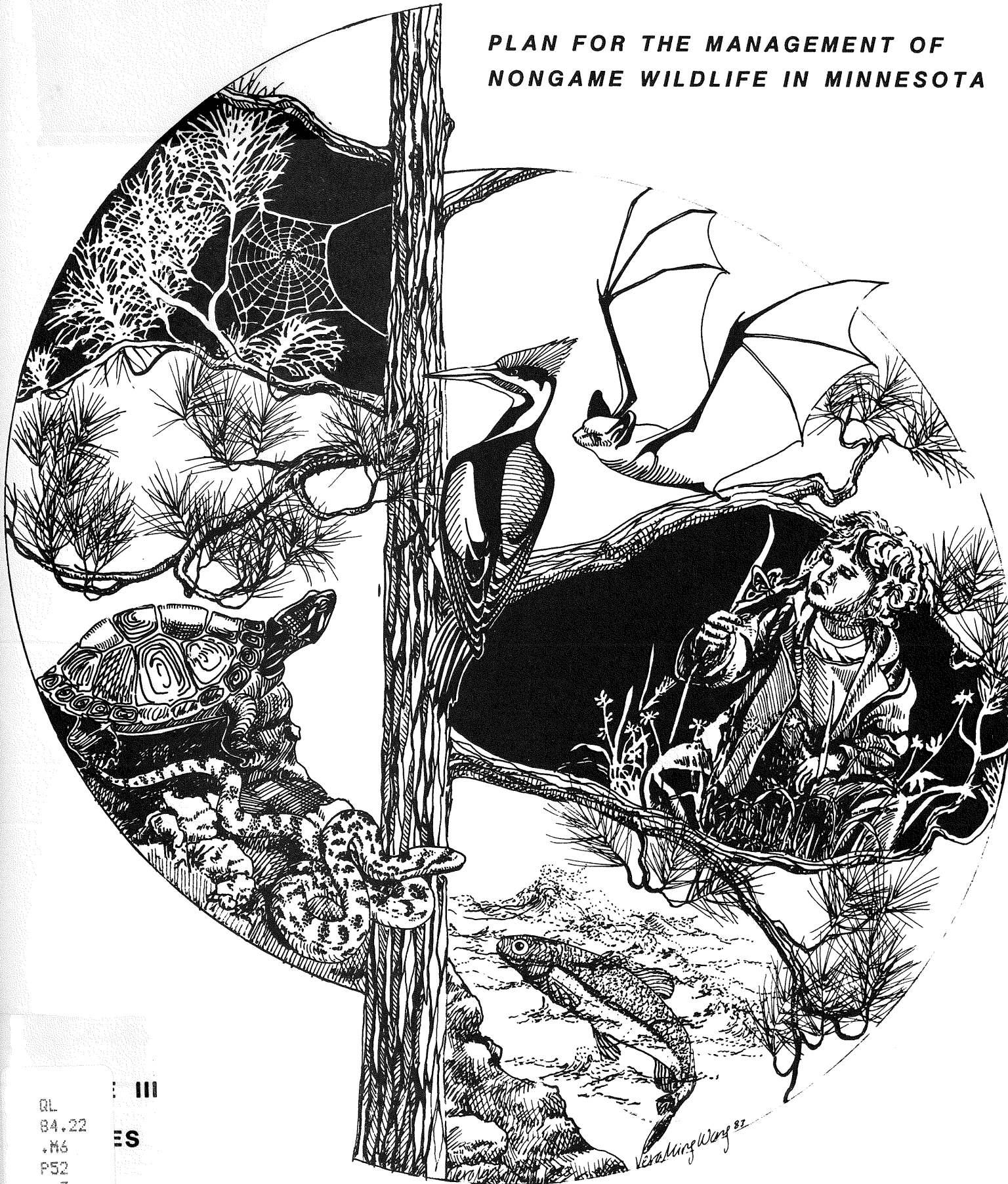




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PLAN FOR THE MANAGEMENT OF NONGAME WILDLIFE IN MINNESOTA



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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 - 10/84

Vol. 4 - Goals and Strategies

Vol. 5 - The Operational Plan

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Plan for the Management of Nongame Wildlife
Nongame Wildlife
in Minnesota

Volume 3 - Issues

Date: October 30, 1984

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

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INTRODUCTION

This document, Volume 3 - Issues, is 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 eight resource issues addressed in the volume have been identified by Nongame Wildlife Program personnel, assisted by a Technical Advisory Committee of representatives from other Department of Natural Resources disciplines and by the general public (Minn. Dep. Nat. Resouc. 1981). Although the issues are interrelated, they are presented individually in separate chapters. The order of their presentation is not intended to indicate priority of concern. The issues are equally important.

Each issue is concisely described in an Issue Statement and introductory paragraph which provide a focus for the Discussion section. The discussion elaborates on the cause of the issue; past actions to define, monitor and/or resolve the issue; and consequences 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 suggested approaches for addressing a specific issue. One or more of the opportunities may evolve into strategies for Issue resolution to be delineated in Volume 4 (Goals and Strategies). They even may become future policy recommendations.

Volume 3 serves two important functions. It provides a description of the issues identified as important for the management of Minnesota's nongame resource and is 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 that follow are dynamic and complex. Their relative importance may be perceived differently by various people and will change as future environmental, economic, social and political conditions evolve. As a result, this volume will need periodic revision. Your continued comments on its contents are encouraged and welcome.

COMPREHENSIVE PLANNING

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

The Nongame Wildlife Program will operate more effectively and efficiently if guided by a comprehensive plan which considers legal mandates, resource needs and priorities, citizen desires, and the long-term consequences of Program actions. The Nongame Wildlife Program management plan must: 1) define the scope and limits of the Nongame Wildlife Program's responsibilities; 2) identify the Program's goals and priorities; and 3) effectively guide Program activities toward the attainment of quantified objectives for the conservation of the nongame resource.

Discussion: 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. 97.48 subd. 8). The Commissioner delegates responsibility for wildlife conservation programs to the Division of Fish and Wildlife.

In 1977, the Division's Section of Wildlife initiated the Nongame Wildlife Program in recognition of nongame needs and in 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.)). The law

established 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 nongame resource management projects (Minn. Dep. Nat. Resour. 1984a).

The rapid expansion of Minnesota's nongame program typifies the growth of nongame programs in other states. Currently, 32 states operate resource management programs funded by citizen donations. These programs exemplify nationwide interest and concern for all wildlife and other natural resources.

Guiding the long-term direction of such rapidly growing programs is difficult. A number of considerations may affect program development and operation. A comprehensive plan has been identified by Nongame Wildlife Program personnel, Department administrators, and interested citizens as the only realistic way to simultaneously address all constraints affecting the Nongame Wildlife Program's operation.

The primary purpose of planning is to become more effective at realizing results (Crowe 1983). The consequences of a failure to address Nongame Wildlife Program constraints through a comprehensive plan include the possibility that low priority projects could be chosen, major resource needs may be overlooked, and the 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. In Minnesota, a planning position was created within the Nongame Wildlife Program in 1982. Subsequently, a nongame plan (Minn. Dep. Nat. Resour. 1983a) was initiated. At the federal level, 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).

One of the major considerations to be addressed by the state plan is a need for consistent funding for nongame resource management activities (Howard et. al. 1980). Tax checkoff legislation has not completely resolved the matter. A consistent level of funding is not guaranteed from checkoff funding as donations may vary from one year to the next. 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). Additionally, current financing is not adequate to simultaneously undertake all the actions which have been identified as important for the conservation of Minnesota's nongame resource (Minn. Dep. Nat. Resour. 1981). Consequently, priorities must be defined (see Issue on Endangered Species) by the planning effort.

