CATAWBA RIVER BASIN
NATURAL RESOURCES PLAN

NORTH CAROLINA
DEPARTMENT OF ENVIRONMENT
AND NATURAL RESOURCES

NORTH CAROLINA
WILDLIFE RESOURCES COMMISSION

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INTRODUCTION

The Catawba River basin contains significant natural resources, but it is also the most densely populated river basin in the state, containing over a million residents and encompassing the city of Charlotte. This major population base creates tremendous needs for water supply and public recreation, but it also generates pressure for growth and development that can jeopardize water quality and encroach on natural areas, open space, and wildlife habitat. The character of the Catawba River is largely shaped by a series of seven hydropower reservoirs which were built and are operated by Duke Power under a license from the Federal Energy Regulatory Commission. The State of North Carolina, local municipalities, Duke Energy and non-governmental organizations share major responsibilities, challenges, and opportunities in planning for the future protection and management of the significant public resources in the Catawba River Basin.

The NC Department of Environment and Natural Resources and the NC Wildlife Resources Commission undertook a cooperative effort to prepare this Catawba River Basin Natural Resources Plan. Agencies providing input from the Department of Environment and Natural Resources were the Division of Water Resources, the Division of Water Quality, and the Division of Parks and Recreation, including the Natural Heritage Program, the State Trails Program and the Comprehensive Planning Program. Within the Wildlife Resources Commission, input was received from the Division of Inland Fisheries, Division of Wildlife Management, and the Nongame and Endangered Wildlife Section. These agencies also received input from Duke Power, local municipalities and non-governmental organizations that was incorporated into the plan.

The Natural Resources Plan is intended to serve multiple purposes. First, it assembles both written and unwritten agency plans and goals into a single document. The plan is strengthened by the fact it was prepared at a Departmental level, thus incorporating multiple agency views. Second, by considering the entire basin, this plan makes it possible to see the connections among watersheds, municipalities and jurisdictions. Third, it complements the Catawba River Basinwide Water Quality Management Plan and provides another avenue for raising water quality issues with other agencies and the public. Most importantly, this plan will provide the basis for planning to ensure that the essential natural resources of the Catawba River basin are protected and enhanced, and avoid costly restoration efforts.

Resource specialists from each agency or program provided a list of resources, usually a geographical unit, (Table 1) and assigned a priority of high, medium or low to each resource. The resource lists given by each specialist were based on existing data (e.g., Catawba River Basinwide Water Quality Management Plan), agency goals and objectives, and personal knowledge of the resources of the basin. Priorities were based on the significance of the resource (e.g., size or national importance), rarity of the resource (e.g., rare species), risk to the resource (e.g., from rapid human development), existing protection (e.g., already within public ownership), human use of the resource (e.g., recreation demand), and potential for resource improvement (e.g., restoration success). A draft of the plan was sent to numerous municipalities and non-governmental organizations for review.

The resource lists were converted into individual GIS layers. Each identified resource (location) in each layer was assigned a numerical value based on the agency's priority rating as follows: high = 3, medium = 2, low = 1, and no rating = 0. The layers were then combined into a summary map. The agency values were summed across layers to provide an overall score, which ranged from 0-19 (mean = 6, standard deviation = 3). Department-level priorities were then assigned based on a simple statistical analysis of the overall scores. Priority I resources were those that were ≥3 standard deviations from the mean score, Priority II resources were those 2 standard deviations from the mean and Priority III resources were ±1 standard deviation from the mean. Inconsistencies in the data were corrected and a final set of maps was produced for the individual watersheds. We thank Duke Power for assistance in preparing these maps.

Table 1. List of Resources Considered in Preparing the Catawba River Resources Plan.

Resource Type or Issue	Agency with Primary Input
Angler access	Wildlife Resources Commission, Division of Parks & Recreation
Boating access, canoe portages	Wildlife Resources Commission, Division of Parks & Recreation
Fish habitat	Wildlife Resources Commission
Hunting access	Wildlife Resources Commission
Impaired water quality (303(d) listed waters)	Division of Water Quality
Instream flows	Division of Water Resources, Wildlife Resources Commission
Outstanding resource waters, high quality waters	Division of Water Quality
Rare, threatened, endangered species	Wildlife Resources Commission, Division of Parks & Recreation
Significant natural heritage areas	Division of Parks & Recreation
State and county parks	Division of Parks & Recreation
Stream blockages (dams)	Division of Water Resources
Trails and greenways	Division of Parks & Recreation
Water supply watersheds	Division of Water Quality
Wildlife habitat	Wildlife Resources Commission

The reader is cautioned that the method used to determine priorities is conservative, in that only those resources that are significantly different from the mean score are considered of the highest priority. Although the bulk of the resources are Priority III, this doesn't mean they are unimportant. The fact that an agency assigned a priority value to a resource indicates a level of interest.

This document is designed to compile a list of important resources in the Catawba River basin. It is a reflection of our existing knowledge of the resources, agency and municipality objectives, and the demands and threats to the resources. Because these conditions are dynamic, this plan must be updated periodically to reflect changes due to plan implementation or other factors. Organizations are encouraged to provide the agencies with additional information or updates, as they become available.

Implementation of the action items in this document will require site-specific or objective-level plans. This often can best be accomplished through joint partnerships among any combination of stakeholders, which is strongly encouraged. However, the plan does not prevent individual agencies, counties, municipalities or organizations from pursuing actions to protect or enhance specific resources, regardless of the overall priority rating, if it is in their interest or field of expertise. Not all actions will necessarily be implemented or paid for by the Department or Wildlife Resources Commission. Every stakeholder in the basin has a role to play and an opportunity to improve the natural resources important to all.

This document does not prescribe the order that actions must be taken to address protection or enhancement of the resources. Acting on Priority I resources serves to fulfill the objectives of a number of different agencies in the Department and other organizations. Also, there is a distinction between priority rating and immediacy of action. Not all Priority I resources have to be completed before acting on the next level. It may be that a number of lower priority resources can be quickly, easily and cheaply protected or enhanced. This "low hanging fruit" should be harvested whenever the opportunity presents itself.

OVERALL PLAN RESULTS

Locations receiving the highest priority are generally riverine sections and upper ends of reservoirs that have large riparian areas and wetlands (Table 2). Action items for these areas are designed to protect their high-quality nature. Portions of the Catawba River below Lake James and Lake Hickory (Oxford Tailwater) also are in need of adequate instream flow releases from the dams to improve habitat for aquatic organisms.

