Conservation of Aquatic Critical Habitats in North Carolina

John M. Alderman, *North Carolina Wildlife Resources Commission, 512 N. Salisbury Street, Raleigh, NC 27604-1188*

Randall C. Wilson, *North Carolina Wildlife Resources Commission, 512 N. Salisbury Street, Raleigh, NC 27604-1188*

Christopher McGrath, *North Carolina Wildlife Resources Commission, 512 N. Salisbury Street, Raleigh, NC 27604-1188*

Abstract: North Carolina's State Endangered Species Act for Animals was established in 1987. Since that time, approximately 200 species have been listed as endangered, threatened, or species of special concern. The act, however, provides few ways to prevent take of these species or to conserve the listed species' habitats. Therefore, state regulatory agencies have been establishing procedures for conserving wetland and aquatic endangered and threatened species. Approximately half of the listed species are aquatic; therefore, significant aquatic habitat conservation is expected during the next decade.

Proc. Annu. Conf. Southeast. Assoc. Fish and Wildl. Agencies 47:348–352

From 1980 through the year 2000, North Carolina's human population is projected to grow from 5.9 million to 7.6 million. During this period, the population density will grow from 43 to 56 citizens per square kilometer (U.S. Bur. Census 1983, 1990).

The increasing use of the state's natural resources via development projects, reservoir construction, highway construction, waste processing, and other activities will continue to cause loss of wildlife habitat. To some extent, the number of state endangered, threatened, and special concern species is one measure of past human impact on wildlife habitat. North Carolina's state list of protected animals will soon exceed 200 species. Roughly half of these are aquatic species. Half of North Carolina's approximately 70 freshwater mussel species and a quarter of the approximately 225 freshwater fish species are state-listed. Better management of protected species' habitats would conserve not only these species but also other components of properly functioning ecosystems.

The North Carolina Wildlife Resources Commission (NCWRC) is responsible for identifying critical habitats for state-listed endangered and threatened species.

Once an aquatic critical habitat is identified, the NCWRC can request that the North Carolina Environmental Management Commission (NCEMC) designate it as high quality waters, and the habitat then will receive special protection from the state. This process takes place in 3 stages. Each stage requires citizen input through the public hearing process.

Methods for Designating Critical Habitats

In the first stage, the NCEMC adopts definitions and rules for the protection of high quality waters. These definitions and rules include provisions for the conservation of NCWRC designated critical habitats as high quality waters.

The second stage requires that the NCWRC develop definitions and rules to allow designation of critical habitats. A critical habitats subcommittee is formed. Members include NCWRC nongame staff and heads of all scientific councils charged with developing basic definitions for critical habitats and with identifying the state's endangered, threatened, and special concern animals. The critical habitats subcommittee's charge is to identify all aquatic critical habitats for state listed endangered and threatened species. These critical habitats are considered essential for the conservation of these species. The NCWRC's Nongame Wildlife Advisory Committee would receive a report from the Critical Habitats Subcommittee which recommends definitions for critical habitats and areas to be designated as critical habitat by the NCWRC. The Nongame Wildlife Advisory Committee will review the documents, make recommendations for modifications, and recommend that the modified documents be forwarded to the NCWRC for consideration and adoption. The NCWRC will then consider adoption of the definitions for critical habitats and designation of critical habitats. The NCWRC can then recommend to the NCEMC that these critical habitat areas be designated high quality waters of the state.

The third stage requires the NCEMC to designate NCWRC critical habitats as high quality waters.

Results

The first stage in critical habitat conservation has been completed by the NCEMC. High quality waters regulations apply to new or expanded wastewater discharges (NCEMC 1992). Effluent limitations for oxygen consuming wastes are 5-day biological oxygen demand (BOD) = 5 mg/l, ammonia and total nitrogen (NH_3-N) = 2 mg/l, and dissolved oxygen (DO) = 6 mg/l. More stringent limitations will be set, if necessary, to ensure that the cumulative pollutant discharge of oxygen-consuming wastes will not cause the DO of the receiving water to drop more than 0.5 mg/l below background levels, and in no case below the standard. Total suspended solids will be limited to 20 mg/l. Failsafe treatment designs will be employed, including stand-by power capability for entire treatment works, dual train design for all treatment components, or equivalent failsafe treatment designs. The total volume of treated wastewater for all discharges combined will not exceed 50% of the total instream flow under 7Q10 (the 10-year minimum average flow for

7 consecutive days) conditions. If required, appropriate effluent limitations will be set for phosphorus or nitrogen or both. In general, only the discharge of domestic (multi-family) or non-process industrial wastewater will be permitted. A sedimentation / erosion control plan will be required for high density development projects on lands which drain to and are within 1.6 km of high quality waters. Such plans will also be required for other projects where necessary to protect the existing uses present in the high quality waters.

The first 2 steps of the second stage have been completed by the NCWRC. In order for an area to be designated as critical habitat, the NCWRC determined that the following 4 definitions or conditions must be met:

(1.) "Critical habitat" shall mean any habitat which is considered essential for the continued survival of an endangered or threatened wildlife species.

(2.) Critical habitats shall be recommended for Commission adoption by the Nongame Wildlife Advisory Committee based on sound biological evidence.

(3.) Critical habitats shall include those areas within the geographical area occupied by an endangered or threatened species on which are found physical or biological features which are essential to the conservation of the species and which may require special management considerations or protection. A given critical habitat may also include specific areas outside the geographical area occupied by an endangered or threatened species that are determined to be essential for the conservation of the species and which may require special management considerations or protection.