Another consideration is the absence of an official definition of the term "nongame." While the Department's obligation for endangered and threatened species is a legislative mandate, Bobwhite Quail, Prairie Chicken, Sandhill Crane, American Elk, Pine Marten, and Woodland Caribou are examples of species for which Nongame Wildlife Program jurisdiction and management responsibilities are uncertain. As a consequence, the Nongame Wildlife Program is still working to clarify its responsibilities relative to Minnesota's 600+ vertebrate species and their habitats. A determination

of the Nongame Wildlife Program's responsibility for invertebrate species must also be made.

Nationwide, there is no standard or generally accepted definition of the term "nongame." The various states with nongame programs have different operational definitions. None of the state definitions conform exactly with the federal definition in the Fish and Wildlife Conservation Act of 1980 which reads:

"(6) The term "nongame fish and wildlife" means wild vertebrate animals that are in an unconfined state and that --

(A) are not ordinarily taken for sport, fur, or food, except that if under applicable State law, any of such animals may be taken for sport, fur, or food in some, but not all, areas of the State, any of such animals within any area of the State in which such taking is not permitted may be deemed to be nongame fish and wildlife;

(B) are not listed as endangered species or threatened species under the Endangered Species Act of 1973 (16 U.S.C. 1531-1543); and

(C) are not marine mammals within the meaning of section 3(5) of the Marine Mammal Protection Act of 1972 (16 U.S.C. 1362(5)).

Such term does not include any domesticated species that has reverted to a feral existence. (PL 96-366 Sept. 29, 1980)."

In Minnesota, an unofficial definition has been proposed as follows:

"The term "nongame" includes all wildlife not directly managed with license revenue. Additionally, the term "nongame resource" shall mean the nongame species in combination with their habitats." (Tech. Advisory Committee meeting, Nov. 1983, unpublished minutes).

A final consideration in plan development relates to the fact that nongame resource management is a recent field which is still evolving from the traditions of game management and an understanding of ecological principles. Animals under the jurisdiction of nongame programs usually have 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). Nevertheless, innovative techniques are being developed and implemented

(Temple 1983, Nongame Wild. Assoc. N. Am. 1983). The need to be aware of 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 can only be balanced by thoughtful planning.

To date, the Nongame Wildlife Program 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 underway, the Nongame Wildlife Program will, in the next year, begin to address the needs and priorities 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. Adopt an official definition for the term "nongame." Consider the term "nongame fish and wildlife" as defined in PL 96-366-Sept. 29, 1980 as an alternative to reduce the proliferation and complications of inconsistent legal definitions.
2. Prepare a general statement on behalf of the Division that: 1) officially defines the term "nongame," 2) delineates the Nongame Wildlife Program's responsibilities within the scope of the Division's obligations to wildlife, invertebrates, and native plants, 3) sets forth the Program's philosophy and establishes policies on the management of invertebrates and other resource

considerations.

3. Continue an ongoing planning effort for the Nongame Wildlife Program that: 1) establishes Program goals, and strategies for goal attainment, 2) develops Program policy and priorities, 3) suggests actions for other agencies, and 4) monitors Program direction.
4. Encourage the Division of Fisheries and Wildlife to conduct comprehensive long-range planning which would clarify Division policy and the relationship of the Nongame Wildlife Program to other Division and Department programs and responsibilities.
5. Maintain flexibility in the current Program organization so that adjustment of personnel and funding can easily be made if recommended by the plan.
6. Assure that future legislative mandates which may be initiated to adjust Nongame Wildlife Program priorities 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. Encourage the U.S. Fish and Wildlife Service and U.S. Forest Service to implement their management plans in a timely manner and in coordination with the Nongame Wildlife Program.
10. Seek citizen review of the Nongame Wildlife Program's planning effort and ongoing citizen participation in the determination of future Nongame Wildlife Program direction and priorities.

COORDINATION TO ENHANCE NONGAME RESOURCE CONSERVATION

Issue Statement: IMPROVED COMMUNICATION AND COORDINATION AMONG PUBLIC AGENCIES, PRIVATE ORGANIZATIONS AND INDIVIDUALS IS NEEDED TO MAXIMIZE NONGAME RESOURCE CONSERVATION EFFORTS.

Many organizations influence, regulate, and undertake activities that affect 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. There is also a need to define the Nongame Wildlife Programs's role in the statewide nongame resource conservation effort.

Discussion: In response to public expectations and insistence by wildlife professionals, 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 government agencies conduct activities impacting the nongame resource (Minn. Dep. Nat. Resourc. 1983b).

Intra-Agency Coordination - The most important aspect of the issue is the Nongame Wildlife Program's relationship to other programs of the DNR, particularly within the Division of Fish and Wildlife. Within the Division, the Nongame Wildlife Program interacts significantly with the Scientific and Natural Areas Program and the Natural Heritage Program. The joint activities of these three Programs reflect a conceptually broad approach that considers management actions on an ecosystem basis, as well as for priority species. The Nongame Wildlife Program's acknowledgement of the importance of the concept of the management is expressed in the contribution of Nongame Wildlife Fund monies to the Natural Heritage Program to support

one staff botanist. Together, these programs represent the Department's ongoing and expanded commitment to the management of plants, animals and natural habitats not traditionally a focus of Department activities.

The benefits of a broad ecosystem approach are many, and such a philosophy has implications Department-wide. Consequently, it may be more appropriate to secure Departmental funding for the Natural Heritage Program botanist position. Clarification of each program's responsibilities, functions and goals relative to the nongame resource is necessary to avoid duplication of effort and maximize effectiveness.

The Nongame Wildlife Program must also clarify the mechanisms for incorporating its concerns and information into the Division's overall 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, some revisions in current programs may be necessary to assure that all Division actions reflect a comprehensive approach to wildlife conservation.

The actions and policies of all other Divisions within the DNR also have the potential to affect nongame wildlife. Peatland development is an example. 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. Two projects have been jointly undertaken 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 and 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 and vice versa. The consequences of this timber/wildlife interrelationship on forest management 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. Dept. 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 species. Actions to accomplish this have already been initiated.

Coordination with the Division of Parks and Recreation is also important. The Division of Parks and Recreation has management authority for state park lands. These parks are important to the nongame resource. They offer an opportunity to manage for special conditions such as old growth forest types or 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.

In addition, the Nongame Wildlife Program needs to communicate with the

Department's Office of Planning, Land Bureau, Division of Enforcement, Environmental Education Board, Trails and Waterways Unit, Bureau of Information and Education, and the Division of Waters. 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 DNR's personnel.

Except for the Division of Fish and Wildlife, consideration of wildlife needs is a secondary responsibility of all Department disciplines. Consequently, there will be differences in goals and policies that will require compromise. Perfect coordination and communication is not always 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 government agencies affect Minnesota's nongame resource, either directly or indirectly. In addition to the DNR, the U.S. Fish and Wildlife Service and the National Park Service have direct responsibilities for nongame resource conservation. As part of its legal mandate to practice multiple use management, the U.S. Forest Service has responsibility for wildlife habitat conservation on the 2.8 million acres of land under its jurisdiction in Minnesota. The Forest Service has made a very substantial effort to address nongame wildlife needs in its land management and research programs. The Nongame Wildlife Program'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 conservation as a significant part of their mission. 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, Department of Transportation). 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 these agencies. While communication with these agencies has been active in the past, improved communication is desirable.

The Nongame Wildlife Program's ability to address the needs of some nongame species is complicated 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. The U.S. Fish and Wildlife Service has shown considerable initiative in this regard through the annual Endangered Species Coordinators' Meeting for Region 3 representatives from 8 midwest states and Ontario.

It is the Division of Fish and Wildlife's responsibility to incorporate information on wildlife resources into the decision making process of 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 regard to information exchange is discussed as part of the Data Acquisition and Information Management Issues.