Table 2. List of Priority I Locations in the Catawba River Basin.

Location	Watershed	Description found on page
Lake James	James	6
Lower Linville River	James	7
Catawba River	Rhodhiss	10
Lake Rhodhiss	Rhodhiss	11
Lower Johns River	Rhodhiss	11
Oxford Tailwater	Lookout Shoals	17
Upper Lake Norman	Norman	19
Jacob Fork	South Fork	27

Priority II areas consist mainly of the Catawba reservoirs and medium size rivers. Action items identified for the reservoirs include better habitat and water quality protection and, on the other hand, more and improved public access. The river sections include high quality habitats needing protection.

Table 3. List of Priority II Locations in the Catawba River Basin.

Location	Watershed	Description found on page
Upper Catawba River	James	7
Upper Linville River	James	7
Warrior Fork	Rhodhiss	12
Wilson Creek	Rhodhiss	12
Lake Lookout Shoals	Lookout Shoals	17
Lower Lake Norman	Norman	19
Mountain Island Lake	Mountain Island	21
Henry Fork	South Fork	28
South Mountains State Park	South Fork	28

Many of the proposed actions listed in the document emphasize riparian areas. We define the term "riparian corridor" to incorporate the concepts of forested buffers to protect water quality, flood-prone areas to absorb high flow events, corridors for wildlife movement, conservation zones for rare species and high quality natural communities, and riparian habitat important for multiple wildlife and aquatic organisms. However, not all riparian corridors include the concept

of a greenway, which is considered to include some form of direct human use, such as a trail. As used in this document, riparian corridors should be present on both sides of a stream and generally prohibit human development. Avoiding development in riparian corridors does not necessarily imply the use of mandatory regulations or ordinances. Riparian corridors can be created or expanded through voluntary means.

LAKE JAMES WATERSHED

DESCRIPTION

The Lake James subbasin (Figure 1) is 380 square miles in area. It includes the headwaters of the Catawba River and several major tributaries, including Curtis Creek, Buck Creek, Crooked Creek, the North Fork Catawba River and the Linville River. The Catawba River flows generally eastward with the largest tributaries flowing south. These northern tributaries are typically swiftly flowing, coldwater streams capable of supporting trout. Most of the streams in the watershed have good to excellent water quality. About half of the watershed is within the Pisgah National Forest. The largest urban area is the City of Marion.

PRIORITY I RESOURCES

Lake James (J-1)

Lake James is 6,510 acres and is fed by three major tributaries – Catawba River, North Fork Catawba River and Linville River. The lake is not currently used as a drinking water supply, but this is being considered by McDowell County. The waters of Lake James are used to generate electricity and for recreational purposes. The lake also has high scenic and recreational values, and Lake James State Park is located along the southern shoreline of the lake. Lake James provides important fishing and boating opportunities as well as habitat for the bald eagle. Approximately 14% of the 137 miles of shoreline are currently developed. Increasing development pressures, particularly along the lake shoreline, pose a threat to fish and wildlife habitats of Lake James.

Proposed Actions

- Protect a riparian corridor along the entire shoreline of Lake James to maintain water quality, aesthetics, and provide fish and wildlife habitat.
- Add land to the existing state park to provide additional habitat protection and recreational opportunities.
- Complete the development of public recreational facilities at Lake James State Park.
- Add land to the National Forest to protect additional habitat and provide water quality protection, especially on the north side of the lake.
- Increase land-based recreational opportunities around the lake.
- Relocate and expand the Linville boat access area.
- Provide additional public bank fishing sites at boat access areas and parks.
- Construct public restrooms at access sites on the reservoir.

Lower Linville River (J-2)

The Linville River flows from near Grandfather Mountain in Avery County, through the Linville Gorge Wilderness Area of the Pisgah National Forest and into Lake James. From NC 183 above the gorge to the boundary between US Forest Service lands and Duke Energy lands approximately 13 miles downstream, the river is designated as a Natural River component of the North Carolina Natural and Scenic Rivers System. The lower part of the river is designated as High Quality Water by the NC Division of Water Quality. The river currently supports a smallmouth bass and brown trout fishery and provides spawning habitat for walleye and white bass each spring. In addition, the river supports populations of several species of rare invertebrates.

Proposed Action

- Protect land from development along the lower Linville River between the Linville Gorge Wilderness Area and Lake James. A continuous corridor of protected land along this segment of the river would protect the river's water quality and would be of significant value as a wildlife corridor and as an opportunity for recreational trail connections.

PRIORITY II RESOURCES

Upper Catawba River (J-3)

Above Lake James, the Catawba River flows eastward from above Old Fort, past the City of Marion and into the lake. Water quality in this segment of the river is generally fair to good. The riparian and bottomland corridor along the river provides important wildlife habitat, and rare invertebrates live in the river. The river provides important spawning habitat for walleye and white bass. Attempts by the Wildlife Resources Commission to establish a smallmouth bass fishery have been unsuccessful. McDowell County is interested in establishing a greenway along this stretch of the river, and river access sites are needed as part of the proposed Catawba River Canoe Trail.

Proposed Actions

- Protect a riparian corridor along the upper Catawba River to protect water quality, aesthetics, and fish and wildlife habitat.

- Establish a greenway trail with appropriate river access sites along the river for float fishing, canoeing and other recreational uses.

- Sample sediment, invertebrates, and water quality to identify potential problems, and establish a brown trout fishery if feasible.

Upper Linville River (J-4)

The upper portion of the Linville River is ranked lower in priority for protection action than the lower portion because some degree of protection already exists for the upper Linville. Large

stretches of the river flow through the Pisgah National Forest. Water quality is generally fair to good. An undisturbed riparian corridor would protect water quality in the upper portion of the river that is not within public lands.

Proposed Action

- Establish and protect a riparian corridor along the upper reaches of the Linville River to protect water quality, aesthetics, and fish and wildlife habitat.

PRIORITY III RESOURCES

Buck Creek / Little Buck Creek (J-5)

Buck Creek flows along NC 80 from National Forest land into Lake Tahoma. Little Buck Creek is the other major inflow to Lake Tahoma. Below the lake, Buck Creek flows into the Catawba River northwest of Marion. Both Buck Creek and Little Buck Creek have water quality rated as Excellent, and both harbor populations of rare invertebrates.

