

CONSERVATION PRIORITIES AND OPTIONS

The forty sites identified in this inventory clearly vary in terms of their significance. On the one hand are the sites on the lower Rocky and Deep Rivers, which deserve national recognition due to the number of globally rare species they contain. On the other are sites like Hinson Hill, which contain no known rare species nor even extensive stands of mature forest, but which may be nonetheless quite important on a local level as reservoirs for wildlife. The sites also vary in terms of their degree of current protection, immediacy of threats, and feasibility of protection. All these factors must be considered in assigning priorities for conservation efforts.

BIOLOGICAL SIGNIFICANCE OF THE SITES

As indicated in Table VI, the sites can be divided into four categories of biological importance. The top three categories were determined according to the rating scheme developed by the Natural Heritage Program and The Nature Conservancy. The main criteria used to rank sites in these categories are the presence of rare species or outstanding examples of uncommon community types. For the county level, there are no prescribed methods for ranking the sites, but size and integrity of the site, the presence of exemplary, if common communities, and the presence of healthy populations of certain indicator species are useful criteria.

For a site to be considered nationally significant, it must include populations of at least one globally rare species (ranked as either G1 or G2 -- see Table II). The lower reaches of the Rocky and Deep Rivers easily qualify for this distinction, there being at least three such species present, as well as a number of state-listed species. Under our somewhat arbitrary partitioning of this area (based primarily on differences among terrestrial communities and type of ownership), there are three contiguous sites within this system that deserve national significance, since they contain collectively the largest known populations of both the Cape Fear shiner and Septima's clubtail dragonfly. The Deep River Harperella bar contains, in addition, a population of the federally-endangered harperella.

Only one other site in Chatham County, the New Hope Point Eagle Roost, is assigned national-level priority. Although the bald eagle has recovered to the point where it is now ranked as only a G3 species, it is still federally-listed as endangered. The site occupied by this species on Jordan Lake also achieves national significance as one of the largest summer roosting areas for eagles in the entire eastern United States. As such, it may play an important role in the restoration of this species throughout this part of the country. Within North Carolina, moreover, it may serve as a nucleus for the recovery of the state's breeding population, which is presently still minuscule.

Five sites are listed in Table VI as possessing state-level significance. In the first two cases, the sites contain populations of the globally rare Septima's clubtail dragonfly, but smaller ones than present at the sites described above. These two sites, as well as Wood's Mill

Table VI SUMMARY OF SITE SIGNIFICANCE

SITE NAME	REASONS FOR SIGNIFICANCE
Nationally Significant:	
Deep River Harperella Bar	3 globally rare species
White Pines Promontory	2 globally rare species
Rocky River Dragonfly Riffles	2 globally rare species
New Hope Point Eagle Roost	1 federally endangered species

State Significant:	
902 Laurel Bluffs and Mussel Beds	1 globally rare species 2 state rare species
Duke Forest/Haw River Levees and Bluffs	1 globally rare species 1 state rare species
Wood's Mill Bend	1 state rare species
Bear Creek	1 state rare species
Donnelly Hardpan Bog	1 state rare community 1 state rare species

Table VI CONTINUED

SITE	REASONS FOR SIGNIFICANCE
Regionally Significant:	
Indian Creek Diabase Slope	2 state rare species, 1 regionally rare community
Lessler Montmorillonite Forest	2 state rare species, 1 regionally rare species, 1 regionally rare community
Haw River Dicentra Slopes	1 state rare species, 1 regionally rare species, 1 regionally rare community
Old Railroad Heath Glades	1 state rare species, 1 regionally rare community
Lagrange Diabase Bog	1 regionally rare community
Roberson Creek Ravine	1 regionally rare community

Table VI CONTINUED

SITE	REASONS FOR SIGNIFICANCE
County Significant (with rare species):	
Buckhorn Bluffs and Levees	1 state rare species exemplary community
Old Quarry Creek	1 state rare species exemplary community
Morgan Creek Bottomland Forest	1 state rare species exemplary community wildlife reservoir
Weaver Creek Old-growth Pinewoods	1 state rare species exemplary community
New Hope Audubon Wildlife Observation Area	1 state rare species
Cub Creek Bottomlands and Beaver Ponds	1 state rare species wildlife corridor
Little Terrells Creek Bottomland Forest	1 state rare species exemplary community