Coordination with 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 government agencies to make decisions which may 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, Minnesota Ornithologists' Union; National Audubon Society, Sierra Club, Izaak Walton League, Minnesota Conservation Federation, and other citizen conservation organizations;
- b) The Farm Bureau, Farmers Union, National Farmers Organization, and other agricultural organizations;
- c) Industrial organizations such as those of the timber and mining industries;
- d) Private landowner and lakeshore associations; and
- e) 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. Some contact should be established with all groups as 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 (Eumeces fasciatus). 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, 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 be necessary for the Nongame Wildlife Program to serve only as a source of information to the coordinator.

Future Considerations - 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 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 some private and public groups that the Nongame Wildlife Program should assume all responsibility for coordination, leadership and funding activities that impact nongame resource management in Minnesota. However, the Nongame Wildlife Program is small and alone cannot accomplish all that is needed. In some instances, the Nongame Wildlife Program may serve the needs of the resource by assuming such coordination or leadership responsibilities. In other circumstances, it may be more appropriate for other agencies with the necessary experience and administrative skills to assume leadership or coordination jobs for specific projects. The task at hand is to develop a strategy that delineates the Nongame Wildlife Program's approach to matters of coordination.

Opportunities to Resolve the Issue:

1. Focus initial attention on coordination with the Division of Fish and Wildlife's other programs, particularly the Natural Heritage Program and the Scientific and Natural Areas Program.

2. 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.
3. Encourage and assist, to the extent possible, the National Park Service, the U.S. Fish and Wildlife Service, and the U.S. Forest Service in conserving native wildlife and habitat as provided by legislation or cooperative agreements.
4. Develop or revise Forestry/Wildlife Coordination Policy and 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.
5. 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.
6. Jointly initiate and fund studies with other agencies or individuals on resource management considerations of mutual interest.

7. Identify areas where duplication of effort is occurring (e.g. handling and nongame wildlife control problems and preparation of extension education material) and develop strategies to cooperatively proceed in a more efficient manner.
8. 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.
9. Promote an understanding within the private groups mentioned in opportunity 8 of the extensive citizen interest and support which exists in Minnesota for nongame resource conservation.
10. 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.
11. Seek out specific opportunities to work with county and municipal government agencies on cooperative projects of research, inventory, or management and to provide technical assistance to their personnel for nongame management on county lands.
12. Implement a mechanism through the existing interagency network to assess any nongame concerns which may be identified in the environmental review processes of other government agencies (EQB, PCA, etc.).
13. Improve the Division's knowledge of the economic value of the states' wildlife resources. Agencies, legislators, and individuals

are generally familiar with dollar value. When the Division can present wildlife in economic terms, others may develop a greater appreciation for the resource.

14. Meet regularly and work jointly with selected District Foresters, Park Managers, private landowners, and others on innovative, cooperative nongame management projects to demonstrate coordinated management. Publicize these efforts at appropriate public meetings.
15. Identify opportunities for other agencies, organizations, or individuals to implement actions to benefit the nongame resource.
16. Initiate a public relations effort to create a general public awareness. A receptive public can make it easier to gain cooperation of groups and agencies.
17. Maintain a directory of agencies, organizations, and individuals conducting nongame resource-related activities.

PUBLIC AWARENESS AND PUBLIC PARTICIPATION

Issue Statement: PUBLIC AWARENESS, UNDERSTANDING AND APPRECIATION OF WILDLIFE NEEDS AND VALUES MUST BE ENCOURAGED IN ORDER TO ENHANCE PUBLIC PARTICIPATION AND INSURE FUTURE WILDLIFE RESOURCES.

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

Discussion: People who are knowledgeable and concerned about natural resources and who are involved with resource conservation are the Department's strongest allies in successfully protecting and enhancing wildlife resources. It is difficult, however, to generate support or enthusiasm for wildlife species that the public dislikes, fears, or has never heard about. There is a need, therefore, to: 1) increase the general public's awareness of nongame species that occur in Minnesota, 2) raise their level of appreciation of these species and their habitats, 3) change negative attitudes toward certain species, 4) determine the nature and extent of public interest in wildlife, and 5) identify ways to enhance opportunities for public participation with wildlife resources.

Public Awareness - A large number of Minnesotans are interested in and concerned about the state's wildlife resources. However, even the concerned citizens are not necessarily well-informed. Many wildlife enthusiasts are unaware of the principles of population biology, ecosystems dynamics, or wildlife management. As a consequence, their actions on behalf of the wildlife resource may be inadvertantly detrimental or counter to agency

actions. These citizens are interested in more knowledge. They should be encouraged to learn more and to express their concern. 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 habitat coupled with an absence of public understanding that is detrimental to many wildlife populations. Landowners, for example, may unknowingly destroy 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 wildlife harassment, capture and killing to the extent that local populations may be destroyed and important or unique habitat lost. Improved public awareness is needed to counteract such attitudes.

Creating public awareness is the process of informing and educating the public to the values and benefits of wildlife. The DNR's Bureau of Information and Education is responsible, in part, for informing and educating Minnesota's residents about the state's fish and wildlife resources. This is being attempted 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.

The six regional naturalists and seasonal interpreters in the Division of Parks and Recreation, as well as the Division of Fish and Wildlife's area managers and biologists also provide information and present programs on

wildlife. The Minnesota Environmental Education Board (MEEB), also within the DNR, works to increase citizens' awareness about environmental and natural resource issues. MEEB focuses primarily on land use, energy, and water quality issues. Cooperatively MEEB, the Nongame Wildlife Program, 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."

These approaches and techniques have generally been inefficiently financed to reach the broad cross-section of general public audiences with constructive, informational, and inspirational messages regarding wildlife conservation needs and opportunities. This inadequacy could be overcome, in part, by increasing the use of modern electronic media and sound public relations principles.

In recent times, the demand for wildlife information has increased to a level where available Department personnel and facilities alone cannot provide for all public demands. In addition to the DNR, there are other government agencies and private organizations that provide information and promote awareness and concern for nongame wildlife. These include the U.S. Fish and Wildlife Service, the U.S. Forest Service, the U.S.D.A., the National Park Service, the Minnesota Agriculture Experiment Station, and Extension Service, the local National Audubon Society chapters, county conservation reserves, nature centers, the James Ford Bell Museum of Natural

History, the Science Museum of Minnesota, the Minnesota Ornithologists' Union, the Minnesota Herpetological Society, the Minnesota Humane Society and others. Recently, 60 facilities were identified in Minnesota, including 25 in the seven county metropolitan area, which provide wildlife and environmental education information (Minn. Nat. Assoc. 1984). The Nongame Wildlife Program's contribution to these statewide educational efforts needs to be delineated.

Despite present efforts, apparently the message is not reaching that segment of the citizenry that is unconcerned or poorly informed about wildlife. Unless a broad scale public awareness and understanding of wildlife is encouraged and increased, the wildlife resource will continue to suffer loss or degradation of habitat and, for some species such as snakes, unnecessary persecution.

Public Participation - Public awareness often leads to public participation. Public participation is a more complex process of citizen involvement in: 1) wildlife-related activities such as fishing, hunting, trapping, birdwatching or nature study, 2) legislative initiatives on behalf of the wildlife resource, 3) private activities to benefit wildlife, and/or 4) Nongame Wildlife Program development or operation.

Public participation in the development of the nongame management plan is encouraged under federal planning guidelines. The Nongame Wildlife Program sincerely desires such input, and a mechanism to encourage plan review has been established (Mn. Dep. Nat. Resour. 1983a). Public participation in the planning process is essential, not simply because Minnesota's citizens "pay the bills" through donations to the Nongame Wildlife Fund. Ultimately, the actions which will most directly insure wildlife's survival will be the natural resource laws adopted by all level

of government at the demand of an informed citizenry concerned for the preservation of wildlife habitat.