Proposed Action

- Protect a riparian corridor along both Buck Creek and Little Buck Creek to protect water quality, rare invertebrates, and fish and wildlife habitat.

Curtis Creek (J-6)

Curtis Creek joins the Catawba River near where the river crosses I-40. The creek flows south and southeast from National Forest lands and harbors multiple species of rare invertebrates. Water quality in the creek is good.

Proposed Action

- Protect a riparian corridor along Curtis Creek to protect water quality, rare invertebrates, and fish and wildlife habitat.

Mackey Creek (J-7)

Mackey Creek is a tributary of the Upper Catawba River. The upper portion of the creek has excellent water quality and is designated as High Quality Water. The lower portion of the creek has severe water quality problems associated with discharges and non-point source runoff.

Proposed Actions

- Protect a riparian corridor along lower portions of Mackey Creek to protect water quality and fish and wildlife habitat.

- DWQ is working with the main discharger while process improvements are made to assure permit limits are met. This facility has plans to remove this discharge entirely in

the future. DWQ will develop a management strategy to restore water quality to the creek.

Mill Creek (J-8)

This tributary of the upper Catawba River is one of the areas of highest water quality in the basin. It is designated as High Quality Water.

Proposed Action

- Protect a riparian corridor along Mill Creek to protect water quality and fish and wildlife habitat.

North Fork Catawba River (J-9)

The North Fork Catawba River flows southward along US 221 and into Lake James. Water quality in the river is good to excellent, and sections of the river are designated as Public Mountain Trout Waters and are stocked by the Wildlife Resources Commission. The river supports smallmouth bass and rare invertebrates. Wetlands and bottomlands along the river provide wildlife habitat. Stillhouse Branch is a tributary of North Fork Catawba River, which flows westward off Linville Mountain. This stream also harbors rare invertebrates.

Proposed Actions

- Protect a riparian corridor along the North Fork Catawba River to protect water quality, rare invertebrates, and fish and wildlife habitat.

- Provide new float fishing access sites on the North Fork Catawba River.

- Protect a riparian corridor along Stillhouse Branch to protect rare invertebrates.

Paddy Creek (J-10)

Paddy Creek flows southeast from National Forest lands into the Linville section of Lake James. Water quality in the creek is fair to good and it contains rare invertebrates.

Proposed Actions

- Protect a riparian corridor along Paddy Creek to protect water quality, rare invertebrates, and fish and wildlife habitat.

- Add land to Lake James State Park along lower Paddy Creek and along the shoreline of Lake James.

LAKE RHODHISS WATERSHED

DESCRIPTION

The Lake Rhodhiss subbasin (Figure 2) is 710 square miles in area and includes all lands that drain into the Catawba River between the Bridgewater Powerhouse (Lake James) and Rhodhiss Dam downstream. Major tributaries include Muddy Creek, Silver Creek, Warrior Fork, Johns River, and Lower Creek. The watershed contains the cities of Morganton, Lenoir, Drexel, and Granite Falls. Lake Rhodhiss is a dominant feature on the mainstem of the Catawba in the lower section of the watershed.

Much of the northwestern portion of the watershed is within the Pisgah National Forest and many of the headwater tributaries are native trout waters and designated as High Quality Waters. The 23 miles of Wilson Creek, from its headwaters on Grandfather Mountain to its confluence with the Johns River, was recently designated as a National Wild and Scenic River. The Johns River watershed contains some high quality areas, but also has widespread agricultural land use along the river valley.

Muddy Creek in the southwestern watershed is severely impacted by erosion and sedimentation due to past land use practices. The sediment load from this watershed impacts Muddy Creek and the Catawba River from just downstream of Lake James to Lake Rhodhiss, including the Morganton water supply intake. Urban development and runoff from Lenoir and Morganton have impacted several tributaries in the southeastern portion of the watershed including Lower and Silver Creeks.

PRIORITY I RESOURCE AREAS

Catawba River (R-1)

The Catawba River from Lake James to the backwaters of Lake Rhodhiss is an 18-mile section of free-flowing river. This section of river is subject to daily flow fluctuations due to the peak power generation mode of operation of the Bridgewater Powerhouse at Lake James. The relatively undisturbed riparian corridor along this reach provides benefits to water quality, aquatic habitat, wildlife habitat, and aesthetics, but is threatened by future development.

Proposed Actions

- Conduct an instream flow study to determine an appropriate flow regime to protect, maintain, and enhance aquatic habitat, recreation, water quality and water supply. This study should also evaluate temperature and dissolved oxygen of the releases from Bridgewater.

- Protect a riparian corridor along the Catawba River to protect water quality, aesthetics, and fish and wildlife habitat.

- Acquire and develop a greenway trail along the Catawba River between Morganton and Lake James.

- Provide river access improvements between Lake James and Morganton to facilitate a water trail, float fishing, and canoe camping.

- Improve the safety and predictability of releases from Lake James for recreational users. Provide information on the release schedule to the public.

- Develop a high quality tailwater fishery.

- Evaluate modifications to the Morganton water intake dam to improve boater and angler safety, water supply intake capabilities, sediment transport and fish passage.

- Develop a sedimentation control strategy for the Catawba River and its tributaries between Lake James and Lake Rhodhiss.

Lake Rhodhiss (R-2)

Lake Rhodhiss is a mesotrophic reservoir with a surface area of 3,515 acres and 98 miles of shoreline. The entire reservoir is classified as a water supply with some areas carrying additional protection classifications for swimming and water supply intakes. The reservoir essentially functions as a run-of river reservoir and its water quality directly impacts the water quality of Lake Hickory, the next reservoir downstream. The reservoir is owned by Duke Power and used for hydroelectric power generation, recreation, and water supply. Currently, only about 3% of the shoreline is developed.

Proposed Actions

- The Western Piedmont Council of Governments will collaborate with DWQ and others to develop a Lake Rhodhiss Watershed Modeling Study to estimate sediment and nutrient loading and current and future watershed conditions. Based on on study results, a management strategy to control nutrient and sediment inputs to the lake will be developed.

- Protect a riparian corridor along the entire shoreline of Lake Rhodhiss to maintain water quality, aesthetics, and provide fish and wildlife habitat.