(4.) Critical habitats shall not necessarily include the entire geographical area which can be occupied by a threatened or endangered species unless the management and protection of the area has been determined to be essential for the conservation of the species.

Using this formula and given the known ranges and health of various endangered and threatened species' populations, 34 aquatic critical habitat areas have been recommended for NCWRC designation. These proposed critical habitats include only the listed freshwater mullusks (n = 21) and fish species (n = 3) in North Carolina. State listed fish and crustacean species were not available when the first critical habitats package was being developed. The 34 proposed critical habitats are found throughout the state's major physiographic provinces: Mountains, Piedmont, and coastal plain. Among the 34 proposed critical habitats are significant subbasins in 9 river basins: the New (Mountains), Watauga, Little Tennessee, Catawba, Pee Dee, Waccamaw, Cape Fear, Neuse, and Tar. Most of the proposed critical habitats are cluster areas for several endangered, threatened, or special concern species. In general, these areas also have high species diversity and significant sport fish and game animal populations.

Discussion

High quality waters designations of critical habitats is only 1 layer of protection being developed in North Carolina to conserve state and federally listed endangered and threatened species. It is required since activities associated with some land uses, such as agriculture and forestry, are not addressed by high quality waters regulations.

In the future, river basins will be managed by the North Carolina Division of Environmental Management on a basinwide scale to better manage point and nonpoint sources of pollution. Part of this effort is to expand protection of highly valued resource water (including high quality waters) by limiting input of wastewaters and by implementing best management practices to reduce sediment and nutrient runoff. The first comprehensive management plan is being developed for the Neuse River Basin (N.C. Div. Environ. Manage. 1992*a*) which covers 12% of the state and contains 6 of the proposed critical habitat subbasins. Other management plans will be developed in the near future for other river basins.

Still another layer of protection is being developed for the Albemarle-Pamlico Estuarine Area which covers parts or all of 35 counties in eastern North Carolina (Albemarle-Pamlico Estuarine Study 1992). Major river basins involved include the Neuse, Pamlico, Roanoke, and Chowan. Eleven of the 34 proposed critical habitats are in the Albemarle-Pamlico Estuarine Area. Control of point and nonpoint sources of pollution are emphasized on a region-wide basis. One of the major goals is to protect rare natural communities and habitat essential to the survival of rare species.

Wetlands associated with high quality waters may also receive special protection in the near future. The North Carolina Division of Environmental Management (1992*b*) is considering rules required to conserve wetlands adjacent to high quality waters. For such wetlands, a project must be water dependent before it can be permitted. If a permit is issued, mitigation for the loss of these wetlands requires replacement at an acreage ratio of 4:1 within the same river sub-basin.

Private conservation organizations are becoming involved in the conservation of aquatic critical habitats. A conceptual protection plan for the upper Tar River has been developed for the North Carolina Nature Conservancy (Roe 1992). Numerous strategies are included in 6 major goals. These goals include making the protection of the Tar River Basin's critical habitats a priority project of The Nature Conservancy, expanding public education of the significance of the river basin, completing a systematic inventory of rare aquatic species populations, developing a river management plan, helping to implement management recommendations of the Albemarle-Pamlico Estuarine Study, and securing long-term ecological protection of significant areas in the river basin. Such goals should complement the U.S. Fish and Wildlife Service's (USFWS) plans to make the conservation of the Tar River Basin a priority USFWS project.

Conservation of aquatic critical habitats in North Carolina is consistent with recommendations developed at the North American Fisheries Leadership Workshop (Harville 1991). The top priority for management and allocation of resources required for a vision for North American fisheries into the 21st century was the following:

> Aquatic resources are managed for long-term sustainability on a holistic, ecosystem basis. Intrinsic and ecological values are of primary importance, and healthy fisheries to meet human needs are being maintained within those guidelines. Biodiversity remains undiminished.

Another high priority under short-term and long-term issues and strategies was conservation of habitat. Specifically, under long-term issues and strategies, 3

major goals for the next several decades are to protect existing habitat, to develop an ecosystem approach to habitat protection, and to identify and prioritize habitats for restoration and acquisition throughout all ecological regions of North America. The identification and conservation of critical habitat areas in each state, which usually are the best representatives of properly functioning ecosystems, give conservation agencies their best hope for fulfilling the goals of the North American Fisheries Leadership Workshop. Such areas will provide the diverse genetic resources required for future restoration projects in improved aquatic habitats.

Literature Cited

Albemarle-Pamlico Estuarine Study. 1992. The second public draft of the comprehensive conservation management plan of the Albemarle-Pamlico Estuarine Study. 355pp.

Harville, J. P., ed. 1991. Proceedings of the North American Fisheries Leadership Workshop. Am. Fish. Soc., Bethesda, Md. 32pp.

North Carolina Division of Environmental Management. 1992*a*. Draft Neuse basinwide water quality management plan. 112pp.

———. 1992*b*. Position paper: Conceptual Wetland Rules. 7pp.

North Carolina Environmental Management Commission. 1993. Administrative Code Section: 15A NCAC 2B .0100 and 15A NCAC 2B 0200. Raleigh, N.C. 35pp.

Roe, C. E. 1992. Upper Tar River, North Carolina, conceptual protection plan. Report and recommendations to North Carolina Nature Conservancy by the Conservation Trust for North Carolina. Contr. Rep. 124pp.

U.S. Bureau of the Census. 1983. 1980 Census of the population. Washington, D.C.

———. 1990. Population estimates and projections. Ser. P-25, No. 1053. Washington, D.C.