Increasingly, people want to participate directly in activities to benefit wildlife. A number of private citizens, for example, have shown considerable initiative in establishing a network of privately operated rehabilitation centers in Minnesota - the Wildlife Assistance Cooperative. For many people, the care of orphaned or injured individual wild animals is an easily understood and appealing idea. The Section of Wildlife allows private individuals to conduct wildlife rehabilitation activities at their own expense under the appropriate state and federal licenses. Except for funding to the Raptor Research and Rehabilitation at the University of Minnesota for the care of individual endangered or threatened raptors, the Division does not subsidize such wildlife rehabilitation efforts. The reason for this distinction in funding relates to the expectation that the fate of an individual member of a threatened or endangered species may be of consequence to the population. However, the impact on a population of rehabilitating a few individuals of a common species is insignificant. While rehabilitation is a popular activity, Department personnel are concerned that it not draw public commitment and DNR funding away from more critical habitat-related conservation activities.

A number of opportunities currently exist for public participation in the Nongame Wildlife Program's operation through volunteer cooperation in census and survey or education and promotion activities. A need exists, however, to improve the effectiveness of present participation and provide new opportunities.

Historically, the greatest public participation has been hunting, trapping or fishing for game species which were considered "valuable."

Knowing the habits of game animals was often a necessity for survival in a wilderness frontier. As agriculture expanded and settlements grew to towns, wildlife species that were valuable needed protection from over-harvesting. Legislation protecting birds was adopted, and wildlife agencies were created which established hunting seasons and limits on the number of game animals that could be legally taken. Although there was some interest in nongame species on the part of a few naturalists, scientists, birdwatchers, and legislators, most people gave little thought or time to nongame wildlife.

After World War II, 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 with wildlife declined. Inner city residents became far removed from most wildlife, knowing only the urban adapted sparrows, pigeons, and squirrels. Citizens who stayed on the farm often considered some forms of wildlife a nuisance, competitor, or target. Those that still enjoyed the outdoors participated in weekend fishing, hunting, or birdwatching trips.

During this time, wildlife agencies continued to focus on deer, grouse, pheasants, and ducks in rural and undeveloped areas of the state. Actions on behalf of wildlife in the urban environments generally consisted of providing technical assistance in response to citizen complaints resulting from unpleasant human-wildlife interactions.

The environmental movement that developed in the 1960's has helped to refocus citizen interest in natural resource conservation. Concern for pollution, toxic wastes, pesticides, habitat degradation, and endangered species, along with a realization of the limit to the availability of natural resources, profoundly influenced urban-raised and university-educated residents as well as those on farms and in small towns.

Participation with wildlife has grown beyond the traditional activities of recreational hunting and fishing. Birdwatching has become the fastest growing wildlife-related activity in North America (Butler 1983), with many participants enjoying the activity in their own backyard. Membership has 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, intended to promote citizens' understanding and enjoyment of wildlife in their everyday experiences.

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 urban wildlife management programs with nongame checkoff revenues. Because the majority of Minnesotans now live in urban areas, establishment of such a program in Minnesota has been suggested as one alternative for improving public awareness and opportunities for participation with wildlife. The Hennepin County Park Reserve District, the U.S. Fish and Wildlife Service's Minnesota Valley National Wildlife Refuge, and the nature centers already provide considerable wildlife management services and recreational opportunities in the state's major metropolitan area of the Twin Cities. The appropriateness of Nongame Wildlife Program involvement in an urban wildlife program must be carefully assessed.

Future Considerations - Identification of the types of wildlife experiences preferred by the public and an assessment of the need for increased opportunities to enhance such participation should be made before

the Nongame Wildlife Program initiates any new participation or recreation efforts.

Opportunities to Resolve the Issue:

1. Delineate publics, public groups and their information needs. Survey public attitudes toward and knowledge of various wildlife species and their needs. Identify the type of wildlife experience preferred by these public groups (Kellert 1980) and design Nongame Wildlife Program actions to focus on providing for those perceived needs and interests by expanding existing facilities and programs.
2. Identify areas of misinformation, lack of information and negative attitudes, and acquire and utilize educational products to correct such problems.
3. Conduct public education programs 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 webs and predator-prey relationships. They also should inform the public of DNR projects that involve nongame species.
4. Develop or acquire educational materials and programs which make it easy for educators to provide information about habitat and ecological principles. The most effective methods for reaching and influencing the most people should be employed. The general public and the school systems should be targeted. Youth groups like Future Farmers of America, 4-H, and Scouts should be considered.
5. Promote awareness and understanding of the economic benefits and values of wildlife and the ecological advantages of retaining

habitat for wildlife.

6. Develop an urban wildlife component for the Nongame Wildlife Program that would concentrate on increasing public awareness and appreciation of wildlife in Minneapolis/St. Paul and other metropolitan areas.
7. Simplify and promote usable and understandable wildlife regulations. Repeal bounties on venomous reptiles and upgrade wildlife possession regulations as needed for native and exotic species.
8. Encourage development of new methods/information systems to deal with nuisance wildlife complaints in a cost-effective manner.
9. Promote community environmental programs and distribute nongame information through MEEB and the existing environmental 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.
10. Develop opportunities for public participation through a well-planned volunteer program. Possible activities include loon and heron colony observations, bird house and feeder observations, or backyard wildlife habitat programs.
11. Promote citizens' support for legislative actions on environmental issues.
12. Consider the creation of a citizen advisory body for the Nongame Wildlife Program.
13. 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.

14. Clarify responsibility for promotional activities and delineate opportunities for cooperative efforts between the Bureau of Information and Education and the Nongame Wildlife Program.
15. Seek the cooperation of such agencies of the University of Minnesota Agriculture Experiment Station and the Agricultural Extension Service in the use of their communication network to distribute educational and technical materials.
16. Consider semi-annual working sessions of DNR personnel with private individuals and representatives of agencies and organizations to inform them of DNR projects and plans.

DATA ACQUISITION

Issue Statement: INFORMATION ON THE ECOLOGICAL AND ECONOMIC VALUES OF NONGAME SPECIES IS ESSENTIAL TO ADEQUATELY PRESERVE AND PROTECT THE NONGAME RESOURCE.

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.

Discussion: The principal charge of the Nongame Wildlife Program is to conserve Minnesota's nongame wildlife resource. Successful conservation depends on adequately understanding resource needs and the issues that confront the resources' continued existence. Such knowledge makes it possible to design and implement actions necessary to insure the perpetuation of nongame species and their habitats.

Data Acquisition Needs - The problems are that: 1) data are either lacking or inadequate for most species and 2) the types of information needed are diverse. For example, bird enthusiasts across the state are carefully delineating the distribution and abundance of nearly 400 bird species found in Minnesota. In contrast, the present county occurrence of even the common, but less appealing small mammal, reptile, or amphibian species are poorly documented. Data on the historical distribution and abundance of species and extensive information on species' life histories and habitat requirements are needed, as is data on the current quantity and

condition of various habitats. At the same time, a system is needed to monitor changes in habitat quality and quantity. Wildlife professionals also need information on the economic values of wildlife in Minnesota, as well as documentation of wildlife-associated recreation demand.

Historical data and current distribution records establish a baseline against which future population trends can be evaluated. Life history and distribution data are essential to understanding animals' needs, habitat relationships, and capabilities for continued existence.

If efforts to acquire essential ecological and economic data are not taken, program staff, as well as others, will be limited in their ability to address major resource issues. There are continuing demands to evaluate how proposed land use 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 alternatives that might mitigate negative impacts to species of concern is usually minimal.

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. Given the limited financial resources of state and federal natural resource agencies, it is critical that data be available to make informed acquisition decisions. Once a tract that provides critical habitat for species is acquired, agencies may need additional information for proper management.