- Provide additional public bank fishing sites at boat access areas and parks.

- Construct public restrooms at access sites on the reservoir.

- Provide walking and bike trails along the shoreline of Lake Rhodhiss.

- Develop a canoe portage at the dam.

Lower Johns River (R-3)

The lower section of Johns River begins in Caldwell County near Collettsville where it is joined by Mulberry Creek and extends downstream to the Catawba River near the backwaters of Lake Rhodhiss. Wilson Creek is a major tributary to the lower Johns River. This reach of Johns River

is classified as High Quality Water and as a water supply watershed downstream of its confluence with Wilson Creek. It also supports the brook floater, a State-threatened freshwater mussel.

Proposed Actions

- Protect a riparian corridor along the Johns River to maintain water quality, aesthetics, provide fish and wildlife habitat, and protect the brook floater and other rare invertebrates.

- Restore riparian areas, wetlands and floodplains to natural condition where possible in existing agricultural and horticultural areas.

- Develop a sedimentation control strategy for the Johns River and its tributaries.

- Develop a greenway trail along the lower Johns River. This could connect with greenways along the Catawba River and Lake Rhodhiss.

- Provide new access sites for canoes.

PRIORITY II RESOURCE AREAS

Warrior Fork (R-4)

Upper Creek, Steels Creek and Gingercake Creek are tributaries to Warrior Fork, which joins the Catawba River at Morganton. These streams are classified as High Quality Water and provide habitat for a number of rare invertebrates.

Proposed Actions

- Protect riparian corridors along Warrior Fork, Upper Creek, Steels Creek and Gingercake Creek to maintain water quality, aesthetics, provide fish and wildlife habitat, and protect rare invertebrates.

Wilson Creek (R-5)

Wilson Creek is designated as an Outstanding Resource Water and a National Wild and Scenic River. Much of the watershed is located on U.S. Forest Service land and supports good populations of trout. This watershed contains habitats for rare plants and animals and scenic areas.

Proposed Action

- Protect a riparian corridor along Wilson Creek to maintain water quality, aesthetics, provide fish and wildlife habitat, and protect rare plants and animals.

- Develop a greenway trail along Wilson Creek. This could connect with greenways along

the Johns River and Catawba River.

PRIORITY III RESOURCE AREAS

Lower Creek (R-6)

Water quality in the Lower Creek watershed, including Bristol Creek, is impaired (partially supporting). Bristol Creek has a large associated wetland that is important for wildlife and nongame management.

Proposed Action

- Acquire this wetland area through easement or purchase to protect wildlife and nongame habitat and to improve water quality.

- Many actions will need to be implemented in this watershed to improve water quality. DWQ will work with other local interests to help develop a management strategy for this watershed.

Muddy Creek (R-7)

Muddy Creek's confluence with the Catawba River is less than one mile downstream of Lake James. Erosion problems in its 98 square mile watershed have resulted in sediment related problems in Muddy Creek, its tributaries, the Catawba River and Lake Rhodhiss.

Proposed Action

- Continue implementation of the Muddy Creek Watershed Restoration Project to reduce significant erosion problems and improve aquatic habitat and water quality within the watershed and downstream.

Old Catawba River Channel (R-8)

The 3.3 miles of the old Catawba River channel from the Catawba River dam (Lake James) downstream to its confluence with Muddy Creek has little flow, because this river reach is bypassed by the hydroelectric project at Lake James. The lack of flow results in limited aquatic habitat.

Proposed Action

- Conduct an instream flow study to determine an appropriate flow regime to enhance and protect aquatic habitat, recreation, and water quality.

Silver and Clear Creeks (R-9)

The upper reaches of Clear Creek are designated as High Quality Water. Silver Creek has a water supply classification and flows northeast to join the Catawba at Morganton.

Proposed Action

- Protect riparian corridors along Silver and Clear creeks to maintain water quality and provide fish and wildlife habitat.

- Develop sedimentation control strategies for these streams.

Upper Johns River (R-10)

The upper portion of Johns River extends from the headwaters downstream to Mulberry Creek. It supports the brook floater, a State-threatened freshwater mussel. Anthony Creek is a major tributary of the river in this upper section and supports rare invertebrates. Mulberry Creek is classified as High Quality Water. A significant portion of the Johns River watershed is within the Pisgah National Forest.

Proposed Actions

- Protect a riparian corridor along the Johns River and tributaries to maintain water quality, aesthetics, provide fish and wildlife habitat, and protect the brook floater and other rare invertebrates.

- Restore riparian areas, wetlands and floodplains to their natural hydrologic and vegetated condition.

- Develop a sedimentation control strategy for the Johns River and its tributaries.

Wilson Creek Slopes Significant Natural Heritage Area (R-11)

This natural area borders both sides of Wilson Creek and contains a variety of natural communities, all of good to excellent quality. Communities include montane alluvial forest, acidic cove forest, and dry oak hickory forest. Part of the site is protected by conservation easement, but the extent of ecological significance beyond the boundaries of the easement are not well known.

Proposed Actions

- Conduct biological inventories on nearby lands both upstream and downstream to better define the area of ecological significance.

LAKE HICKORY WATERSHED

DESCRIPTION

The Lake Hickory subbasin is approximately 220 square miles in area (Figure 3). About half of the drainage area is forested and another one-third is agricultural. Hickory is the only major city in this portion of the watershed. Lake Hickory is a 4,100 acre run-of-river impoundment located between Lake Rhodhiss and Lookout Shoals Reservoir on the Catawba River. The lake, owned by Duke Power, was filled in 1928 and is used for hydropower generation, recreation and water supply purposes. The major tributaries into Lake Hickory are Middle Little River and Gunpowder Creek, both of which transport large amounts of sediment.

PRIORITY III RESOURCES

Gunpowder Creek (H-1)

Gunpowder dams #1 and #2 are located on Gunpowder Creek, neither of which are used for hydropower generation any longer. Benefits of dam removal include restoring stream habitat, sediment and nutrient transport, and animal movements. Negative impacts may include release of sediment and associated contaminant substances, and loss of wetland and bottomland habitats.

Proposed Action

- Examine the positive and negative impacts of removing the dams.

