manual files. When the Nongame Wildlife Program was initiated in 1977, a manual system of organization was expedient and sufficient. Before long, however, literally hundreds of records began to accumulate and efforts to keep them all efficiently

organized and accessible became difficult. Wide-ranging support from numerous volunteers (including private individuals and state and federal agency personnel) to conduct a variety of field surveys helped to increase the bank of biological resource data in the early years of the program. Shortly thereafter, the Nongame Wildlife Program experienced exponential growth when the tax checkoff legislation was passed. The increase in funding revenues made available through the checkoff fund made it possible to hire six new staff. Four of these new positions are now located in field offices outstate where they spend a significant amount of time conducting survey work, thereby generating additional new data. The Nongame Wildlife Program's efforts to manage, analyze, interpret, summarize and disseminate resource information has not kept pace with its ability to gather new data.

The question of how to manage data that the Program already has acquired applies equally well to administrative information, for example incoming revenues, expenditures and time commitments of staff personnel. An annual budget of \$600,000 seems considerable, yet is relatively small considering the broad scope of the Nongame Wildlife Program's responsibilities. In order to make wise decisions regarding the proper allocation of monies and personnel, staff must have the capability to evaluate both the direct and indirect costs of program actions. Furthermore, what is the cost benefit to the resource realized by a project? The ability to determine these values is essential to the long-term operation of the Nongame Wildlife Program. Much of this information already is available in a variety of formats but now needs to be compiled and organized in a manner that will facilitate decision-making.

The second major aspect of the issue of information management is a long-term need to consider how the Nongame Wildlife Program will manage data

that will be acquired as a consequence of developing new inventory and research projects. In many respects, addressing this long-term need is preferable to addressing the short-term need of managing information already on hand. Because an important aspect of designing field projects is taking into account how the data will be summarized and interpreted, such considerations can and should influence project design. Initially incorporating these concerns enhances the overall utility and quality of research or inventory efforts. When these considerations are not taken into account many unnecessary constraints may be imposed on the Program's ability to properly manage the information at a later date.

The Nongame Wildlife Program's colonial waterbird survey exemplifies this problem. Since it began collecting data in 1977, information on over 450 nesting sites has been gathered, both from field records and published accounts. More than five years of data is available for many of these sites, including counts or estimates of active nests and breeding pairs for each species nesting in the colony. Currently all this information is maintained in extensive manual files that continue to grow. Furthermore, the data itself is plagued with numerous reporting inconsistencies, caused in part by inadequate instructions and standards for conducting the surveys. Such problems have made it extremely difficult to either analyze, summarize or computerize the information. Efforts are now underway to develop an information management system designed to efficiently handle this data base. Because of these types of problems, it is essential that the Nongame Program consider data management needs in conjunction with developing long-range strategies to address the Issue on Data Acquisition.

Finally, the third aspect of this issue is the need for the Nongame Wildlife Program to develop a system compatible with other computerized data

bases (MLMIS, Phase I and Phase II inventories) and with secondary sources of resource information that other investigators have collected or are now in the process of collecting. Considerable information already is available on many nongame species, often in published reports and journals. It is a major task to sort through and compile sources that are pertinent to a knowledge and understanding of the resource. For example, numerous computerized library search services are now available to aid in this process. Despite the availability of such services and their potential value, it is essential that the Nongame Wildlife Program first understand what information is needed and, consequently, how it will be managed. The same holds true for resource data currently being collected by other agencies and institutions. Should the Nongame Wildlife Program serve as a repository that will centralize statewide nongame resource information? Or, instead, should the Program only serve its own information management needs and refer inquiries regarding data that the Program doesn't maintain to other resource people? An important factor in selecting the appropriate strategy is to assess not only the needs of the Nongame Wildlife Program regarding resource data but the needs of the entire Division of Fish and Wildlife and other Divisions within the Department as well.

Some preliminary steps already have been taken toward resolution of this issue. Perhaps the most significant action has been the incorporation of select nongame wildlife resource data into the Minnesota Natural Heritage Program's data base. The Natural Heritage data base is an integrated system of map, manual, and computer files designed to catalog individual occurrences of rare species and natural features throughout the state. The files grew from the recognition that there was a need to develop and maintain a centralized source of ecological information. Such a data base,

it was felt, would help insure that important natural areas were protected and that public and private development projects would have the most up-to-date information available from which to plan.

The Minnesota Natural Heritage Program was established in January 1979, as a cooperative effort between The Nature Conservancy and The Minnesota Department of Natural Resources. Now one of 35 state Natural Heritage Programs, it has become permanently established within the Department's Division of Fish and Wildlife. Data that the Nongame Wildlife Program had collected describing the location, status and approximate size of over 450 heron colonies in the state are catalogued in the computer and map files of the data base (details regarding the number of nesting pairs per species each year in the colony are maintained manually), as is occurrence information on nearly all of the currently listed state endangered, threatened, and special concern wildlife species. The cooperative transfer of data between the Nongame Wildlife and Natural Heritage Programs progressed to the point that in 1981 the Nongame Wildlife Program incorporated the Heritage Zoologist position onto its full-time staff. One of the primary responsibilities of the zoologist position is to insure that information on rare nongame species catalogued in the Natural Heritage data base is continually maintained and up-dated.

Despite its ability to effectively manage important data for some rare species and natural features, the Heritage data base does not provide a solution to all the data management needs of the Nongame Wildlife Program. Because it is a geographic-based information system it is limited to efficiently cataloguing geographic information describing a species' occurrence, (e.g., the section township, and range). Detailed information describing the historical distribution, reproductive success, as annual

population size of a species, cannot be efficiently managed by the data system. For example, data describing the geographic location of each waterbird colony has been added to the Heritage information system. However, the extensive data describing the species composition and nesting success in each colony are incompatible with the data base. A new system will be developed that permits efficient organization, retrieval and analysis of the information. There is a similar problem with data collected from the volunteer observation program for Common Loons. An assortment of information describing the presence or absence of loons on a lake, their nesting success and factors that may disturb the birds also are incompatible with the Heritage data base and now are coded into a data file specifically for loons.