Table VI CONTINUED

Site	Reasons for Significance
County Significant (without rare species):	
Rock Rest Mafic Islands and Shore	exemplary community wildlife corridor
Windfall Branch Hardwood Slopes	exemplary community
Terrells Mountain	exemplary community
Bennett Mountain	exemplary community
Little Indian Creek Galax Bluff	exemplary community
North Edwards Ridge	exemplary community
Rocky River Basalt Bluffs and Levees	exemplary community
Sapling Ridge	exemplary community
Shadox Creek Felsic Glades and Bottoms	exemplary community
Silk Hope Inselberg	exemplary community
Terrells Creek Galax Bluffs	exemplary community
Big Woods Wilderness	wildlife reservoir
Boothe Hill	wildlife reservoir
Collins Mountain	wildlife reservoir
Hinson Hill	wildlife reservoir
Northeast Creek Wildlife Area	wildlife reservoir
Pittsboro Firetower Wilderness	wildlife reservoir
Herndon Creek Ravine	wildlife corridor

Bend, also once provided habitat for the Cape Fear shiner, although that species is either now absent or present in only low numbers in these reaches. The main reason these sites were not elevated to national significance is due to obvious signs of habitat degradation; in their current state they clearly do not belong on the same level as the sites described above. At the state-level, however, these sites are significant not only for their global rarities, but also for the state-rare species they contain, particularly several rare freshwater mussels in the case of the Rocky River sites, and the buttercup phacelia at the Haw River site.

Apart from these riverine areas, the Donnelly Hardpan Bog is the only other Chatham County site meriting state-level significance. This site contains not only a large population of the four-toed salamander, state-listed as special concern, but also an excellent example of the Upland Pool community, a habitat type that is quite rare throughout the state.

The six sites ranked as regionally rare in Table VI also contain high quality examples of rare communities, but of types that are rare within the region, not the state as a whole. Four of these sites additionally possess state-rare species, but none ranked higher than S2. Although these sites would be given the lowest priority for protection by the Natural Heritage Program or the Nature Conservancy, they are nonetheless quite worthy of protection by local efforts. To emphasize this point, the White Pines Natural Area would itself fall into this category if it had not been linked to the nationally important aquatic habitats adjoining it. It is nonetheless highly valued by the region's citizens, as is attested by the support given to the Triangle Land Conservancy for its protection. As an impressive relict of the Ice Age, it additionally possesses high scientific value.

The remaining 25 sites are also worthy of local conservation efforts, even though most of them fall completely below the cutoff for priority ranking by the Natural Heritage Program. This category includes two main subdivisions. The majority of these (18 sites) contain exemplary instances of community types that are either common or at least fairly widespread in this region. This group includes sites like Bennett Mountain, with its old-growth stand of the relatively common Dry Oak--Hickory Forest, as well as Terrells and Edwards Mountain with their mature Piedmont Monadnock Forests, a more localized community type. Communities in this group were judged to be exemplary primarily on the basis of the maturity and diversity of their forests, as well as their lack of disturbance, i.e., habitat integrity. Some of these sites contain state-rare species, and most, if not all, contain healthy populations of species that serve as indicators of high quality habitat, including hooded warblers, ovenbirds, box turtles, and other species vulnerable to forest fragmentation.

The second group of sites significant at the county level are primarily important as wildlife habitat. These sites also contain tracts of mature forests, but mainly small or scattered patches within larger areas of young second growth hardwoods, pine stands, or even clear-cuts. The prime distinguishing feature of all these sites is their size; most are over 100 acres in extent and several contain several thousand acres. They are also all connected with other such areas by corridors of continuous forest habitat, and are thus part of a network of wildlife habitats extending through the entire region.

Although with the exception of the cooper's hawk, no truly rare species are likely to be found in these recently disturbed woodlands, these tracts provide the last stronghold for the wildest species remaining in Chatham. Only in these large tracts are there still viable populations of bobcat and wild turkey, for example. They also provide habitat for such other wide ranging species as broad-winged and red-shouldered hawks, great horned and barred owls, pileated and hairy woodpeckers. As these forests become increasingly whittled away by development, many of these species will join the black bear, mountain lion, and wolf as species for which there was simply too little room to coexist with the human population.

DEGREE OF CURRENT PROTECTION

Just as the sites vary greatly in terms of their biological importance, there are also significant differences in their current protection status, which is determined primarily by ownership. As shown in Table VII only a handful of sites have any degree of formal protection.

Just nine of the forty sites identified in this inventory occur partly or wholly on public lands; all of these sites are located on Corps of Engineers property around Jordan Lake. Only four of these sites, moreover, are registered with the Natural Heritage Program as State Natural Areas, which gives them some added degree of protection. The rest, including the New Hope Point Eagle Roost, are currently designated as state gamelands and are open not only to hunting but potentially to commercial timbering. While some degree of extra protection is extended to the immediate area surrounding the nesting and roosting sites of the bald eagles on the New Hope Peninsula, the restrictions on human activities in this area vary with the seasons and rely primarily on voluntary compliance.