Lake Hickory (H-2)

The entire lake is classified as a water supply. Currently, water quality is generally good, but sedimentation from tributaries in the watershed and increasing development threaten water quality. About 51% of the 106 miles of shoreline is developed, mainly by single-residence homes. Natural habitat is becoming scarce and the need for additional recreation sites is increasing as development increases.

Proposed Actions

- Protect a riparian corridor along the entire shoreline of Lake Hickory to protect water quality, aesthetics, and provide fish and wildlife habitat.
- Create a canoe portage around Lake Hickory dam.
- Enhance local recreational opportunities by developing facilities at Dusty Ridge County Park (Alexander County) along the shoreline of Lake Hickory.
- Construct public restrooms at access sites on the reservoir.
- Provide additional public bank fishing sites at boat access areas and parks.

Middle Little River (H-3)

Rink Dam is located on Middle Little River, but is no longer used for hydropower generation. However, as the impoundment has become filled with sediment, it now provides good wetland and bottomland habitats.

Proposed Action

- Protect wetlands and bottomland habitats from development.

LOOKOUT SHOALS RESERVOIR WATERSHED

DESCRIPTION

The Lookout Shoals subbasin is about 140 square miles in size (Figure 4). Approximately half of the drainage area is forested and another one-third is agricultural. The city of Taylorsville is the only large municipality in this watershed.

Lookout Shoals Reservoir, at 1,270 acres, is the smallest lake on the Catawba chain in North Carolina. Lake Hickory, just upstream, influences the water quality of Lookout Shoals more than does the surrounding watershed. The lake is owned by Duke Power and is used for hydropower generation, recreation and water supply purposes. It was completed in 1916, making it the first dam built on the Catawba River in North Carolina.

The major tributaries of Lookout Shoals Reservoir are the Catawba River and Lower Little River. Highly erodible soils and moderate gradients contribute to large amounts of sediment in the Lower Little River.

PRIORITY I RESOURCES

Oxford Tailwater (L-1)

The upper 2-mile portion of Lookout Shoals Reservoir is a riverine portion of the Catawba River. Water quality is generally good and the shoreline is relatively undeveloped. Riverbend Park (Catawba County) is located in the tailwater and contains four improved bank fishing areas.

Proposed Actions

- Conduct instream flow analysis to determine appropriate flows to protect aquatic habitat, recreation and water quality.
- Protect a riparian corridor along the Oxford tailwater to maintain aesthetics and fish and wildlife habitat.
- Develop a canoe access area at the lower end of the tailwater.

PRIORITY II RESOURCES

Lookout Shoals Reservoir (L-2)

The lake is a designated water supply watershed for Statesville, although it is not being utilized as such at this time. Water quality is currently good, but sedimentation from tributaries in the watershed and increasing development threaten water quality. There are 33 miles of shoreline, of which 27% is developed, mainly by single-residence homes. As development increases around the lake, natural habitat will become scarce and the need for additional recreation sites will increase.

Proposed Actions

- Protect a riparian corridor along the entire shoreline of Lookout Shoals Reservoir to protect water quality, aesthetics, and fish and wildlife habitat.
- Create a canoe portage around Lookout Shoals dam.
- Construct public restrooms at access sites on the reservoir.
- Provide additional public bank fishing sites at boat access areas and parks.

LAKE NORMAN WATERSHED

DESCRIPTION

The Lake Norman subbasin (Figure 5) is about 340 square miles in area and includes North Carolina's largest reservoir. Located between Lookout Shoals Reservoir and Mountain Island Lake, Lake Norman is over 32,500 acres and extends about 34 miles from the Cowans Ford Dam to the tailrace of Lookout Shoals Lake. Duke Power completed construction of the dam and the hydroelectric station in 1963. In addition to providing hydroelectric power from Cowans Ford Hydroelectric Station, Lake Norman provides cooling water for Marshall Steam Station and McGuire Nuclear Station. The entire lake is classified as a water supply. Lyle Creek and Buffalo Shoals Creek are the major tributaries of Lake Norman. There are 569 miles of shoreline on Lower Lake Norman. With 61% of the shoreline developed, it is the most developed reservoir in the Catawba chain.

PRIORITY I RESOURCES

Upper Lake Norman (N-1)

The natural resource character of Upper Lake Norman is much different from the rest of the reservoir. This area of the lake has little development and retains some riverine characteristics, especially those areas closer to Lookout Shoals dam. In addition, there are significant wetland and waterfowl habitat scattered throughout the Upper Lake Norman corridor.

Proposed Actions

- Protect a riparian corridor along the entire shoreline of Lake Norman to maintain water quality, aesthetics, and fish and wildlife habitat.

- Protect Catawba Game Land and wetland habitats in the upper portion of the lake through easements, purchase or buffers.

PRIORITY II RESOURCES

Lower Lake Norman (N-2)

Population growth in Catawba, Lincoln, Mecklenburg, and Iredell Counties has created tremendous recreational demand on Lower Lake Norman. While there are substantial recreational facilities in this area of Lake Norman, proposed actions are related to enhancement of this significant resource. Because of the highly developed nature of this area, protecting or enhancing of existing fish and wildlife habitats is important for natural resource management.

Proposed Actions

- Expand existing facilities at Lake Norman State Park.

- Create a Mecklenburg County park at Ramsey Creek Access Area by acquiring a land donation or extension of lease from Duke Power.
- Support local efforts to develop a new park at Beattys Ford Access Area.
- Create a new park in Mecklenburg County with access to Lake Norman.
- Protect islands located on the southern end of the lake from development.
- Provide additional public bank fishing sites at boat access areas and parks.
- Construct public restrooms at access sites on the reservoir.
- Develop a canoe portage around Cowans Ford Dam.
- Provide additional public hunting areas in the Lake Norman area.
- Protect a riparian corridor along the entire shoreline of Lake Norman to protect water quality, aesthetics, and re-establish fish and wildlife habitat.

MOUNTAIN ISLAND LAKE WATERSHED

DESCRIPTION

Mountain Island Lake is owned by Duke Power and is immediately downstream of Lake Norman (Figure 6). It is the smallest subbasin of the Catawba at 70 square miles. The lake was filled when construction on the Mountain Island Hydroelectric Station was completed in 1924. Mountain Island is a relatively small and narrow lake. Duke Power uses the lake to generate electricity at both the Riverbend Steam Station and the Mountain Island Hydroelectric Station located at the dam. The waters of Mountain Island Lake are also used as a water supply by several municipalities. Water quality sampling conducted by the Division of Water Quality indicated that Mountain Island Lake was mesotrophic during the 1980s and oligotrophic since 1992.