Another general need that is not met by the Natural Heritage data base is management of information summarizing habitat requirements, food habits, population dynamics, state and national distribution, etc. for both common and rare species. Although the statewide distribution data for rare species is effectively organized by the Heritage system, the data base is extremely cumbersome for use with common species. The first challenge that confronts the Nongame Wildlife Program is to assess which of these data are important to maintain in a data system. Discussion of the importance of carefully assessing this need was presented in the Data Acquisition Issue.

In the past 10-15 years numerous data management information systems for wildlife have been developed. Perhaps the one most widely in use today is the "Procedure for Describing Fish and Wildlife", designed by the Eastern Energy and Land Use Team of the U.S. Fish and Wildlife Service. Procedure provides a method for organizing and describing state fish and wildlife information in a standard, consistent manner. Information describing each

species taxonomy, distribution, legal status, habitat associations, food habits, management needs as well as a wide variety of other data are coded into the files. The entire system is designed to provide a readily retrievable source of up-to-date information for project planners, permit reviewers, resource managers, administrators, regulators and researchers.

In 1980, the Nongame Wildlife Program initiated development of the Procedure data base in Minnesota. Monies to support the work were provided through cooperative agreements with the U.S. Forest Service and the U.S. Fish and Wildlife Service. One full-time staff position was added to the program and funds were ear-marked for individual contractors. By the fall of 1982, however, further work was halted for several reasons. The foremost consideration was the rapid changes that were occurring in the Nongame Wildlife Program as a consequence of the new source of revenue. Coincident with this was the recognition that the Nongame Wildlife Program had some very specific data management needs (e.g., for colonial waterbirds and loons) that were a high priority but for which the Procedure data base was not a solution. Furthermore, the expense of developing the data base into a useful decision-making tool, with accurate and current information, was high.

Although the decision was made not to pursue development of the Procedure data base, the experience gave the Nongame Wildlife Program an opportunity to work with a computerized data base learning both its advantages and disadvantages. If, in the future, development of a comprehensive data system is deemed a priority, "A Procedure for Describing Fish and Wildlife" should again be considered if it meets the needs of the Program and other potential users in the state and federal agencies. Again, the most important point is that the Nongame Wildlife Program first

carefully delineate its data management needs.

Finally, actions necessary to resolve the administrative aspects of data management are still very preliminary. Only recently has this been recognized as an important part of program management. At present, nongame staff are recording the amount of time they spend each day on different program functions, such as public education, extension, survey and technical projects. A cost-accounting code also has been developed so that each program expenditure can also be coded to a particular function. Within the coming year it should be possible to generate an accurate monthly report of each of the program's project costs.

The challenge that lies ahead for the Nongame Wildlife Program is to establish an information management system that will provide support for all of the program's functions, including resource management and strategic planning. Fundamental to the establishment of this system is the need to answer the simple question: "What information is needed and why?" The answer will help determine the most appropriate means of data management.

Opportunities to Resolve the Issue:

1. An independently conducted Division-wide assessment of the need for computerized data management systems, including the needs of the Nongame Wildlife Program and the Natural Heritage Program would enhance the integration and coordination of such systems. Such an assessment should include input from USFWS and USFS.
2. The Wildlife/Forestry Task Force and the Bureau of Management Systems should be requested to assist in the assessment and development of the Program's data management needs.
3. Define a mechanism for incorporating newly compiled field data into the DNR environmental review process and the administrative,

legislative or management actions of appropriate public or private organizations.

4. Investigate the mechanisms and effectiveness of data management systems developed and existing outside the Division but within the state (Bell Museum of Natural History) or in other wildlife management agencies around the nation.
  - a) MAST systems - U.S. Fish and Wildlife Service.
  - b) Data star and report systems of Montana.
  - c) Forplan - U.S. Forest Service.
5. Insure that data management system selected is compatible with existing data systems within the DNR.

## ENDANGERED AND THREATENED SPECIES

Issue Statement: SOME OF MINNESOTA'S NATIVE SPECIES HAVE DECLINED IN NUMBER AND DISTRIBUTION AND ARE EXTIRPATED, ENDANGERED, THREATENED OR OF SPECIAL CONCERN. THERE IS A NEED TO IDENTIFY AND CONSERVE VIABLE POPULATIONS OF THESE SPECIES.

Minnesotans' desire to maintain viable populations of all wildlife is reflected in Minnesota's statutes to protect endangered and threatened species. Facilitating the recovery of extirpated, threatened and endangered species and preventing the decline of populations of nongame species is considered by many to be the first priority of the Nongame Wildlife Program. An effective program to recognize, monitor, manage, protect and/or restore these species is needed to maintain Minnesota's natural diversity.

Discussion: Managing rare species is an important component of responsible and balanced natural resource management. The federal government initiated both recognition and protection for endangered species through legislation developed in the late 1960's which culminated in the Endangered Species Act of 1973. The stated purpose of the Act is to provide a program for the conservation of endangered species and to protect the ecosystems upon which they depend. The cause of the endangered species problem is recognized as the result of economic growth and development proceeding with no consideration of the consequences to wildlife (Langer 1984).

Additionally, the federal law (Sec. 6) authorizes the establishment of cooperative agreements between state wildlife agencies and the U.S. Fish and Wildlife Service for cost-share funding for management of federally listed species, provided that the state can show that it has an "adequate and active program" for the conservation of endangered and threatened species.

The purpose of these Sec.6 grants is to create incentives for states to increase efforts that lead to maintaining the national diversity of species (Langer 1984).

Following the federal example, Minnesota established legislation mandating state protection for endangered species in 1971 and entered into a cooperative agreement for endangered animals in 1979. Minnesota's statute (97.488 Protection of Threatened and Endangered Species) has been revised twice, once in 1974 and again in 1981.