The major reason for the absence of information is that funding has not been available to support nongame research or inventory projects. Monies recently available through Section 6 of the Endangered Species Act of 1973

have been inadequate, often difficult to obtain, and principally directed at federally listed endangered or threatened species.

Actions to Date - The Nongame Wildlife Program - 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. 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 depended on volunteers to collect distribution and abundance information. Such efforts helped delineate the statewide distribution of summering loons (Henderson 1979b, Hirsch and Henderson 1980), document the presence of two separate concentrations of breeding Sandhill Cranes (Henderson 1978), and recorded 455 nesting locations for Minnesota's colonial waterbirds - herons, egrets, cormorants, grebes, gulls, and terns (MN Dep. Nat. Resour. 1984b). These inventories have made important contributions to our knowledge. A future staff priority should include an evaluation of these projects to improve the consistency in volunteer efforts and the statistical design of the surveys.

With the availability of nongame checkoff funds in 1981, a major effort was initiated to design an expanded and comprehensive research and inventory program that began with the 1982 field season. One important aspect was the development of a small grants program to encourage and fund inventory and research on Minnesota's nongame fauna. Among the 35 projects so far funded (Daniels 1981, Nehl 1982, Loch 1982) 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.).

The Nongame Wildlife Program, with advice from Minnesota's Endangered Species Technical Advisory Committee, has initiated major inventory and research projects focusing on species needing immediate attention. In collaboration with the University of Minnesota-Duluth and the Arrowhead Regional Development Commission, an aggressive program of research, inventory, and habitat management was initiated to protect and enhance Minnesota's population of the endangered Piping Plover (Cuthbert and Wiens 1982, 1984, Met. Int. Comm. 1983). An intensive one-year study was conducted (Lang 1982, 1983) to delineate the distribution and abundance of Minnesota's rarest lizard, the Five-lined Skink (Eumeces fasciatus). Because little was known about bat species native to Minnesota, a third major project to delineate the distribution and abundance of bats in southeastern Minnesota, particularly at winter hibernacula, was initiated (Birney in prep.). A second phase of the study will focus on bats which are concentrated primarily in northern Minnesota.

The Nongame Wildlife Program has also contracted for a compilation of all the statewide occurrence records of reptiles and amphibians since 1944. This is the preliminary step in the eventual publication of the first new accounting of herptofauna since Reptiles and Amphibians in Minnesota was published (Breckenridge 1944).

A stream survey begun in 1971 to document the native fish fauna in Minnesota's riverine habitats has been re-initiated in collaboration with the Section of Fisheries. Publication of an atlas of Minnesota fishes is anticipated following the 1984 field season. Other 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.

Actions to Date - Other Agencies - The nongame wildlife resource is broad in scope, and the Nongame Wildlife Program is not the only agency responsible for data acquisition or resource management. Numerous federal, state, and county agencies and private organizations also are directed by mandates pertaining to nongame wildlife. The Endangered Species Office of the U.S. Fish and Wildlife Service has direct responsibility for coordinating data compilation activities pertaining to all federally listed endangered species as well as candidates for federal listing. The U.S. Fish and Wildlife Service has sponsored studies on the economic values and citizen demand for wildlife (Kellert 1980, U. S. Dep. Inter. 1982b) and is conducting a National Wetlands Inventory. 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.

At the state level, the DNR's Division of Minerals has been very active in initiating major research and inventory projects on nongame wildlife associated with peatlands (Minn. St. Plan. Agen. 1979). Some monies continue to be available to fund applied research pertaining to peatland reclamation and its implications for wildlife. The Division of Forestry also collects information pertinent to the nongame resource such as the Phase I and Phase II inventories of 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. The Natural Heritage Program catalogs rare native plant communities and other

habitat data pertinent for nongame management. The Natural Heritage Program also maintains the computerized distribution records on the state's endangered, threatened, and special concern plants and animals including selected invertebrate species.

Numerous other groups within the Department of Natural Resources as well as other state agencies also are involved in projects that provide information on the nongame resource (Mn. Dep. Nat. Resourc. 1983b). For example, the DNR's Division of Waters maintains the statewide Protected Waters and Wetlands Inventory. 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 helping to resolve the need for more data. The Minnesota Audubon Council, the Minnesota Ornithologists' Union and, most recently, the Minnesota Herpetological Society, are active 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.

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

become immediately clear. First, the Nongame Wildlife Program cannot possibly collect pertinent data on all of the hundreds of nongame species. Limited staff and revenue must be directed towards the most critical wildlife resources first, and criteria are needed to establish priorities for research in balance with other Program functions. Second, absence of data impedes the progress of numerous agencies and organizations charged with managing natural resources. Because financial and personnel constraints limit each group's actions, it is essential that the agencies cooperate in efforts to generate the necessary information. Third, research efforts should, in part, be 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 for the Nongame Wildlife Program has begun. The first priority is the Department's legal responsibility to protect those nongame species on Minnesota's official list of endangered, threatened, and special concern species (MN Dep. Nat. Resour. 1983c). Beyond a consideration of endangered and threatened species, all agencies and organizations are confronted with a problem of selecting priority species. Recently several attempts have been made to design an objective system to assist in the decision-making process (Neimi 1982). These methods are based on assessments of species' current abundance, historical abundance, general distribution, degree of threat, and critical needs. Some methods also evaluate components of the species' public appeal and economic value (Landry 1979, N.D. Game and Fish 1982, Nye 1981). Such methods should be evaluated by the Nongame Wildlife Program as it establishes a priorities ranking system for Minnesota.

It is also important that some measures are taken to monitor species.

Without baseline data that reflect general population trends, selection of priorities will be difficult. Some established monitoring procedures involving periodic surveys are already available for birds (e.g., Christmas Bird Counts, the U.S. Fish and Wildlife Service's Breeding Bird Survey Routes (see Henderson 1984), and the Section of Wildlife's Roadside Survey). For other vertebrates, monitoring methodology is currently not available.

Establishment of periodic surveys may not be the only means of monitoring these species. Monitoring the "health" and/or availability of the habitats the species depend on, or selecting indicator species, also are possible techniques. The challenge ahead is to decide what to monitor and how to efficiently accomplish the task.

In addition to selecting species priorities and monitoring techniques, the Nongame Wildlife Program needs to review the major habitat management actions that are currently employed in Minnesota and assess their implications to the nongame resource. Finally, the Nongame Wildlife Program also needs to be aware of priorities of other agencies in order to effectively cooperate with their research activities and to exchange information and research findings.

Opportunities to Resolve the Issue:

1. 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 nongame 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 forest inventories to provide more useful wildlife habitat data.
8. Participate in the State Planning Agency's update of the 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 professional journals and popular periodicals.
12. Where practical, incorporate nongame species into game inventory programs.
13. Encourage university personnel to conduct more wildlife research projects within Minnesota.

14. Encourage and participate in agencies' efforts to determine and publicize the economic values of the state's wildlife resources.

INFORMATION MANAGEMENT

Issue Statement: INFORMATION MANAGEMENT AND NONGAME WILDLIFE PROGRAM ADMINISTRATION REQUIRE AN UP-TO-DATE AND ACCESSIBLE DATA SYSTEM COMPATIBLE WITH OTHER NATURAL RESOURCE DATA BASES.

Coincident with the Nongame Wildlife Program's mandate to conserve the nongame resource is the need to efficiently manage information about that resource. Biological and economic data describing the resource must be well-organized and readily accessible to the public and resource managers so that wise decisions can be made. Equally important is the need to manage administrative information so that program goals are attained in the most efficient and effective manner.

Discussion: There are three major aspects to the issue of information management. First is the short-term need to organize and manage data that has already been acquired. Second is a long-term need to manage additional data acquired through new inventory and research projects. The third aspect of this issue is the need for the Nongame Wildlife Program to develop a data management system compatible with other computerized data bases and sources of resource information compiled by other investigators.