PRIORITY II RESOURCES

Mountain Island Lake (M-1)

Like Lake Norman, Mountain Island Lake is adjacent to major population centers and receives considerable public use. The lake is about 2,800 acres in area and has 80 miles of shoreline, of which 23% is developed. While there are significant recreational facilities on Mountain Island Lake, including two public accesses, one county park, and a waterfowl refuge, proposed actions are related to enhancement of these existing resources. The NC Forest Service, with cooperating agencies from Gaston and Lincoln counties, has adopted plans to establish an Educational State Forest on property owned by Gaston County at the lake. Since Mountain Island is a drinking water source, a significant portion of the Mountain Island shoreline has been protected through land acquisition initiatives.

Proposed Actions

- Provide additional public bank fishing sites at boat access areas and parks.
- Protect a riparian corridor along the entire shoreline of Mountain Island Lake to protect water quality, aesthetics, and fish and wildlife habitat.
- Continue local efforts to protect water quality in Mountain Island Lake.
- Construct public restrooms at access sites on the reservoir.
- Provide additional public hunting areas in the Mountain Island Lake area.
- Establish the Educational State Forest.
- Create a new park in Mecklenburg County with access to Mountain Island Lake.

PRIORITY III RESOURCES

Beatties Ford Significant Natural Heritage Area (M-2)

This state-significant natural area contains one of the largest and best-quality basic oak-hickory forest stands in North Carolina.

Proposed Actions

- Protect the Beatties Ford Road Basic Forest Significant Natural Heritage Area from development.

McDowell Creek (M-3)

McDowell Creek is a major tributary to Mountain Island Lake and is a major source of nutrient enrichment because of a Charlotte-Mecklenburg Utilities sewage treatment plant. Charlotte-Mecklenburg Utilities has added additional monitoring sites downstream of the discharge to assess reductions in nutrient loading to the creek. Preliminary data show a significant reduction of nutrients as a result of a recent upgrade. In addition, the McDowell Creek watershed is developing rapidly and receives considerable storm-water runoff. McDowell Creek may be suitable for local actions under the Mecklenburg County Surface Water Improvement and Management (SWIM) to address the nonpoint source contributions to degradation. The entire length of McDowell Creek is on the state's 303(d) list (not yet EPA approved) in this subbasin. A management strategy is being developed in conjunction with local stakeholders.

Proposed Actions

- Continue monitoring water quality and developing the management strategy.

Gar Creek (M-4)

Gar Creek flows southwestward into Mountain Island Lake at Gar Cove, the location of Mecklenburg County's major drinking water intake. The watershed is primarily rural, but is vulnerable to development pressures from the Charlotte area. Water quality is rated Good by the Division of Water Quality, and land along the creek corridor includes significant natural and cultural resources, as well as opportunities for recreation. The Catawba Land Conservancy is working with partner agencies to acquire and protect tracts within the watershed.

Proposed Actions

- Protect a riparian corridor and other lands within the Gar Creek watershed.

LAKE WYLIE WATERSHED

DESCRIPTION

The Lake Wylie subbasin (Figure 7) includes the Catawba River and several major tributaries including South Fork Catawba River, Long Creek, Crowders Creek and Catawba Creek. Excluding the South Fork Catawba River watershed, it is about 369 square miles in area. Crowders Creek flows into the lake within South Carolina. Both Catawba Creek and Crowders Creek are considered to be impaired and in need of restoration efforts. Other streams draining to Lake Wylie have notable problems that also need focused attention. Water quality problems related to nutrient enrichment have been noted in Lake Wylie.

The watershed is relatively undeveloped in its upstream sections, but becomes more urban further downstream. Bessemer City, Kings Mountain and South Gastonia are within the watershed, as well as a large portion of Mecklenburg County. There are several large dischargers within the Crowders Creek and Catawba Creek watersheds. Phytoplankton surveys on the Crowders Creek arm of Lake Wylie have indicated elevated levels of nutrients and chlorophyll *a* and algal bloom conditions. The Division of Water Quality is implementing a nutrient management strategy for discharges in the Lake Wylie watershed.

PRIORITY III RESOURCES

Catawba Creek (W-1)

Approximately 7.4 miles of Catawba Creek are impaired (not supporting) due to both point and nonpoint sources of pollution. The Gastonia Catawba Creek wastewater treatment plant has impacted the creek, along with urban runoff. The Catawba Creek arm of Lake Wylie is not impaired; however, the Division of Water Quality is concerned about the eutrophication of this arm of the lake. The Gastonia Catawba Creek wastewater treatment plant was recently decommissioned. All waste is being sent to a City of Gastonia state-of-the-art facility on Long Creek. The removal of this discharge and the operation of a new facility are expected to improve water quality on Catawba and Long Creeks. The Catawba Creek arm should also reflect this improvement.

Proposed Actions

- Additional data and information is needed to assess the impacts of both point and nonpoint sources of pollution.

- Protect a riparian corridor along Catawba Creek to protect water quality and fish and wildlife habitat.

Crowders Creek (W-2)

The entire NC portion of Crowders Creek (15.8 mi.) is impaired (partially supporting) due to both point and nonpoint sources of pollution. Point sources include the Gastonia wastewater

treatment plant (with several discharges to this facility) and nonpoint sources include urban runoff.

The Gastonia Crowders Creek wastewater treatment plant has undergone an upgrade and acts as one of three City of Gastonia regional waste treatment facilities. This facility currently removes phosphorus and is being modified to remove total nitrogen in 2001. The significant improvements made by this and other dischargers in the watershed are expected to result in measurable improvements in water quality in Crowders Creek. The Crowders Creek arm of Lake Wylie should also show improvements.

Proposed Actions

- An in-depth watershed assessment is needed to determine the impacts from both point and nonpoint sources of pollution. The Division of Water Quality will conduct monitoring to assess the cumulative impacts of the Gastonia area above the wastewater treatment plant and improvements to water quality as a result of process improvements at the Crowders Creek wastewater treatment plant. Additional watershed information will also be necessary.