Apart from these federally-owned sites, only one other site, Terrells Mountain, is in partial public ownership. The summit of this monadnock is the site of the transmission towers for the public radio and television stations operated by the University of North Carolina. A large part of the summit has additionally been developed for private residences. Currently, only a few areas of prime Piedmont Monadnock Forest and Dry Oak--Hickory Forest remain on the mountain, and no plans are known to exist for their protection.

Far better protected than any of the publically-owned sites, are two natural areas owned by private conservation organizations. The White Pines Natural Area (part of the White Pines Promontory of this report) is largely owned by the Triangle Land Conservancy and has been dedicated as a State Nature Preserve, giving it the highest level of protection for any site in Chatham County (see Conservation Options below). Portions of this area that are still owned by private citizens have also been protected through conservation easements given to the Triangle Land Conservancy. The Donnelly Hardpan Bog, owned by the North Carolina Nature Conservancy, may also become dedicated as a State Nature Preserve or registered as a State Natural Area. This site is currently designated as a Nature Conservancy Reserve and managed in such a way as to protect its natural values.

Table VII SUMMARY OF SITE OWNERSHIP

A. Sites on Public Lands

Site Name	Ownership	Township
Weaver Creek Old-growth Pinewoods*	Federal (COE)	Cape Fear
Windfall Branch Hardwood Slopes*	Federal (COE)	New Hope
Morgan Creek Bottomland Forest	Federal (COE)	Williams
New Hope Audubon Wildlife Observation Area	Federal (COE)	Williams
New Hope Point Eagle Roost	Federal (COE)	Williams
Northeast Creek Wildlife Area	Federal (COE)	Williams
Roberson Creek Ravine*	Federal (COE) and Private	Center
Old Quarry Creek*	Federal (COE) and Private	Williams
Terrells Mountain	University of North Carolina and Private	Baldwin

* Registered as a State Natural Area

Table VII CONTINUED

B. SITES OWNED BY INSTITUTIONS OR FOUNDATIONS

Site Name	Ownership	Township
White Pines Promontory**	Triangle Land Conservancy, State Waters, & Private	Oakland
Donnelly Hardpan Bog*	The Nature Conservancy	Matthews
Duke Forest/Haw River Bluffs and Levees	Duke University, State Waters, and Private	Center, Baldwin and New Hope

* Registered as a State Natural Area

** Dedicated as a State Nature Preserve

Table VII CONTINUED

C. SITES IN PRIVATE OWNERSHIP BUT POSSESSING STATE WATERS

Site Name	Township
Rock Rest Mafic Islands and Shore	Baldwin and Hadley
Buckhorn Bluffs and Levees	Cape Fear
Rocky River Dragonfly Riffles	Center, Hickory Mountain, and Oakland
Haw River Dicentra Slopes	Haw River
Rocky River Basalt Bluffs and Levees	Hickory Mountain
902 Laurel Bluffs and Mussel Beds	Hickory Mountain
Wood's Mill Bend	Hickory Mountain and Matthews
Deep River Harperella Bars	Oakland

Table VII CONTINUED

D. SITES THAT ARE COMPLETELY PRIVATELY OWNED

Site Name	Township
Silk Hope Inselberg	Albright
Bennett Mountain	Baldwin
Collins Mountain	Baldwin
Little Terrells Creek Bottomland Forest	Baldwin
Old Railroad Heath Glades	Bear Creek
Hinson Hill	Bear Creek and Matthews
Shaddox Creek Felsic Glades and Bottoms	Cape Fear
Lessler Montmorillonite Forest	Center
Pittsboro Firetower Wilderness	Center
Indian Creek Diabase Slope	Gulf
Lagrange Diabase Bog	Gulf
Little Indian Creek Galax Bluff	Gulf
Bear Creek	Gulf and Oakland
Sapling Ridge	Hadley
Terrells Creek Galax Bluffs	Hadley
Big Woods Wilderness	New Hope and Williams
Boothe Hill	Williams
Cub Creek Bottomlands and Beaver Ponds	Williams
Herndon Creek Ravine	Williams
North Edwards Ridge	Williams

One other institutionally-owned area included in this survey is the tract of Duke Forest that extends along both banks of the Haw River between Bynum and Jordan Lake. Although this site has not been designated as a natural area by Duke University, neither has it been managed for timber production as have other sections of the Forest in Orange and Durham Counties. Unfortunately, this extremely important strip of riparian forests, floodplains, and steep slopes is very narrow, and the adjoining privately-owned lands extend in some places to within ten to twenty yards from the Haw River. Several of these adjacent tracts have been recently clear-cut.