Information Management Needs - The Nongame Wildlife Program has initiated several projects to gather distribution and abundance data. Until recently, these data have been organized and maintained in manual files. Consequently, the Nongame Wildlife Program's efforts to analyze, interpret, summarize and disseminate this resource information have not kept pace with the influx of data contributed by expanded staff and volunteer efforts. Hundreds of records have been accumulated and keeping them organized and

accessible has become difficult.

In addition to handling existing biological information, Nongame Wildlife Program personnel must be able to efficiently manage existing administrative information (e.g., revenues, expenditures, staff time). Much of this information is available but needs to be compiled and computerized for quick access so that staff can evaluate the costs and benefits of program actions. Such analyses will facilitate wise decisions regarding allocation of Program revenue and staff time.

Also, prior to initiating any new data collection efforts, the Nongame Wildlife Program must consider how such new data will be managed and utilized. Such determinations should be made during the initial phase of project design to enhance the overall utility and quality of research or inventory efforts. When these considerations are not taken into account, 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.

The more than five years of data available for many of the waterbird nest sites includes counts or estimates of active nests and breeding pairs for each species nesting in a colony. Currently, these data are maintained in extensive manual files that continue to grow. The data are plagued with numerous reporting inconsistencies, caused in part by inadequate instructions for conducting the surveys and incomplete project design. Such problems have made it extremely difficult to analyze, summarize or computerize the information.

Finally, the Nongame Wildlife Program should develop a data system compatible with other computerized data bases (MLMIS, Phase I and Phase II inventories, etc.) and secondary sources of resource information collected

by other investigators. Considerable information already is available on many nongame species, often in published reports and journals. Although numerous computerized library search services are now available it is a major task to compile sources that are pertinent. The Nongame Wildlife Program must first determine what information is needed and, subsequently, how it will be stored and utilized. A decision must be made as to whether the Nongame Wildlife Program should serve as a repository that will centralize all statewide nongame resource information. Or, instead, should the Nongame Wildlife Program maintain only its own data and refer inquiries regarding other nongame resource information to other sources? Another important consideration in selecting the appropriate information management strategy is to assess not only the needs of the Nongame Wildlife Program but the needs of the entire Division of Fish and Wildlife and other Divisions within the Department for nongame resource information.

Actions to Date - Failure to address any one of the various aspects of the information management issue will result in the perpetuation of a cumbersome data storage and retrieval system that hinders the Nongame Wildlife Program's ability to provide information, identify resource needs, and design management actions. Consequently preliminary steps have been taken already to resolve this issue. The most significant action has been the incorporation of 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 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 identified and that public and private development projects would have the most up-to-date information available from which to plan.

Data that the Nongame Wildlife Program had collected on over 450 colonial waterbird nesting sites are catalogued in the computer and map files (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. One of the primary responsibilities of the Nongame 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 Natural 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, and annual population size of a species cannot be efficiently managed by the data system. A new system must be developed that permits efficient organization, retrieval and analysis of the additional information. A similar problem exists 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 are incompatible with the Natural Heritage data base and now are coded into a data file specifically for loons.

Although the statewide distribution data for rare species are

effectively organized by the Heritage system, the data base is extremely cumbersome for use with common species. The Natural Heritage data base cannot easily manage information summarizing habitat requirements, food habits, population dynamics, and state and national distribution, etc. for common species. The Nongame Wildlife Program must assess which of these data are important to maintain and must select an appropriate system (See Data Acquisition Issue).

In the past 10-15 years, numerous data management information systems have been developed. Most widely used 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 with cooperative funding provided by the U.S. Forest Service and the U.S. Fish and Wildlife Service. However, in the fall of 1982, 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 system, 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 own data management needs.

Actions necessary to resolve the administrative aspects of data management are still very preliminary. At present, nongame staff is recording the amount of time spent each day on different program functions such as public education, extension, survey, and technical projects. A cost-accounting code has been developed so that each program expenditure can be coded to a particular function. Within the coming year an accurate monthly report will be generated for each of the Program's project costs.

Future Considerations - The challenge for the Nongame Wildlife Program is to establish an information management system that will provide support for all of the program's functions, including budgeting, resource management, and strategic planning. Basic to the establishment of the appropriate data management system is the need to answer the simple question: "What information is needed and why?"

Opportunities to Resolve the Issue:

1. Design data handling systems specific for the Nongame Wildlife Program.
2. Support efforts to conduct a Division-wide assessment of the need for computerized data management systems, including the needs of the Nongame Wildlife Program and the Natural Heritage Program, to enhance the integration and coordination of such systems. Such an assessment should include input from USFWS and USFS.
3. Request assistance from the Wildlife/Forestry Task Force and the Bureau of Management Systems in the assessment and development of the Program's data management system.
4. 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.
5. 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.
6. Ensure that the data management system selected is compatible with existing data systems within the DNR.
7. Support the establishment of a library within the Department of Natural Resources.
8. Encourage and participate in agency efforts to determine and publicize the economic values of the state's wildlife resources.

ENDANGERED AND THREATENED SPECIES

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

Minnesotans' desire to maintain 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 other nongame populations 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 management for endangered species through legislation developed in the late 1960's which was revised and culminated in the Endangered Species Act of 1973 (16 USC, 1531 et sec). The 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 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 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 diversity of species (Langer 1984).

Following the federal example, Minnesota established legislation mandating state protection for endangered species in 1971 and entered into a limited authorities cooperative agreement with the U.S. Fish and Wildlife Service 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. 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. Further, Minnesota's legislation stated that those species designated under the federal law of 1973 as endangered in Minnesota - the Peregrine Falcon, Timber Wolf, Bald Eagle, and Higgin's Eye Pearly Mussel - would constitute the state's official list until the Commissioner exercised his authority to

develop a more comprehensive state list.

The state law also 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 for endangered species that may include research, census, law enforcement, habitat acquisition and maintenance, propagation, live-trapping, transportation, and regulated taking. Finally, the law permits exceptions to acts otherwise prohibited (Subd. 6). Because of these exceptions, the U.S. Fish and Wildlife Service has not yet approved Minnesota's application for a full authorities endangered/threatened plant cooperative agreement.

The first comprehensive list of state 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. 1983c, 6 MCAR Sec. 1.5600, and 8 state Req. 995 (Oct 31, 1983)).

The establishment of a state list is a great step forward and the benefits are many. The educational value of the list is most significant. 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 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. While the emphasis of all these efforts is on populations, the Nongame Wildlife Program also provides some funds to the Raptor Research and Rehabilitation Center at the University of Minnesota for the treatment of injured individuals of endangered and threatened bird species.

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 National 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

Nongame Wildlife Program is, therefore, one of determining how it can most effectively focus its personnel and monies to accomplish the inventory, monitoring, management, or recovery needed by these listed species. Where should the Program's emphasis be placed, particularly with regard to the efforts being expended by other groups and agencies.

Some guidance in this regard may be found in a statement by Odum (1982) 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."

Some efforts are underway to restore selected wildlife species in Minnesota. Two statewide programs have been initiated. Since 1982, a total of 35 peregrine falcons have been released in Minnesota and 16 trumpeter swans have been reared for eventual release. These projects involve cooperation among a variety of agencies and organizations.

On a regional scale, a number of extirpated populations have been restocked by Division of Fish and Wildlife personnel. From 1977-1980, approximately 90 prairie chickens were released at the Lac qui Parle Wildlife Management area near Watson, Minnesota. Twenty-three river otters from northern Minnesota were relocated in the Minnesota River drainage from Ortonville to Watson. The Hennepin County Park Reserve District initiated an osprey restoration project in Hennepin County in 1984. A number of future opportunities for wildlife restoration have also been identified and await evaluation (Mn. Dep. Nat. Resour. 1981).