Crowders Mountain State Park (W-3)

Crowders Mountain State Park is 3,000 acres in size and encompasses Crowders Mountain and Kings Pinnacle, twin erosion ridges that rise nearly 800 feet above the surrounding piedmont hills. The ridges have sheer vertical cliffs and high quality natural communities. The park provides opportunities for the public to enjoy scenic beauty and outdoor recreation activities.

Proposed Action

- Pursue acquisition and development of the Crowders Mountain State Park in Gaston County to protect multiple rare species. Further acquisition of 3,080 acres is recommended. Development should include picnic area and campground expansion, Pinnacle Turnback Trail renovation and Rock Top Trail renovation.

Killian (W-4) and Leepers Creeks (W-5)

These streams are in the upper portion of the watershed and support bottomland habitats and rare invertebrates.

Proposed Actions

- Protect a riparian corridor along Killian and Leepers creeks to protect rare invertebrates and important bottomland habitats.

Lake Wylie (W-6)

Lake Wylie was constructed in 1924 and now owned by Duke Power and used to generate electricity and for recreational purposes. The lake is about 12,200 acres in area, with the upper portion of the lake (5,486 acres) in North Carolina and the majority of the lower portion in South

Carolina. The entire lake in North Carolina is designated as a water supply. Lake Wylie contains about 130 miles of shoreline in North Carolina. Lakewide, 48% of the shoreline is currently developed. Reservoir shoreline habitat, particularly large woody debris, is disappearing as the lake becomes developed.

Proposed Actions

- Watersheds within the Lake Wylie drainage, especially the impaired waters, need additional monitoring and implementation of management strategies to restore designated uses to those waters draining to the lake. A nutrient management strategy for point source dischargers continues to be implemented by the Division of Water Quality and significant reductions of nutrient loadings have been accomplished. Additional management strategies are needed to address the nonpoint source inputs of pollution.

- Expand and further develop Catawba Riverfront Park.

- Develop Upper Steele District Park and Walker Branch District Park at Lake Wylie in Mecklenburg County.

- Acquire and develop a new park in Mecklenburg County with access to Lake Wylie.

- Provide additional public bank fishing sites at boat access areas and parks.

- Construct public restrooms at access sites on the reservoir.

- Provide additional public hunting areas in the Lake Wylie area.

- Protect a riparian corridor along the entire shoreline of Lake Wylie to protect water quality, aesthetics, and fish and wildlife habitat.

Long Creek (W-7)

Approximately 15.3 miles of Long Creek in Mecklenburg County are rated impaired (partially supporting) due to turbidity and manganese. Impairment is likely due to urban runoff, construction and agriculture in the watershed. This evaluation is based on Division of Water Quality ambient chemical monitoring data.

Proposed Actions

- An in-depth watershed assessment is needed, including further monitoring, to better determine sources of impairment. Long Creek is on the state's 303(d) list (not yet EPA approved) for developing a management strategy.

Stanley Creek (W-8)

Stanley Creek flows southeastward and joins Dutchman's Creek north of the town of Mount Holly. Water quality in Stanley Creek is not monitored by the Division of Water Quality, but the

rating for Dutchman's Creek is Excellent. The watershed includes working farms as well as hardwood forests, steep slopes, wetlands, and rare species.

Proposed Actions

- Protect a riparian corridor and other lands within the Stanley Creek watershed.

SOUTH FORK CATAWBA RIVER WATERSHED

DESCRIPTION

The South Fork Catawba River subbasin is about 650 square miles in area (Figure 8). The headwaters of the South Fork Catawba River are formed by the confluence of Henry Fork and Jacob Fork. The other major tributaries include Clark Creek, Indian Creek and Howards Creek. Clark Creek originates in Hickory and flows southward into the South Fork Catawba River in Lincolnton. Howards Creek and Indian Creek begin at the Catawba/Lincoln County line southwest of Hickory and flow southeastward to the South Fork Catawba River at Lincolnton and Laboratory, respectively. The Long Creek watershed flows eastward into the portion of the South Fork Catawba River between Stanley and Lake Wylie. The South Fork Catawba River watershed provides drinking water to numerous jurisdictions.

This watershed contains a portion of 11,000 acres of protected area known as the South Mountains State Park. Land use in this subbasin is primarily agriculture with some urban areas. Most of the streams in this watershed are very sandy due to erosion problems throughout the area. There are many dischargers in this highly industrialized area and most are located near the South Fork Catawba River. The largest dischargers include the municipalities of Hickory, Lincolnton, Newton, and the Gastonia Long Creek wastewater treatment plant. In addition, this watershed has a high number of textile dischargers that release colored effluent to the South Fork and its tributaries.

Several waters within this watershed are considered to be impaired and in need of restoration efforts; others have notable problems that also need focused attention. Streams with the worst water quality include Clark Creek, which receives effluent from domestic, industrial and textile sources; and Mauney Creek, which receives effluent from the Stanley wastewater treatment plant. Several issues related to potential derelict dam removal and instream flow should be considered for implementation of this resource plan.

PRIORITY I RESOURCES

Jacob Fork (S-1)

Jacob Fork drains sections of South Mountains State Park. It supports very good trout populations and rare invertebrates. The upper reach of Jacob Fork has excellent water quality and has been designated Outstanding Resource Waters by the Division of Water Quality.

Proposed Actions

- Protect a riparian corridor along Jacob Fork to protect water quality, aesthetics, rare invertebrates, and fish and wildlife habitat.

- Evaluate the potential for trail development on Jacob Fork in Catawba County.

PRIORITY II RESOURCES

Henry Fork (S-2)

Henry Fork drains portions of the South Mountains State Park and joins with Jacob Fork to form the South Fork Catawba River. It supports good trout populations and rare invertebrates. The upper reach of Henry Fork has excellent water quality and has been designated Outstanding Resource Waters by the Division of Water Quality. Two non-functioning dams are altering the natural ecology of the stream. Benefits of dam removal include restoring stream habitat, sediment and nutrient transport, animal movements, and improving recreational opportunities. Negative impacts may include release of sediment and associated contaminant substances, and loss of wetland and bottomland habitats.

Proposed Action

- Examine the positive and negative impacts of removing the dams.

- Protect a riparian corridor along Henry Fork to protect water quality, aesthetics, rare invertebrates, and fish and wildlife habitat.