The state legislation designates the Commissioner of the Department of Natural Resources as the responsible agent for the identification and management of Minnesota's endangered and threatened species. In addition, a Commissioner's Order (No. 1901) regulating the taking, possession and disposal of endangered species was developed in 1974 and is currently being revised to reflect legislative changes made in 1981. This order serves as the Commissioner's policy executing the legislative mandate to designate and manage Minnesota's endangered and threatened species.

Minnesota's law protects both plants and animals in one of three categories - endangered, threatened or special concern. The law provides that designation of species within these categories shall be accomplished through a listing process including public review, and that the designated species list shall be reevaluated every three years. This listing process is similar to designated procedures mandated under federal law.

The state law further provides that a volunteer technical committee of up to 30 individuals be appointed to assist in the establishment of this list and to make recommendations to the Commissioner of Natural Resources regarding restoration, recovery, habitat improvement and habitat protection for designated species. The Commissioner is authorized to develop

management programs that may include research, census, law enforcement, habitat acquisition and maintenance, propagation, live-trapping, transportation, and regulated taking. Finally, the law also permits exceptions to acts otherwise prohibited. It is these exceptions which fail to protect endangered species habitats that are the reason why Minnesota could not qualify for an unlimited endangered/threatened plant cooperative agreement between the state and the federal government.

The first list of designated species became official in January 1984. It was developed by personnel of the Natural Heritage and Nongame Wildlife Programs working closely with the 30-member Endangered Species Technical Advisory Committee. A total of 287 native plants and animals have been listed: 57 species as endangered, 49 species as threatened and 181 species as special concern (Mn. Dep. Nat. Resour. 1983).

The establishment of a state list is a great step forward. The educational value of such a list is one of its most significant benefits. A state list acts as an early warning system, alerting natural resource managers and the public that certain species and the habitats they depend on are experiencing problems. These problems can then be addressed at a state level before they become of concern at the national level. In this manner, the list serves as a critical guide for establishing priorities for both state and private management activities and conservation efforts.

Preventing the decline of populations of native species is seen by many as the first priority of wildlife management. It is certainly less expensive than subsequently attempting to restore populations of depleted species. Within the DNR, the Section of Wildlife coordinates the endangered species management effort. The Natural Heritage Program (with staff botanists) and the Nongame Wildlife Program (with a staff zoologist)

together maintain a computer-based data system on rare species in Minnesota. Staff scientists from all three programs are working to integrate the management needs of these species into ongoing practices of the Divisions of Fish and Wildlife, Forestry, Parks and Recreation and other agencies.

To date, the responsibility for developing a comprehensive strategy to conserve endangered species has not been assigned nor have the scope and goals of such an effort been defined. As these matters are addressed, it will be important to evaluate the efforts of others outside the DNR, including the Endangered Species Office of the U.S. Fish and Wildlife Service, the Sensitive Species Programs of the Chippewa and Superior Forests and the efforts of conservation groups such as The Nature Conservancy. The recent evaluation by Langer (1984) of endangered species conservation efforts in the upper Midwest has already developed much useful information in this regard.

The process of identifying endangered and threatened species has already been established by legislative mandate. The issue facing the NWP is, therefore, one of determining how it can most effectively focus its activities to accomplish the inventory, monitoring, management or recovery needed by these listed species. Where should the NWP's emphasis be placed, particularly with regard to the efforts being expended by other groups and agencies? The formal system developed to guide allocation decisions at the federal level for both the recovery and listing of species may serve as a model for priority establishment.

Opportunities to Resolve the Issue:

1. Assign responsibility for coordination of the Department's endangered species effort including the definition of goals and scope of DNR's commitment to endangered species

management.

2. Develop a new Commissioner's Order that establishes DNR's policy relating to the interpretation of the revised Endangered Species Statute.
3. Promote awareness and appreciation of listed species among other agency personnel and the general public, especially private landowners. Encourage understanding of causes for these species' declines and the remedial actions needed to restore populations.
4. Develop a scheme of priorities that identifies groups of species or habitats needing attention. Cooperatively address these needs with other agencies which are similarly mandated to protect and manage these species.
5. Monitor and manage species in order to prevent future declines and the listing of additional threatened or endangered species.
6. Adopt cooperative agreements with nongame programs in adjacent states to manage endangered, threatened or special concern species.
7. Develop Program actions which initiate or support qualified projects for the propagation, management, rehabilitation or recovery of declining or extirpated species.
8. Identify and implement legislative or policy changes needed to enable the State to qualify for a cooperative agreement for plants.
9. Identify species which are in need of restoration, assess the feasibility and priority of such restoration and develop a long-term strategy for such actions.

## WILDLIFE HABITAT

Issue Statement: THE MAINTENANCE AND PERPETUATION OF VIABLE WILDLIFE POPULATIONS IS JEOPARDIZED BY THE CONVERSION, DEGRADATION, FRAGMENTATION, AND CONTAMINATION OF WILDLIFE HABITAT.

Habitat protection has been a long standing issue and many agencies are involved in its resolution. To maintain and enhance representative and unique habitats for all wildlife species, there is a need to sustain existing habitat management and protection programs and implement new actions that recognize nongame resource needs and continue to minimize the adverse effects of land use on wildlife habitats.

Discussion: Minnesota's position in the heart of the continent where three major biomes converge endows the state with a wide variety of wildlife habitats. Consequently, wildlife species diversity is unparalleled in the upper Midwest. Man's use of the lands and natural resources of the state have altered these habitats, creating many of the present problems in wildlife conservation, particularly habitat preservation. The specific land use actions and their consequences for the wildlife resource in Minnesota have previously been discussed (Mn. Dep. Nat. Resour. 1983b).