The remaining 28 sites are owned by private citizens, timber companies, and development corporations. None of these sites currently has any form of official protection and all are potentially vulnerable to clear-cutting, road-building, sewer-line construction, and residential or commercial development. Only in eight cases does the State of North Carolina claim ownership of the waters that flow through the property; a county ordinance also provides some degree of protection for these streamside areas.

THREAT STATUS

Whatever the nature of their ownership, registration, or dedication, none of the forty sites identified in this inventory should be considered absolutely free from threats to their natural features. For instance, the Ice Age relicts present at the White Pines Natural Area -- the best-protected site in the county -- are highly vulnerable to the effects of global warming, and the nationally-significant aquatic habitat that it contains is completely at the mercy of pollution and siltation originating twenty miles or more upstream. The degree of threat to this or any other site thus varies somewhat independently of protection status, as can be seen by comparing Tables 7 and 8.

Among the most threatened sites in the county are the nationally- and state-significant aquatic habitats in the Rocky, Deep, and Haw Rivers. As discussed previously, some of their species have already been extirpated and several more are currently in great jeopardy, including two species on the Federal Endangered Species List. Also highly threatened is the bald eagle roosting, foraging, and nesting area located at the north end of Jordan Lake. Recreational uses of the area north of SR 1008 are increasing dramatically; water- and jet-skiers can be seen roaring past the eagle observation platform on any weekend during the warmer part of the year. The protection plan currently being implemented for the one known nesting pair only provides seasonal protection for two existing nest sites. Given the growth of recreational activities in this part of the lake, it is unlikely that any further sites will remain suitable for the expansion of the eagle population.

Another three sites are under immanent threat due to road construction. In the case of the Haw River Dicentra Slope, the complete obliteration of the site itself is a distinct possibility, whereas in the other two the main threat arises more from habitat fragmentation and secondarily from increased development fostered by road construction. Most of the upland sites in the county can be counted in this category, either now or the near future.

Table VIII THREAT STATUS OF THE SITES

A. Highly Threatened Sites

Site	Threat
Deep River Harperella Bars	Siltation and water pollution; timbering
Rocky River Dragonfly Riffles	Siltation and water pollution; timbering
White Pines Promontory	Siltation and water pollution; timbering and residential development of adjacent tracts
902 Laurel Bluffs and Mussel Beds	Siltation and water pollution; timbering
Wood's Mill Bend	Siltation and water pollution; timbering and residential development
Rocky River Basalt Bluffs and Levees	Siltation and water pollution; timbering
Bear Creek	Siltation and water pollution; timbering and residential development
Duke Forest/Haw River Levee Forest and Slopes	Siltation and water pollution; timbering of adjacent tracts; unauthorized ORV trails
New Hope Point Eagle Roost	Increased recreational usage of eagle nesting and foraging area
New Hope Audubon Wildlife Observation Area	Increased recreational usage of eagle foraging area
Haw River Dicentra Slope	US 1 widening
Pittsboro Firetower Wilderness	US 64 realignment and residential development
Lessler Montmorillonite Forest	US 64 realignment
North Edwards Ridge	Residential development
Terrells Mountain	Residential development and expansion of radio and TV facilities
Bennett Mountain	Residential development and timbering
Boothe Hill	Residential development and timbering
Collins Mountain	Residential development and timbering
Big Woods Wilderness	Residential development and timbering
Herndon Creek Ravine	Residential development and timbering
Cub Creek Bottomlands and Beaver Ponds	Timbering; residential development of adjacent tracts
Hinson Hill	Timbering

Table VIII CONTINUED

B. Moderately Threatened Sites:

Site	Threat
Shaddox Creek Felsic Glades and Bottoms	Timbering
Old Railroad Heath Glades	Timbering
Rock Rest Mafic Islands and Shore	Timbering
Sapling Ridge	Timbering
Little Indian Creek Galax Bluff	Timbering
Silk Hope Inselberg	Timbering
Morgan Creek Bottomland Forest	Timbering
Little Terrells Creek Bottomland Forest	Residential development of adjacent area
Buckhorn Bluffs and Levees	Timbering of adjacent areas
Lagrange Diabase Bog	Grazing

C. Minimally Threatened Sites:

Site	Threat
Northeast Creek Wildlife Area	Timbering and creation of subimpoundments
Roberson Creek Ravine	Timbering of adjacent tracts
Old Quarry Creek	Timbering and residential development of adjacent tracts
Terrells Creek Galax Bluffs	Timbering of adjacent tracts
Indian Creek Diabase Slope	Grazing
Donnelly Hardpan Bog	Illegal dumping
Weaver Creek Old-growth Pinewoods	None known
Windfall Branch Hardwood Slopes	None known

The majority of the sites (22) are threatened to varying degrees either by residential development, timbering, or some combination thereof. In the case of Edwards and Terrells Mountains, there is a significant chance that most of the natural area will be usurped for human uses. In others, such as the Terrells Creek Galax Bluffs, the threat is not directly to the natural area itself but to adjacent tracts needed as a buffer or for wildlife movements.