Failure on the part of the Nongame Wildlife Program to address this issue might result in the extirpation of certain wildlife species, the destruction of habitat essential for the survival of the state's listed species, and a loss of citizen confidence in the DNR's commitment to its

legal mandates.

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. Update Commissioner's Order #1901 to reflect the 1981 legislative changes.
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 priority system to guide allocation decisions for listing, recovery, research, and protection activities. See Langer's (1984) discussion of the federal allocation model.
5. Implement the priority activities cooperatively with other programs (particularly the Natural Heritage and Scientific and Natural Areas Programs) which are similarly mandated to protect and manage the 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 an unlimited authorities cooperative agreement for plants and animals including invertebrates.
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.
10. Develop ongoing surveys of Minnesota flora and fauna to:
 - a) periodically re-evaluate and update status of species presently on the endangered, threatened, or special concern lists;
 - b) update those lists as warranted by current data;
 - c) develop a complete Minnesota checklist for all biota to provide a baseline for further studies.
11. Assess the feasibility and appropriateness of future reintroduction efforts for such species as swallow-tailed kites, woodland caribou, or whooping cranes which have been listed as extirpated statewide.

WILDLIFE HABITAT

Issue Statement: HIGH QUALITY HABITAT IS THE KEY TO WILDLIFE SURVIVAL.

Human land use decisions that convert, degrade, fragment, or contaminate wildlife habitats counteract or preclude actions to conserve wildlife populations. There is a need to sustain existing habitat management and protection programs and implement new actions that recognize nongame resource needs in order to minimize adverse land use and maintain habitat for wildlife.

Discussion: Minnesota's wildlife species diversity is unparalleled in the upper Midwest. This is a consequence of Minnesota's position in the heart of the continent where three major biomes - the tall grass prairie, eastern deciduous forest, and northern coniferous forest - converge, creating a wide variety of wildlife habitats. Man's use of the lands and natural resources of the state has altered these habitats, creating many of the present problems in wildlife conservation.

Habitat Destruction - The specific land use actions and their consequences for the wildlife resource in Minnesota have previously been discussed (Mn. Dep. Nat. Resour. 1983b). A number of habitat types have been converted to other uses and thus lost to wildlife because of land use practices. For example, almost all native prairie in the south central and southeastern Minnesota has been converted to agricultural land. Remnant prairies remain on railroad rights-of-way or in association with dry, rocky pastureland. 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 limit row crops.

Nevertheless, intensive grazing of these areas has severely degraded the native prairies, reducing their utilization by wildlife. Throughout the state, the implementation of strict fire suppression and prevention programs has allowed aspen and shrub to take over the remnant prairie.

Wildlife habitat is also facing numerous threats less obvious than direct loss. Degradation of northern softwater lakes from acid precipitation continues at an accelerating rate. Ground water, especially in the southern part of the state, is becoming increasingly contaminated with unknown consequences for wildlife. Lead shot contamination, with dire consequences to waterfowl, birds of prey, and other wildlife, continues. The need for a national regulatory mechanism to deal with lead shot toxicity is being neglected, and the federal government has not shown leadership in implementing a nontoxic steel shot program. Minnesota initiated its own steel shot program in 1977.

The wholesale application of herbicides for weed control on land and water and pesticide spraying for mosquitoes and other insects annually take their toll on wildlife and wildlife habitats. Exotic species, such as purple loosestrife, a European plant species, pose additional threats to certain 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.

The consequences for wildlife because of such conversion, degradation, and fragmentation of habitats is substantial. The Marbled Godwit and Greater Prairie Chicken are gone from most Minnesota prairies due to a lack of prairie parcels of sufficient size or quality. Other species like the Piping Plover have declined because their sandy beach habitat has been

preempted by recreational use, lake shore cabins, industrial development, and other non-compatible activities.

Fortunately, certain wildlife habitats have remained better protected than others due to their location or value for wildlife. The extensive peatlands of the north have not been converted to agriculture because of limitations caused by cold climatic conditions, saturated soils, and a short growing period. Current administrative policy, however, favors peatland development for alternative energy sources. Prairie potholes, though greatly diminished in extent, remain a sizeable habitat component in Minnesota because of state and federal programs to protect waterfowl habitat.

Habitat Protection Through Acquisition - Historically, habitat protection for wildlife consisted primarily of public land acquisition. Today, there are approximately 12 million acres of public land in Minnesota, located predominately in the northern, forested region of the state. Most of this property came into public ownership as a result of congressional land grants, county bankruptcies due to ill-advised drainage projects and tax forfeiture in the 1920's, and the establishment of state and national forests. The land remains forested, although the composition of the forest communities changes.

The first significant land acquisition effort in Minnesota specifically for wildlife began in 1951. It involved the acquisition of prairie marshes in western Minnesota through the Section of Wildlife's "Save the Wetlands Program," the first program in the nation to protect small wetlands. Subsequently the U.S. Fish and Wildlife Service began acquiring Waterfowl Production Areas. The approximately 545,000 acres of wetlands preserved represent the single largest acreage of acquired lands in Minnesota. 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.

Though such acquisition focused on waterfowl, the network of protected wetlands and adjacent uplands perpetuates habitat for numerous nongame species. However, some wetland species like the American Bittern declined when acquired habitat did not meet the critical size or composition necessary to sustain breeding populations.

In the 1960's, smaller acquisition efforts were initiated. These efforts on the part of private nonprofit organizations like The Nature Conservancy resulted in the protection of substantial acreages of native prairie habitat. Efforts by programs such as the DNR's Natural Heritage and Scientific and Natural Area Programs have also resulted in the identification and acquisition of habitats critical to certain nongame species, plant species, and plant communities ranked as statewide priorities. Though the primary focus was protection of plant communities, wildlife habitat was also protected.

Four areas of value primarily for nongame species have been acquired as a result of efforts by Division personnel with cooperative financing from the Division of Fish and Wildlife's Game and Fish Fund, the Nongame Wildlife Fund, the Minnesota 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 Hearing Island (Duluth Harbor, St. Louis Co.) are consequently now administered as wildlife management areas. Pine and Curry Islands in Lake of the Woods were acquired through land exchange. These lands are administered as a Scientific and Natural Area because of their

utilization for nesting by the Piping Plover, an endangered species.

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 the Long Lake heronry posted by the DNR under landowner easement to prohibit trespass during the nesting season.

In 1975, the Minnesota Legislature enacted the Resource 2000 program. This program provides funds, financed by general revenue bond sales, for acquisition and improvement of natural resource lands. The Resource 2000 program has accelerated the acquisition of lands for wildlife habitat purposes. However, the most recent legislation (Chapter 344, Session laws of 1982) re-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 legislation represents a compromise between consequence of an aversion to existing state land ownership on the part of some citizens and the need for additional acquisition.

Other Protection Alternatives - 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 like tax credits for native prairie and wetlands have postponed the destruction of certain wildlife habitats, at least for the time being. In addition, the Water Bank Program administered by the DNR has set aside wetlands and adjacent uplands through ten year lease agreements. The Department's Protected Waters and Wetlands Inventory program has also protected important habitat through regulatory control of draining, filling, vegetation removal, pumping, and development projects.

Similarly, new laws regulating the discharge of toxic substances into the water, air, and land have the effect of limiting negative impacts to remaining habitats. Section 404 of the Clean Water Act administered by the Army Corp of Engineers has protected considerable riparian habitat. The exercise of State regulatory authority over water appropriations and over wetland drainage also has benefited wetland wildlife. National and state legislation mandating assessment of the environmental consequences of major development actions has been another 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 does not exist to assure comprehensive evaluation and consideration of a site's 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. For the most part, public land management has been directed to wildlife habitat enhancement within the constraints of state, federal, and county objectives to derive economic returns from the lands. Such economic returns historically have been viewed as coming from timber resources, mineral resources, recreational activities and other resource commodities like 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 has been primarily for game species.