In Minnesota, certain wildlife habitat types are at the present time better protected than other types because of their location in the state or because of their value for certain wildlife species. The peat bogs of the north and prairie potholes of the west illustrate these situations. The peat bogs remain largely intact because attempts to convert them for agricultural use failed due to cold climatic conditions and saturated soils. Prairie potholes, though greatly diminished in numbers and acreage, remain a sizeable habitat component in

Minnesota because of concerted acquisition programs on the part of the state and federal government to protect habitat for waterfowl resulted in the protection of a sizeable remnant of this more extensive habitat type. Many other habitat types, however, have been almost totally converted to other uses or lost because of management practices on private and public lands. For example, native prairie has been converted to agricultural land in the south central and southeastern part of the state with vestiges remaining for the most part only on railroad rights-of-way. In southwestern and northwestern Minnesota, native prairie habitat may still be found as isolated parcels on the beach ridges or rougher land where droughty soils and topography offer limited potential for cropping. However, intensive grazing of these areas has severely degraded the native prairie plant communities reducing their utilization by wildlife. On the wetter soils associated with northwestern Minnesota, the development of a strict fire prevention and suppression program has caused remnant prairie habitats to succeed to aspen and brush thickets.

All wildlife has suffered because of such conversion, degradation and fragmentation of habitats. Certain prairie species which once commonly occurred across the prairie biome now only persist in northwestern Minnesota. The marbled godwit and prairie chicken are gone from the southern Minnesota prairies due to a lack of prairie parcels of sufficient size or because the plant community structure has changed due to livestock grazing. Other species such as the piping plover, a bird requiring extensive sand beaches, have declined because their habitat has been preempted by recreational use, lake shore cabins, industrial activities, and other non-compatible activities.

Historically, habitat protection for wildlife consisted of land acquisition. The establishment of federal and state forests for timber management were among the first major actions which resulted, secondarily, in the protection of

wildlife habitat. This habitat component, primarily in the northern part of the state, remains in public ownership today though the composition of the original forest communities has greatly changed.

The next significant land acquisition effort, this time specifically on behalf of wildlife, involved the acquisition of fee and easement ownerships of prairie marshes in western Minnesota through the Section of Wildlife's "Save the Wetlands Program" and by the U.S. Fish and Wildlife Service for Waterfowl Production Areas and national wildlife refuges. Though acquisition was specific for waterfowl, the network of protected wetlands and adjacent uplands has resulted in the perpetuation of numerous nongame species which otherwise would have been lost. Some wildlife species were lost when the habitat preserved did not meet the critical size necessary to continue viable breeding populations or did not contain all of the habitat characteristics necessary for a particular species. Subsequently, statewide protection of wildlife habitat through land acquisition was initiated by the DNR's Section of Wildlife. While the primary focus continues to be wetland protection, critical habitats for other wildlife are also being acquired.

Smaller efforts, focusing primarily on acquiring critical and disappearing lands for the purpose of protecting plant communities (habitats) were initiated in the mid 1960's and '70's. These efforts on the part of private nonprofit organizations such as The Nature Conservancy resulted in the protection of substantial acreages of native prairie habitat. Though the primary focus was protection of plant communities, the end result was also protection of wildlife habitat. Recent refinements in overall objectives by this organization and efforts by programs such as the DNR's Natural Heritage and Scientific and Natural Area Programs have resulted in the identification and acquisition of habitats critical to certain nongame species, plant species, and plant communities ranked

as statewide priorities.

Four areas of value primarily for nongame species have been protected through public ownership as a result of efforts by NWP personnel with the cooperative financial and administrative assistance from the Division of Fish and Wildlife's Game and Fish Fund, the Natural Heritage and Scientific and Natural Areas Programs, the Wildlife Heritage Foundation, and The Nature Conservancy. The Howard Lake heronry on Lamprey Pass WMA (Anoka Co.), Shelley Island in Cotton Lake (Becker Co.), and the common tern and piping plover nesting habitat on Harding Island (Duluth Harbor, St. Louis Co.) are consequently now administered as wildlife management areas. Pine and Curry Islands in Lake of the Woods are administered as a Scientific and Natural Area, a designation attributable to their utilization for nesting by the endangered piping plover.

Nongame Wildlife Program personnel have evaluated numerous other parcels for nongame resource values and as potential acquisitions. Alternative measures have been implemented to protect the wildlife values on some of these tracts such as Egret Island now owned by The Nature Conservancy and Long Lake heronry posted by the DNR under landowner easement to prohibit trespass during the nesting season.

Today there are approximately 12 million acres of public land in Minnesota. Located predominantly in the northern part of the state, most of this property came into public ownership as a result of congressional land grants, extensive tax forfeitures, and the establishment of national forests in Minnesota. Approximately 965,000 acres of wetlands, located from southwestern Minnesota north to the Canadian border, represent the single largest acreage of acquired lands. This acquisition effort was possible because of dedicated funds derived from federal duck stamp monies and state small game hunting license surcharge and cigarette tax monies.

Other public land acquisition in Minnesota has been primarily for state

parks, national and state forests, or for specific recreational activities. At the state level the public acquisition of lands for other than wildlife purposes was quite limited until 1975. At that time a public bonding program (Resource 2000) was implemented to fund the acquisition of lands for all important natural resource purposes. The Resource 2000 program has accelerated the acquisition of natural resource lands for wildlife habitat purposes. This effort has also refueled the controversy over public land ownership in Minnesota.

As a result of the concern over public land ownership, the most recent legislation (Chapter 344, Session laws of 1982) authorizing the expenditures of bonding monies for land acquisition requires that existing state land, equivalent in acreage to the amount acquired, must be offered for sale. This type of legislation is based on an aversion to existing state land ownership and additional acquisition on the part of some legislators and some of their constituents.

Acquisition has not been the only alternative for protecting wildlife habitat. The U.S. Fish and Wildlife Service protects some wetlands through an easement program. Legislative actions such as tax credits for native prairie and wetlands have postponed the destruction of certain wildlife habitats by plowing and draining, at least for the time being. In addition, the waterbank program administered by the DNR has set aside wetlands through ten year easement agreements.