Timbering alone is usually less threatening than residential development, since its effects are ultimately more reversible. In some cases, however, the clearcutting has been so extensive that recovery will be extremely slow. Wherever we found sites where adjoining tracts had been widely cleared, we judged the degree of threat to be quite high.

For only a minority of sites did we judge the degree of threat to be fairly low. All these sites are either in public ownership and registered as State Natural Heritage Areas, or they are owned by landowners who are sympathetic to preserving their tracts in a natural state. Only two sites appear to be threatened by no known factors, but these sites are also already depauperate in terms of sensitive species.

CONSERVATION OPTIONS

A variety of options exist for conserving natural areas and endangered species, ranging from local landowner initiatives to the federal Endangered Species Act. In all cases, conservation works best when citizens are well-informed about the value of their natural heritage and take an active role in its preservation. In this spirit, governmental acquisition of natural areas by right of eminent domain is not one of the options we include here. On the other hand, since environmental problems tend to spill across both property and political boundaries, we do believe that planning, zoning, and land-use regulations have an important place in conservation, especially if they are supported by the local citizenry.

LANDOWNER INITIATIVES

The majority of Chatham County's natural areas are privately owned and will undoubtedly remain so. Conservation of these sites in particular will require not only the good will but the active participation of the landowners. Although in many cases, the sites have remained in a natural state because the owners are already aware of their value, the owners may not know of the many options that can make conservation management more effective and less financially burdensome¹⁵.

¹⁵ Most of the options described in this section are covered in more detail in C.R. Roe's **The Landowner's Options for Natural Heritage Protection: A Guide to Voluntary Protection of Land in North Carolina**. This pamphlet is available from the North Carolina Natural Heritage Program.

For the large tracts of privately-owned woodlands that are primarily of value as wildlife habitat and open space, the recommended option is to continue to use them for forestry (the other alternatives usually being development or cultivation). However, management plans should be modified, if necessary, to move away from the clear-cutting of large tracts for short-term gain or the conversion of relatively natural woodlands to loblolly pine plantations. We advocate instead the use of selective harvesting, shelter woods, and other practices that reflect the greater values inherent in long-term stewardship and true multiple use.

One state program that offers assistance in achieving these goals is the NC Forest Stewardship Program sponsored by a number of different state and federal agencies¹⁶. This program is open to any non-industrial private forest landowner holding a minimum of ten acres of forest-land, and offers assistance in achieving any of the six following stewardship goals: 1) maintenance of forest health and productivity, 2) improvement of fish and wildlife habitat, 3) protection of water quality, 4) enhancement of soil productivity and minimization of erosion, 5) maintenance and enhancement of aesthetic value, 6) support for recreational activities. Examples of the management plans this program encourages include controlled burning, re-forestation in natural vegetation, planting of mast-producing trees, construction of nest boxes, and maintenance of vegetated buffer strips along watercourses.

Each Forest Stewardship management plan is tailored to the individual desires of the landowner and need involve only three of the objectives listed above. Enrollment in the program is entirely voluntary and consists of a pledge by the landowner to abide by the plan. In return for enrolling in the program, the forest owner receives professional assistance in formulating a five year stewardship plan. Such assistance may be either free of charge, if obtained from the local county Stewardship Committee, or may be accomplished through a cost-share arrangement with the Program if a private natural resources consultant is contracted to do the job. Additional cost-share programs and financial incentives are available for implementing the plan. The landowner is also recognized and honored for their participation in the Forest Stewardship Program and may receive property tax benefits due to a reduction in current use to the base level.

Although certain tracts of forest may be left in a completely natural state under a Forest Stewardship Plan, enrollment in the program assumes that at least part of the property will continue to be used for profit, by timber production, hunting leases, recreation, or some other use. For owners who wish to preserve their entire tract in a natural state (including owners of less than the minimum of ten acres required for the Forest Stewardship Program),

¹⁶ For more information, write to: Forest Stewardship Coordinator, Archdale Building, Box 27687, Raleigh, NC 27611-7687. Local representatives of the following participating agencies may also be contacted directly: NC Cooperative Extension Service, NC Division of Forest Resources, NC Wildlife Resources Commission, NC Division of Soil and Water Conservation, USDA Soil Conservation Service, Agricultural Stabilization and Conservation Service, and USDA Forest Service.

another option is to register the site as either a state or local natural area. The North Carolina Registry of Natural Areas Program, administered by the Natural Heritage Program, is available for any site possessing rare species, significant ecosystems, or other exceptional natural values¹⁷. For sites located in Chatham County and elsewhere in the Triangle region, the Triangle Land Conservancy Stewardship Awards Program provides similar registry for sites of primarily local value¹⁸. Unlike the Forest Stewardship Program, registration is open to all landowners, including timber companies, governments, civic groups, schools, and other institutions.