Many nongame species have benefited from management actions carried out on public lands for forestry or traditional wildlife objectives.

Nevertheless, actions directed to game species have also probably had negative impacts on some nongame species because of the traditional emphasis placed on increasing edge and setting back successional stages of community types.

Management emphasis on public land has shifted within the last 25 years as federal lands have come under comprehensive legal mandates to consider the needs of all wildlife. Similarly, in the last few years, state forest land managers have developed comprehensive procedures to build wildlife needs (including nongame) into the state's 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 Nongame Wildlife Program personnel and Department land managers to benefit nongame species have included such actions as the creation and protection of nest sites for piping plovers and common terns, nest platforms to restore a great blue heron rookery, prairie burning, and the establishment of bluebird nest box trails.

Habitat on Private Lands - Despite existing state and federal land use restrictions, environmental standards, and habitat acquisition or management programs, increasing amounts of wildlife habitat are degraded, altered or lost 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.

If wildlife habitat is to be maintained on private lands, other actions need to be identified, developed, implemented, and maintained. Such alternatives might include comprehensive local land use zoning and planning, new legislative regulations, increased enforcement, landowner education, tax incentives, and private land management programs. Cooperation with other county, state and federal programs needs to be strengthened, and policies and guidelines need to be adopted for the management of private lands consistent with enhancing the future for wildlife species.

Additionally, an ignorance of the possible economic value of wildlife also contributes to habitat loss, degradation, and conversion of private land for other purposes. Admittedly, powerful economic pressures influence private landowners, especially in the agricultural zone. As a result, many landowners will not give consideration to wildlife in land use decisions. By placing wildlife in a more favorable economic position, managers might provide enough incentive to sway some landowners' attitudes.

Future Considerations - A review of past acquisition and habitat management activities reveals a number of important considerations which must be addressed as the Nongame Wildlife 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. Land acquisition is expensive.

Perhaps other DNR programs, federal agencies or private organizations, either alone or in cooperation with the Nongame Wildlife Program, should acquire land necessary for the nongame resource. The most important role for the Nongame Wildlife Program relative to habitat protection may be to

define the habitat needs of priority nongame species, identify sites which require protection, and subsequently refer such sites 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 management assistance to enhance habitat for nongame species. The impact the Nongame Wildlife Program could have on 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 Nongame Wildlife Program needs to assess where the opportunity for significant improvement of habitat management and protection lies (on public or private lands) and where the Program's efforts should be focused. For instance, are current nongame wildlife conservation efforts paying enough attention to habitat loss and degradation on private lands? The Nongame Wildlife Program must determine how it can contribute on private lands relative to past 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 considering that there are no long term assurances that existing landowners will abide by the guidance provided? A major question is whether this service should be available for all habitats or whether it should focus only on specific critical habitats for rare species.

Such technical assistance or acquisition recommendations still may not assure protection of critical resources, as some sites may not meet the criteria of other acquisition programs. In some 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 Nongame Wildlife Program acquisition guidelines yet to be established. A failure on the part

of the Nongame Wildlife Program to participate in wildlife habitat protection and management programs may result in the decline or loss of populations of some nongame species.

Wildlife is a product of the land. The challenge is to maintain more wildlife on less habitat. Depending on land ownership, a number of alternatives 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. In some instances, acquisition of critical sites on private land may also be desirable. When addressing the issue of wildlife habitat, the Nongame Wildlife Program must develop a strategy considerate of all alternatives.

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. Monitor these habitats in order to quickly respond to negative changes that may occur. Develop a priority system to guide subsequent protection, enhancement, or development efforts.
2. Coordinate the identification of these critical habitats by working closely with the establishment of field inventory priorities for Natural Heritage staff plant ecologists.
3. Establish acquisition criteria and procedures to guide Nongame Wildlife Program.
4. Implement measures to protect key critical nongame wildlife

habitats, focusing on those habitats for endangered, threatened, or special concern species, including 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 to the significance of nongame species. Focus the review process on alternatives and mitigation to enhance projects.
6. Encourage the Division of Fish and Wildlife to 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 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 undesirable exotic species into Minnesota.
9. Encourage the federal government to assume vigorous toxic shot and acid precipitation prevention programs.
10. 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, and develop working agreements with federal agencies concerning nongame species management on federal lands.

11. Develop agreements with adjacent states concerning nongame species management.
12. Develop and implement formal working agreements and guidelines with other land management agencies or DNR Divisions to provide direction (such as the Private Forest Management Program of the Division of Forestry) and management assistance (technical services, seasonal crews, equipment, and management funds) concerning nongame species habitat needs on public and private lands.
13. 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.
14. Participation in 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. Cooperate, particularly with the U.S.D.A. Extension Service and the U.S. Soil Conservation in this regard.

15. 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.
16. Assess the applicability of the Habitat Evaluation Procedures (HEP) (U.S. Dep. Inter. 1980) or other procedures in order to establish the value of lands maintained as wildlife habitat.
17. Participate in existing programs 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 almost entirely from a single source, citizen donations to the Nongame Wildlife Fund. Additional state and federal monies or other funding have been limited. 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 \$35,000 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 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 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.

Minnesota also 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 checkoff revenue 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.

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 did taxpayers in any other state. The total amount

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%
% Taxpayers Receiving	82.00%	71.80%	62.9%
<u>Refund</u>			

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. 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 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.

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 groups 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 5.9% 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 preparers.

It would appear that some tax-preparers 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 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 (Boggis 1984), 2) divert funds to unrelated uses in state government, 3) add new checkoff items to the tax form for other purposes and thereby dilute the

effectiveness of the nongame wildlife checkoff (Applegate 1984, Boggis 1984), or 4) appropriate funds to wildlife-related activities which fall within the scope of the Nongame Wildlife Program 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 response to the intense debate which followed the most recent controversial proposal, Representative Skoglund introduced an amendment that prevents attempted diversions of checkoff money to unrelated purposes.^{1/} The amendment was passed.

The Department of Revenue has taken the position that any additional checkoffs would complicate the tax form and should be avoided. However, in 1984 two additional checkoff proposals were introduced in the Legislature. They did not pass, but they may be reintroduced in 1985. Oregon experienced approximately a 25% decline in nongame checkoff revenue when second checkoff was added to the tax forms in 1982.

Declines in funding need to be avoided to prevent the reduction or elimination of current projects. Maintenance of current revenues cannot be

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

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

It may be 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 dependent on the Legislature, is clear. The cause of the situation is, in part, the absence of direct state and federal financing for 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 that will supplement or match checkoff revenue. These sources could be derived in part through cooperative funding of special projects with other agencies statewide.

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

Other forms of financing to broaden and stabilize 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, or allocation of Pittman-Robertson and Dingell-Johnson funds to directly finance some nongame projects. The Fish and Wildlife Conservation Act of 1980 calls for an assessment of 18

alternatives for funding the 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 from Section 6 of the Endangered Species Act 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. Securing longer term funding may be 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 from 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 influence 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. Concurrently, a broadening of the Fund's base of support must be accomplished 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) a description of the present participants and delineation of new contributors;
 - c) a determination of motivation for current citizen participation;
 - d) an identification of weak links in the existing promotion network and of opportunities for additional organizations/individuals to participate in promotion.
2. See opportunity 11 page 17 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 Wildlife Habitat and Data Acquisition).
4. Investigate the applicability of the Habitat Evaluation Procedures or other procedures in order to establish the value of lands maintained as wildlife habitat.
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. Urge Congressional support to fund the Fish and Wildlife Conservation Act of 1980 to provide

nongame funds to the states.

7. Investigate and evaluate new methods to broaden the long-term funding base of the Nongame Wildlife Program, such as General Fund or corporate monies to match citizen donations.
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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