Similarly, new laws regulating the discharge of toxic substances into the water, air, and land, while most times not targeted to perpetuate wildlife habitat, have the effect of limiting negative impacts to remaining wildlife habitats. The exercising of State regulatory authority over water appropriations and over wetland drainage has also benefited wetland wildlife. National and state legislation mandating assessment of the environmental consequences of major

development actions has been an innovative mechanism used to protect wildlife habitat when information is available to identify a site's significance for endangered, threatened and other wildlife resources. Too often, however, sufficient information on a specific site does not exist to assure comprehensive evaluation and consideration of its values for wildlife (See Issue on Data Acquisition).

The management of public lands is an important activity of tremendous consequence to wildlife habitat and hence to nongame species. As noted in Volume II, state, federal, and some county governments employ professional managers whose sole purpose is the maintenance and enhancement of wildlife habitat. For the most part, these efforts have been directed to wildlife habitat enhancement within the constraints of state, federal, and county objectives relative to deriving economic returns from the vast majority of public lands (county, state, and federal forests). Such economic returns historically have been viewed as coming from timber resources, mineral resources, recreational activities and other resource commodities such as peat. When wildlife enhancement on these lands was incorporated into forest management or other land use plans, it traditionally has been for game species. In the past, the management orientation on lands acquired specifically for wildlife habitat has also been primarily to benefit game species.

Many nongame species have benefited from management actions carried out on public lands for forestry or traditional wildlife objectives. However, actions directed to game species have probably also had negative impacts on other nongame species because of the traditional emphasis placed on increasing edge and setting back successional stages of community types.

This emphasis has shifted within the last 25 years as federal lands have come under comprehensive legal mandates to consider all wildlife needs as an

important part of the forest management thrust. Similarly, in the last few years, state forest land managers have developed comprehensive procedures to build wildlife needs (including nongame) into the states traditional land management programs (Mn. Dep. Nat. Resour. 1982b). Some county land management programs have hired professional wildlife personnel to give wildlife increasing emphasis in land management programs. The potential of such a comprehensive approach for the enhancement of wildlife habitat is vast and the progress to date has been encouraging. Specific management activities undertaken by NWP personnel and Department land managers to benefit nongame species have included such actions as the establishment of bluebird house trails, nest platforms to restore a great blue heron rookery, prairie burning, and the creation and protection of nest sites for piping plovers and common terns.

The maintenance and enhancement of wildlife habitat is also facing numerous indirect threats to its existence. Degradation of specific habitats such as northern softwater lakes from acid precipitation continues at an accelerating rate. The limited remaining habitats in the major agricultural zones are subjected to exposure to large amounts of pesticides, herbicides, and other toxic substances. Ground water in Minnesota, especially in the southern part of the state, is becoming increasingly contaminated with unknown consequences for wildlife resources. Lead shot contamination, with its dire consequences to waterfowl, birds of prey and other wildlife, continues to negatively impact wildlife resources while the need for national regulatory mechanisms to deal with it are downplayed. The relatively indiscriminate application of herbicides for weed control on land and water, and pesticide spraying for nuisances like mosquitoes annually take their toll on wildlife directly or through contamination of the food chain and wildlife habitats. Exotic species, such as purple loosestrife, a European plant species, pose additional threats to certain

wildlife habitats. All of these threats are interrelated and cumulative. They are also technically complex and/or are politically sensitive because they involve important economic issues and/or human health and welfare considerations.

Despite existing state and federal land use restrictions, environmental considerations and standards, and habitat acquisition programs, increasing amounts of wildlife habitat are degraded, lost or altered without consideration for wildlife species. Though public agencies can exercise more control over activities on public lands, it is the private land base (75% of the total) where the least control occurs. Consequently, active habitat management on public lands and the continued acquisition of additional wildlife habitat, though critical, will only go part way toward providing for the optimum in wildlife habitat. Other alternatives such as comprehensive local land use zoning and planning, new legislative regulations, increased enforcement, landowner education, tax incentives, and private land management programs need to be identified, developed, and pursued. Cooperation with other county, state and federal programs needs to be strengthened and policies and guidelines need to be adopted for the management of public lands consistent with enhancing the future for wildlife species.

Finally, an ignorance of the possible economic value of wildlife also contributes to habitat loss, degradation, and conversion for other purposes. Admittedly, powerful economic forces are at work on private landowners, especially in the agricultural zone. As a result, many of these landowners will not be able to give consideration to wildlife. However, by being able to present wildlife in a favorable economic light, managers might provide just enough incentive to sway some landowners' attitudes.

A review of the Nongame Wildlife Program's past acquisition and habitat management accomplishments reveals a number of important considerations which

must be addressed as the Program develops a strategy to effectively contribute to the efforts to maintain and enhance wildlife habitat. The Nongame Wildlife Program itself cannot, nor should it be expected to acquire all parcels of significance to the nongame resource in Minnesota. Given existing acquisition programs, perhaps other DNR programs, federal agencies or private organizations will acquire land necessary for the nongame resource. The most important role of the NWP relative to habitat protection may be to define the habitat needs of priority nongame species, identify sites which require protection, and subsequently refer them to others for protection in the public interest. Perhaps the Program's role should be to answer basic questions on the needs of rare species such as minimum acreage requirements, etc. and to provide assistance with equipment, personnel, and money to see that all wildlife habitat is managed to enhance nongame species. The impact the NWP could have in enhancing and protecting habitat for nongame species may be greater if it concentrates on providing this technical and management assistance to existing land acquisition programs and land management agencies.