Both natural area registry programs rely solely on voluntary agreements by landowners to preserve their tracts in a natural state. The main incentive is the recognition and honor conferred on the landowner for protection of significant elements of the state or regional natural heritage. Management advice may also be provided by the staff of the Natural Heritage Program or volunteers working for the Triangle Land Conservancy. Sites registered as state natural areas additionally receive some degree of statutory protection from pipelines and transmission lines. Although there are currently no tax benefits available from registration alone, the registry program has proven quite successful, and there are now several hundred natural areas now registered throughout the state.

CONTRACTUAL AGREEMENTS

The preceding conservation options depend on voluntary, and hence, changeable agreements on the part of the landowner. Another flexible but more permanent option -- one that can be transferred along with the property deed -- is the conservation easement. In this increasingly popular conservation option, the owner retains the title to the property, and hence still exercises certain property rights, including control of access to the public. Other rights, however, such as development, timbering, or mining, are deeded over to a recognized conservation organization, which by refusing to pursue these options thus preserves the tract in its natural state.

Provisions of the conservation easement are enforceable in civil court, and legally specify certain rights and responsibilities of both the landowner and the recipient of the easement. Each easement is tailored to suit the unique characteristics of individual properties and the varying needs and desires of the landowners.

Although more restrictive than the forms of protection mentioned above, there are several reasons why this option may be preferred. First, it represents a greater degree of partnership

¹⁷ For more information, write to: The NC Natural Heritage Program, Division of Parks and Recreation, PO Box 27687, Raleigh, NC 27611-7687.

¹⁸ For further information, write to: The Triangle Land Conservancy, PO Box 13031, Research Triangle Park, NC 27709.

between the landowner and a conservation group. Any costs involved in formulating and implementing management plans for the natural area can thus be shared, or even made the prime responsibility of the conservation organization. Second, as mentioned above, the easement can be permanently attached to the property deed, and passed along from one owner to another, from generation to generation. This may, in fact, be the greatest benefit to the altruistic owner who wishes to preserve a tract in its natural state in perpetuity. Third, there may also be tax benefits. The limits on development and other uses of the tract may bring about a corresponding reduction in estate and inheritance taxes, or in some areas, property taxes. If the easement is donated, it can also constitute a charitable contribution, allowing a deduction to be made on state or federal income taxes. Finally, although the easement lowers the overall assessed value of the property, the value of adjoining tracts not included in the easement may increase, since many potential buyers are attracted by the nearby presence of permanently undeveloped open space.

While conservation easements are the most popular form of legal protection for natural areas, there are other variations worth considering. Individual landowners, for instance, can agree to mutual covenants that place restrictions on the types of land uses allowed within a neighborhood. Several examples exist in Chatham County, including the Saralyn, Bynum Ridge, and Redbud developments. A landowner may also give a conservation easement to the state, which is the process involved in establishing a Dedicated State Nature Preserve. Part of the White Pines Promontory is protected by this means. Two types of legally-binding contracts used in conserving natural areas are management agreements and long-term leases granted to conservation organizations.

TRANSFER OF OWNERSHIP

Where an owner of a high quality natural area does not wish to maintain an active involvement in its management and is willing to part with the tract, transfer of ownership to a conservation organization or agency is the simplest way of assuring permanent protection. As with the conservation easement, there may be several state and federal tax benefits associated with fee simple transfer of property. The exact amount of these benefits varies depending on whether the transfer takes the form of a donation, bargain sale, or sale at fair market value. Again, deed restrictions can be added, allowing the original owner to contribute to the permanent management plans for the tract.

Two private conservation organizations that acquire natural areas either by donation or purchase are the Triangle Land Conservancy and the North Carolina Nature Conservancy¹⁹. The Nature Conservancy is particularly interested in sites that are significant at the state or national level, while the Triangle Land Conservancy is interested in sites of more local significance. Other potential recipients of land for conservation purposes include various governmental entities, including municipalities, counties, soil and water conservation

¹⁹ Suite 223, Carr Mill Mall, Carrboro, NC 27510.

districts, and several other state agencies. Where populations of state listed species of plants occur on a property, the Plant Conservation Program of the Department of Agriculture²⁰ may be interested in acquiring the tract. The NC Wildlife Resources Commission²¹ may similarly be interested in acquiring sites where endangered or special interest animal species occur.

LAND USE PLANNING AND REGULATION

If conservation of natural areas is to succeed, then governments, like landowners, must become active participants. As mentioned previously, natural areas cannot be protected in isolation. Water and air pollution do not recognize property boundaries, and changes in adjacent environments, such as development, road construction, dam building, and clear-cutting, can have significant impacts on otherwise well-protected sites. Accordingly, governmental planning and land-use regulation can play a major role in all protection efforts, whether for natural areas or property values.

At the municipal and county level, comprehensive land use plans are frequently used tools for conservation. Planning is primarily concerned with how the government itself selects areas for projects, such as reservoirs, water and sewer lines, landfills, waste water plants, and roads. In the more progressive comprehensive plans, landscape features such as open space, greenways, and natural areas are explicitly considered in land-use decisions. Orange County, for instance, has incorporated the findings of its natural areas inventory into the county's comprehensive plan. Planners make use of this information not only to avoid damage to sensitive environmental areas but also to enhance their value. Protecting links between natural areas by preserving conservation corridors along river and stream courses is, for instance, one of the most effective ways to ensure the long-term survival of wildlife in the Triangle region's increasingly urbanized landscape.

In addition to comprehensive land use plans, which are widely used throughout the state, another tool has recently been made available at the county level to assist the process of making land-use decisions. A county environmental impact ordinance, as just adopted by Orange County, can require that an environmental assessment be written for any project, public as well as private, that has significant potential for adversely affecting the environment. Of particular relevance here is the provision in the Orange County ordinance that requires an assessment for any project conducted on a site identified as a natural area in the Orange County inventory. Although the county ordinance cannot itself prohibit

²⁰ The Plant Conservation Program, NC Dept. of Agriculture, P.O. Box 27647, Raleigh, NC 27611; (919) 733-3610.

²¹ Nongame and Endangered Wildlife Program, NC Wildlife Resources Commission, 512 N. Salisbury Street, Raleigh, NC 27611.

environmental degradation, any adverse impacts identified in the assessment (or in a more detailed environmental impact statement) may require application for a special use permit.

This protection tool, while new at the county level, has long been in use at the state and federal levels, as authorized by the State and National Environmental Policy Acts (SEPA and NEPA, respectively). In fact, one of the primary uses of the information provided in county natural areas inventories occurs in the review by the Natural Heritage Program of state and federal environmental assessments. As is true at the county level, the finding of a significant potential for environmental damage by a project can result in the denial of state or federal permits or recommendations for a change in the nature of the project. Such regulatory authority is most frequently evoked where a project affects wetlands, results in degradation of air or water quality, or brings about the destruction of certain listed species of plants and animals.

Although governmental regulation of land use is often controversial, particularly with regard to zoning, there are situations where it is absolutely critical if conservation is to succeed. River and stream habitats, for instance, are nearly impossible to protect without limits placed on the types of land and water uses allowed within watersheds. As mentioned previously, the nationally significant aquatic habitats in the lower Rocky and Deep Rivers cannot be protected simply by preserving tracts along the reaches where the rare species occur (although that certainly helps); these habitats are imperilled primarily by land and water abuses occurring far upstream.

Measures needed for the protection of stream and river habitats include regulation of both point sources of pollution, such as sewage treatment plants (including the rapidly proliferating package plants), and non-point sources such as cultivated fields, clear-cuts, and construction activities involving extensive earth-moving. Many protection measures, such as prohibiting development in frequently inundated floodplains and preserving vegetated buffer strips along watercourses, are simply common sense. More expensive measures, such as modernizing wastewater plants and following best management practices for the control of runoff, also make good sense as investments in the clean water supplies that we all require. Still other measures, such as limitations on housing density and impervious surfaces, are more controversial but may also be needed if we truly want to preserve our most important aquatic habitats, such as found in the lower Rocky and Deep Rivers in Chatham County. In making such decisions, we are essentially giving more weight to the long-term interests of both our society and our environment than to shorter-term (and often shorter-sighted) gains of the marketplace.

ENDANGERED SPECIES PROTECTION

The state and federal Endangered Species Acts and the NC Plant Protection and Conservation Act provide protection for officially listed species (see Table II). The main form of protection is prohibition on "take", which refers not only to killing or collecting, but also

harassment and other forms of disturbance²². The nesting pair of bald eagles on Jordan Lake, for instance, is protected under this provision of the federal Endangered Species Act.