The NWP needs to assess where the opportunity for significant improvement of habitat management and protection lies (on public or private lands) and where the Programs' efforts should be focused. For instance, are current nongame wildlife conservation efforts (including the NWP) paying enough attention to private habitat loss and degradation activities? The NWP needs to determine how it can contribute on private lands relative to past wildlife habitat accomplishments and the current activities of the Section of Wildlife and other agencies. What percent of money and time should be devoted to such efforts given that there are no long term assurances that existing landowners will abide by the guidance provided? Should such an effort be tied to legislation similar to that authorizing private forest management? A major question concerns whether this

service should be available for all habitats or whether it should focus only on specific critical habitats for rare species.

It is recognized that such technical assistance or acquisition referrals may still not assure protection, as some sites may not meet the criteria of other acquisition programs. In a few cases, therefore, it may be necessary for the Nongame Wildlife Program to initiate acquisition. Such actions should be on a case by case basis and adhere to NWP acquisition guidelines yet to be established.

Wildlifefe is a product of the land. The challenge is to maintain more wildlife on less land. Depending on land ownership. two types of opportunities appear to exist. On public lands, land management and interagency coordination are of utmost importance. On private lands, techniques for habitat protection including technical assistance and landowner education, legislatively mandated land use regulations, and financial incentives are important opportunities.

Opportunities to Resolve the Issue:

1. Identify the location, quantity, and quality of habitats important for endangered, threatened, and special concern nongame species as well as other important habitats on a statewide basis. There is a need to monitor these habitats so as to be able to quickly respond to negative changes that may occur in these critical habitats.
2. Coordinate the identification of these critical habitats by working more closely with the establishment of field inventory priorities for Natural Heritage staff plant ecologists.
3. Establish criteria and procedures to guide NWP acquisition efforts.
4. Facilitate or carry out the protection of key critical nongame wildlife habitats, focusing on those habitats for endangered, threatened or

special concern species through fee or easement acquisition or other protection techniques.

5. Use the DNR and other agencies' environmental review processes and procedures to optimize input and alert developers on the significance of nongame species. Streamline the review process by focusing on alternatives and mitigation so as to enhance projects that are carried out.
6. Consider a Wildlife Protection Act to establish state policy for the protection and enhancement of wildlife with legislative mandates to implement the policy. As a part of this policy effort, assess the legal mechanisms in other states that offer protection to wildlife and its habitats through land use planning regulations, tax incentives for habitat protection or enhancement, land retirement programs, and removal of financial subsidies that ultimately degrade wildlife habitat with the idea of seeking their implementation in Minnesota.
7. Take the lead in promoting the adoption of the necessary regulations and commissioner's orders within the Department of Natural Resources to carry out all of the mandates of the state Endangered Species Act.
8. Promote state legislation or regulation to further the control of toxic substances in the air and water, to deal with problems such as lead shot, and to preclude the introductions and/or propagation of exotic species into Minnesota. Further, promote the appropriate federal laws on toxic shot and acid precipitation.
9. Promote the maintenance of a strong federal Endangered Species Act, become an advocate for nongame appropriations under the Fish and Wildlife Conservation Act of 1980, develop working agreements with federal agencies concerning nongame species management on federal

lands.

10. Develop and implement formal working agreements and guidelines with other land management agencies or DNR Divisions to provide direction and management assistance (seasonal crews, equipment, and management funds) concerning nongame species habitat needs on public and private lands.
11. Whenever possible, promote the implementation of an ecosystem approach to natural resource lands management by linking lands under various ownerships through cooperatively designed and implemented acquisition and/or management plans.
12. Establish a technical services program that can advise private landowners or other agencies on public services (technical assistance guidelines), subsidies available (tax credits), and protection mechanisms (leases, easements) to 1) avoid adverse actions which degrade or eliminate wildlife habitat or otherwise substantially threaten nongame wildlife populations, 2) mitigate unavoidable loss of habitats, and 3) improve existing habitat, including urban and backyard habitats and small woodlots.
13. Develop, as a part of a broader public awareness program, educational materials to promote an understanding of the necessity of adequate habitat for maintaining wildlife populations. This effort should include information on the status of wildlife habitat and what the public can do to positively influence attitudes on the retention and maintenance of wildlife habitat in their own community and statewide.
14. Investigate the applicability of the Habitat Evaluation Procedures or other procedures in order to establish the value of lands maintained as wildlife habitat.
15. Consider the establishment of Demonstration Areas throughout the state which demonstrate good wildlife habitat management practices, particularly for woodlots and agricultural lands.

## NONGAME WILDLIFE PROGRAM FUNDING

Issue Statement: THE NONGAME WILDLIFE PROGRAM IS FINANCED BY VOLUNTARY DONATIONS TO THE NONGAME WILDLIFE CHECKOFF FUND AND HAS GENERATED SIGNIFICANT SUPPORT FROM MINNESOTA CITIZENS. LONG-TERM PROGRAM STABILITY AND SUCCESS WILL DEPEND ON EXPANDED FUNDING TO INCLUDE ADDITIONAL REVENUE SOURCES.

Except for some administrative support, the Nongame Wildlife Program is financed from a single source, citizen donations to the Nongame Wildlife Fund. Adequate, additional state and federal monies or other funding have not been available. As a result, the program's funding is vulnerable to fluctuations and the Program is unable to finance all actions required to meet resource needs. It is necessary to develop adequate, stable, long-term financing for the Nongame Wildlife Program based on more than one funding source.

Discussion: Minnesota's Nongame Wildlife Program began in February, 1977. Funding was derived from the Game and Fish Fund and totalled less than \$30,000 annually for four years from 1977 to 1980. Additionally, donations from sportsmen's groups and conservation clubs helped initiate restoration projects for the trumpeter swan and the river otter.

In the spring of 1980, the Minnesota Legislature established a nongame wildlife checkoff provision on Minnesota's income tax and property tax forms. The nongame wildlife checkoff (Minn. Stat. Sec. 290.431) initiated a new era for Minnesota's Nongame Wildlife Program.

The legislation provided that Minnesota taxpayers could donate \$1.00 or more, up to the total amount of their refund, on state income tax forms

and/or property tax forms. The amount of money donated was deducted from the refund due the taxpayers and credited to the Nongame Wildlife Fund.

In 1981, the state legislature amended the nongame checkoff law to allow taxpayers not receiving a refund to contribute by adding a donation to the amount of taxes due. The amendment also provides that the Nongame Wildlife Fund account is subject to overview by the Legislative Commission on Minnesota Resources (LCMR). Biennial budgets must be approved by the LCMR, and any land acquisitions by the NWP require individual LCMR approval. Semiannual summaries of biennial budget status are also required.

Money accrued by the Department of Revenue from the checkoff is transferred to the DNR on June 30 and January 1. To date, the amount transferred on each date has been approximately \$400,000 and \$200,000, respectively. The money spent by the NWP in a given fiscal year, July 1 to June 30, consists of the January 1 payment accrued from donations of the last half of the previous calendar year and the June 30 payment accrued from donations of the first half of the current calendar year. This procedure allows the NWP to begin its fiscal year on July 1 knowing exactly how much is available for expenditure in the coming year.

Minnesota is the only state in the nation which allows taxpayers to donate to the Nongame Wildlife Fund on their Property Tax Refund Returns (M1-PR forms). This source of revenue is important for the NWP as the percentage of total revenues derived from property tax returns has increased during the past 3 years from 8.6% to 20.1%. One reason for this may be that persons who do not receive a refund on their income tax returns may use the property tax form to make a donation from that refund.

In 1981, 98.1% of the 699,769 persons who filed property tax forms received refunds averaging \$271.55. It is assumed that if a person files

both an income tax and a property tax return, only one donation to the Nongame Wildlife Fund is likely.

Table 1. Summary of total donations to the Minnesota Nongame Wildlife Checkoff, 1980-1982.

<u>Tax Year</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>
Total Donations	\$ 523,743.65	\$ 619,253.43	\$ 616,665.28
Total Donations	154,376	194,092	200,154
Average Donation	\$ 3.39	\$ 3.19	\$ 3.07
Donation Rate	8.87%	11.51%	11.74%
% Tax Payers Receiving Refund	82.00%	71.80%	62.9%

The amount of money contributed to the Nongame Wildlife Fund raised in Minnesota has totalled over \$1,750,000 during the period 1980 - 1982 (Table 1.). In 1980 and 1981, more Minnesota taxpayers donated to the Nongame Wildlife Checkoff than any other state in the United States. The total amount of money raised ranked second only to Colorado during the same period. For tax year 1982, both the number of donations and total donations ranked second to New York among 20 states with a wildlife checkoff on their state income tax forms.

Colorado's checkoff income more than doubled during its first four years (U.S. Dep. Inter. 1982a). A similar pattern is not occurring in Minnesota where the level of income was approximately the same in 1981 and 1982. This trend may be partly due to the state income tax surcharge which was implemented for the 1982 tax year and lowered the percentage of

taxpayers receiving refunds (Table 2). While taxpayers can make donations either from their refund or by adding to the taxes due, most persons donate from their refund.

It is very encouraging to see that the number of donations has continued to increase during the first three years of the program. In contrast, the average donation decreased slightly from \$3.39 to \$3.07 - the lowest average in the nation. One explanation for the low average may be because of the way the checkoff is worded on the tax forms.

In 1981, 61.6% of all donors to the checkoff donated exactly one dollar - suggesting that they may be misinterpreting the nongame wildlife checkoff to be a one dollar checkoff. Most other states have a format which presents several checkoff boxes for specified amounts and a blank for write-in of another amount.

However, it is also possible that many people are willing to give just one dollar. This factor may explain the state's high overall donation rate. The percentage of people donating to the Nongame Wildlife Fund in Minnesota is more than twice the national average - 11.7% vs. 5.5% (Nongame Wildl. Assoc. N. Am. 1982).

There are two distinct publics among taxpayers: people who prepare their own tax returns, and those who go to tax preparers. There is a large difference between the donation rates of the two groups. In 1983, the donation rate was 13.4% for self-prepared M-1 Income Tax forms and only 5.0% for forms prepared by tax practitioners. On M1-PR Property Tax forms, the donation rate was 10.3% on self-prepared forms and only 2.0% on forms prepared by tax practitioners.

It would appear that some tax-practitioners impose a bias against the checkoff by omitting reference to it during the tax preparation process or

by discouraging their clients from giving. Some prefer to skip the checkoff item because it takes too much time to explain the checkoff to a client who is unfamiliar with the Nongame Wildlife Fund.

While it is anticipated that the nongame wildlife checkoff will remain a permanent feature on Minnesota's income tax and property tax forms, it is possible that legislative action could 1) eliminate the checkoff (Roggis 1984), 2) divert funds to unrelated uses in state government, 3) add additional checkoff items to the tax form for other funds and thereby dilute the effectiveness of the nongame wildlife checkoff (Applegate 1984, Roggis 1984), or 4) appropriate funds to wildlife-related activities which fall within the scope of the NWP but are of low priority.

During the past three years, there have been four proposed legislative actions which could have adversely affected the Nongame Wildlife Checkoff Fund. There was so much public opposition to the actions that the proposals were substantially modified or never implemented. A serious problem associated with such legislative proposals is that they can cause the public to lose faith that their donations will be used in the best interest of wildlife. Such a loss of faith may result in a decline in citizen participation in the checkoff.

In response to the intense debate which followed the most recent controversial proposal, Representative Skoglund introduced an amendment 1/ that prevents attempted diversions of checkoff money to unrelated purposes. The amendment was passed.

Additionally, the Department of Revenue has taken the position that any additional checkoffs would complicate the tax form and should be avoided. No additional tax checkoff proposals have subsequently been introduced.

Declines in funding need to be avoided to prevent the reduction or

elimination of current projects. Maintenance of current revenues cannot be assured without diligent effort to prevent loss due to: 1) change in taxation laws or procedures, 2) legislative adjustments to dedicated funds, and 3) a decline in citizen participation in the checkoff due to economics or other factors.