The federal Endangered Species Act also provides for the protection of critical habitat needed for the continued survival of listed species; this involves delineating actual areas on the map where such habitat is declared to occur. Designation of critical habitat prohibits federal agencies (or the use of federal funding) to conduct any project that would cause environmental degradation in the delineated areas.

Originally, Critical Habitat was to be designated for each listed species, but following the snail darter controversy of the mid-1970's, the Endangered Species Act was amended to allow listing without such designation. Although this was done partly to avoid repeating such major confrontations, it has also had some beneficial effects. Listing species can now proceed much more rapidly than before (at least in theory), and the Fish and Wildlife Service can be more selective in deciding for which species to designate critical habitat. Species that are vulnerable to exploitation by collectors, for example, would probably be more harmed by announcing their locations than they would benefit by being protected from federal projects²³.

While the failure to designate critical habitat would still seem to leave many species with little real protection, it should also be mentioned that under the current law critical habitat designation has few effective teeth. The designation of the Rocky River as critical habitat for the Cape Fear shiner, for example, has not provided any protection for water quality within this basin, since the critical habitat provision does not affect private, municipal or state projects that do not involve federal funds or permits. Nor does it guarantee that any federal funds will be spent to improve habitat quality.

While the state statutes provide no explicit provision for habitat protection, under a joint agreement between the Division of Environmental Management and the Wildlife Resources Commission, critical habitat can be designated at least for listed species of aquatic animals. Determination by the Wildlife Commission that specific reaches of streams and rivers are critical to the survival of listed species allows (but does not mandate) the Division to define these reaches as State High Quality Waters. This ruling places them in the WS II stream category even if these streams do not meet other water quality criteria. The WS II designation, in turn, requires that all wastewater plants discharging into the watershed meet

²² The state acts are more restricted in their definitions of take than is the federal Endangered Species Act. The Plant Protection and Conservation Act, for instance, exempts disturbances made in the course of agriculture, forestry, and development.

²³ It must be pointed out that the Critical Habitat Designation does not affect private property.

advanced treatment standards. It also requires that a program be implemented for the control of erosion and runoff into the basin.

Although potentially even more effective than the federal protection for critical habitat, state designation of critical aquatic habitats is still more theory than practice. Several streams have been nominated for critical habitat status, including the lower Rocky and Deep Rivers, but the Wildlife Commission has yet to make any such declarations, despite the rapid loss of many of the state's most endangered aquatic organisms.

CITIZEN INVOLVEMENT

This report is intended not only for the Triangle Land Conservancy, the Chatham County Planning Office, and the Natural Heritage Program, but also for the general citizens of Chatham County. Public support is critical for any conservation effort to succeed. As concrete examples, designation of critical habitat, enactment of watershed protection, upgrading wastewater plants, and creation of tax breaks for conservation management practices are all governmental decisions that must be backed by the citizens. Acquisition and management of natural areas by organizations such as the Triangle Land Conservancy are also completely dependent on the monetary contributions and volunteer labor provided by private citizens.

Less easy to pin down but equally important, conservation will succeed only where there is a general atmosphere that favors involvement by all citizens, whether or not they own significant natural areas or indeed any land at all. Landowners must be able to take pride in their stewardship of the land and should receive recognition for their accomplishments, which indeed serve the general interests of the entire community. Citizens must likewise feel pride and be actively involved in the preservation of the natural heritage of their local neighborhood, county, and region.

We hope this report stirs Chatham residents to take this sort of active interest in their natural surroundings. One of the best ways to start is to see the sites first hand. Several of the sites are, in fact, open to the public, including the Jordan Lake Natural Areas and the White Pines Natural Area. Other sites may become open at least to organized groups led by qualified leaders who have the explicit approval of the landowners. Indeed, the best way to become further acquainted with the county's natural areas is by joining one of the several local conservation and natural history groups serving the Chatham County region.

Active citizen involvement is important for one final reason: the inventory needs to be kept going as a living project. Many significant natural areas can yet be discovered in Chatham County and rare species can be found even in areas that have been fairly well documented (more sadly, some will also disappear). This document only marks the beginning of this process; the rest of the work is left for the county's citizens to complete.

The following is a list of local conservation and natural history organizations that serve the Chatham County area. Our final recommendation is that an Inventory Review Committee be drawn from these groups, as well as from the staff of the county planning office, additional governmental agencies, and any other interested citizens of the county. One main role of such a committee, as put into practice in Durham County, is to oversee the official adoption (or deletion) of sites from the inventory. This group can also serve to coordinate the conservation efforts of all interested parties in the county, and to communicate with similar committees in neighboring counties in order to extend conservation efforts throughout the region.

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North Carolina Nature Conservancy
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Haw River Assembly
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Deep River Park Association
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