Several actions need to be taken to prevent declines in funding. Continuing coordination with the Department of Revenue is essential to maintain good liaison during annual adjustments in income tax and property tax form design, wording and format. The Minnesota Legislature in general and the LCMR particularly need to be kept advised about the Nongame Wildlife Program's utilization of checkoff donations and the continuing high level of citizen support and involvement.

One action which would also help put program cost and expenses in perspective for legislators and other interested individuals is to develop a better understanding of the financial contribution which nongame species make to Minnesota's economy, including a quantification of citizen demand for these resources. The documentation of a considerable monetary return to the state's economy from resource-related activities should encourage private and public support for the Nongame Wildlife Program.

The best way to maintain or increase citizen participation is to operate a progressive, diversified nongame program that has broad appeal to Minnesota's citizens. The most effective promotional efforts must be determined (Applegate 1984) and implemented. Further the relationship

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1/ Laws of Minnesota 1983, Chap. 342. Art. 1, Sec. 35, amending Minn. Stat. Sec. 290.431

between promotional and educational efforts needs clarification. A determination needs to be made regarding the appropriateness of promotional efforts serving an educational function.

It appears that not all citizens interested in the resource contribute to the Nongame Wildlife Fund either by choice, because they do not know how to contribute, or for other, unknown reasons. Consequently, there is a need to identify the audience and evaluate the effectiveness of current checkoff promotion efforts in order to target missing citizen participants and increase revenue.

The vulnerability of a program funded solely by a voluntary source of revenue, the allocation of which is entirely dependant on the Legislature, is clear. The cause of the situation is, in part, the absence of direct state and federal financing for the nongame resource programs. The consequence to the resource of this restricted financing is a politically vulnerable management program which could collapse within a short period.

If checkoff donations remain the sole alternative for Nongame Wildlife Program funding, the amount of revenue can be expected to level off. It may even decline (John Torres, pers. comm.). Therefore, there is a need to broaden the long-term funding base. New revenue sources need to be identified which will supplement or match checkoff revenue. These sources could be derived in part through cooperative funding of special projects with other agencies statewide.

This has been undertaken to some extent already for the otter and peregrine restoration programs in conjunction with Program land acquisition. Another possibility is cost-sharing special projects with nongame checkoff programs in adjacent states.

Other forms of financing to broaden and stablize nongame program

funding include the appropriation of money through the Fish and Wildlife Conservation Act of 1980, increased appropriations through Section 6 of the federal Endangered Species Act, and allocation of Pittman-Roberts and Dingell-Johnson funds to directly finance some nongame projects. The Fish and Wildlife Conservation Act of 1980 provides for an assessment of various alternatives for funding this act. The U.S. Fish and Wildlife Service will complete this study by December, 1984. (U.S. Off. Fed. Register 1983b). Among the most viable possibilities are excise taxes on bird seed, bird feeders, bird houses, field guides, and similar products.

There has been inadequate funding to the states for Section 6 of the Endangered Species Act funding during the past 3 years. The Nongame Wildlife Program has received a total of only \$20,000 during the past 2 years for peregrine falcon restoration work. This amount needs to be increased substantially in order to adequately address the needs of those nongame species which are threatened or endangered. Projects for federally listed species should be funded largely by federal monies (see Langer 1984).

Currently, funding is generated annually. Long term funding in a time frame which matches the temporal scope of each planning cycle ( 2 bienniums) is a more desirable approach and alternatives to accomplish this should also be investigated.

Finally, the funding strategies of other state checkoff programs need to be reviewed to determine the opportunity for adapting successful funding strategies in other states (Bevill 1984).

In summary, the Nongame Wildlife Program must continue to offer an effective and popular program to Minnesota citizens that will result in continued citizen interest and financial support. Responsiveness to public preferences, and the ability to educate those preferences, will become

increasingly important as the novelty of the wildlife checkoff decreases (Boggis 1984) Biological integrity must be maintained at the same time that funding aspects remain creative, efficient, and cost-effective. At the same time, a broadening of the Fund's base of support must be accomplished in order to insure a future for the State's initiative to protect and manage the resource.

Opportunities to Resolve the Issue:

1. Employ market research techniques in the development of a checkoff promotion strategy based on :
  - a) a determination of the most effective promotional techniques;
  - b) description of the present participants and delineation of new contributors;
  - c) determination of motivation for current citizen participation;
  - d) identification of weak links in the existing promotion network and of opportunities for additional organizations/individuals to participate in promotion .
2. See opportunity 13 page 18 on economic studies.
3. Establish a task force to develop information on the economic values of wildlife for use in benefit/cost analysis and mitigation assessment. (see Issues on Habitat and Data Acquisition).
4. See opportunity 8 page 63.
5. Enhance capability of limited dollars by seeking funding from other agencies and organizations to directly finance or cost share particular programs of mutual interest and benefit such as research and habitat protection .
6. Encourage appropriation and expansion of federal aid funding to states for nongame wildlife management through Section 6 of the

Endangered Species Act and through the Fish and Wildlife  
Conservation Act of 1980 .

7. Investigate and evaluate new methods to broaden the long-term funding base of the Nongame Wildlife Program .
8. Review the funding strategies of other state agencies for ideas of methods to expand financing of programs which benefit the nongame resource in Minnesota .
9. Keep the Legislature informed about nongame resources, the Nongame Wildlife Fund and citizen interest and participation in these programs through an annual report .
10. Investigate and implement new wording on the tax forms to encourage an increase in average donations up to the national average .
11. Develop a strategy to increase tax preparers' awareness and support for the tax checkoff so that the overall donation rate could be raised to a level characteristic of people who make out their own tax forms .
12. Establish a contingency fund to finance Nongame Wildlife Program activities through any temporary periods of decline in check-off receipts .

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