South Mountains State Park (S-3)

The South Mountains are a rugged landscape of narrow ridges, ravine-like valleys and steep slopes. The South Mountains support rare natural communities typical of the Blue Ridge but are extremely rare in the Piedmont. Over 11,000 acres of South Mountains are protected as a state park, some of which is in the Broad River basin.

Proposed Action

- Pursue further acquisition and development of the South Mountains State Park in Burke County to protect rare species and river corridors. These efforts should include trail improvements, picnic area expansion, visitor center/exhibits improvements and campground development. A further acquisition of 2,189 acres is recommended.

- Develop public access to Henry Fork from the Park.

PRIORITY III RESOURCES

Baker Mountain Significant Natural Heritage Area (S-4)

Approximately 200 acres of Bakers Mountain are owned by Catawba County and are under consideration for protection as a park. The State Natural Heritage Program has identified rare natural communities and plants characteristic of the Piedmont and Coastal Plain Oak Forests.

Proposed Action

- Extend land conservation efforts around the Baker Mountain Significant Natural Heritage Area to protect its unique resources.

Dallas Branch (S-5)

Dallas Branch is a tributary to Long Creek in Gaston County. Dallas Branch is considered to be impaired (partially supporting). At the time of NC Division of Water Quality sampling, the Dallas wastewater treatment plant had chronic problems meeting effluent toxicity test limits in their NPDES permit.

Proposed Action

- There is not enough information about the current toxicity of the Dallas wastewater treatment plant effluent. Given that Dallas Branch is on the state's 303(d) list (not yet EPA approved), additional data and information is needed to identify problem parameters in the stream. The Dallas wastewater treatment plant should conduct toxicity testing during the next permit cycle to determine the impact of this effluent on the stream.

Mauney Creek (S-6)

About 4.3 miles of Mauney Creek is listed impaired (partially supporting) due to both nonpoint and point sources (Stanley wastewater treatment plant) of pollution. This section of the creek is also a designated water supply.

Proposed Actions

- An in-depth watershed survey is needed to determine the impacts from nonpoint sources of pollution and to develop appropriate management strategies to address them. The Stanley wastewater treatment plant has made process improvements and Mount Holly is taking some of the Stanley wastewater treatment plant waste to reduce the sewer overflows that are problematic for Stanley. This cooperation reduces the number of sewer overflows for the Stanley system. The Division of Water Quality will continue to work with the Stanley wastewater treatment plant to assure permit limits are met.

South Fork Catawba River (S-7)

The South Fork Catawba River is approximately 48.5 miles in length and several major tributaries flow into the river before it joins Lake Wylie. Clark Creek, one of the major tributaries to the South Fork Catawba River, is considered impaired by the Division of Water Quality. Although the South Fork is not an impaired river, it does demonstrate notable water quality problems, including colored effluent from textile discharges. The South Fork Catawba River watershed is largely degraded in water quality, habitat and fishery resources and in need of riparian habitat protection and streambank stabilization projects.

Proposed Actions

- Protect riparian corridors along the South Fork Catawba River, especially near Cramerton, to protect water quality, rare invertebrates, wetlands, bottomland hardwoods and waterfowl habitat; along Indian Creek to protect water quality and bottomland hardwoods; and along Maiden Creek and Long Creek (Gaston Co.) to protect rare invertebrates.

- An in-depth watershed assessment is needed along Clark Creek to determine the impacts from both nonpoint and point source pollution. Because this creek is on the state's 303(d) list (not yet EPA approved), the NC Division of Water Quality will develop a management strategy for fecal coliform bacteria, turbidity and copper.

- Reductions of colored effluent from textile dischargers into the South Fork Catawba River are needed. The NC Division of Water Quality is working with the South Fork Catawba River Water Quality Alliance, Inc. Additional assessments of water quality are needed as reduction goals are met.

- Assess the effects of expanding water supply withdrawals on instream flows at Indian Creek (Town of Cherryville expansion).

- Investigate options to improve minimum releases at McAdenville and High Shoals hydropower dams on the South Fork Catawba River.

- Examine the positive and negative impacts of removing Laboratory, Southside and other non-functioning dams.

- Provide additional public hunting areas in the South Fork Catawba River basin.

- Provide new canoe access sites and portages around existing dams on the South Fork Catawba River.

UNION AND MECKLENBURG COUNTIES / CATAWBA RIVER WATERSHED

DESCRIPTION

The portion of the Catawba River watershed in Union County and the southeastern part of Mecklenburg County drains into the Catawba River below Lake Wylie in South Carolina (Figure 9). The subbasin is about 400 square miles in area. The streams in this area have very low flows during summer drought periods, and agricultural nonpoint source runoff is a major source of water quality degradation. Water quality in the major streams is generally fair. There are both aquatic and terrestrial sites containing rare species within this watershed.

PRIORITY III RESOURCES

East Fork Twelvemile Creek / Price Mill Creek (U-1)

These streams flow generally southwestward in the northwest part of Union County. Both streams provide habitat for rare fish.

Proposed Action

- Protect riparian corridors along East Fork Twelvemile Creek and Price Mill Creek to protect water quality and fish and wildlife habitat.

Roadside Rare Plant Populations (U-2)

Unusual soil types in the southwestern part of Union County provide habitat for several rare plant species, which tend to occur along open roadsides. NC Department of Transportation right-of-way maintenance practices can help to perpetuate these species. There are three known sites at this time (see Figure 9).

Proposed Action

- Manage the road rights-of-way to protect and perpetuate rare species.

Sugar Creek Watershed (U-3)

This collection of streams in the urban areas of Mecklenburg County includes Sugar Creek, Irwin Creek, Little Sugar Creek and McAlpine Creek. These waters are part of a larger watershed that spans both North and South Carolina. Water quality in these streams is impaired due to wastewater discharges and urban runoff. Problems include turbidity, fecal coliform bacteria, and poor to fair biological communities.

Proposed Action

- Implement Division of Water Quality recommendations for wastewater treatment plant optimization, monitoring, and other water quality improvement strategies.

Waxhaw Creek (U-4)

A section of Waxhaw Creek in Union County, from the vicinity of NC 200 downstream to the first tributary below SR 1117, is considered an important aquatic habitat for a rare species of freshwater mussel known as the Carolina heelsplitter. Waxhaw Creek is one of only two streams in North Carolina and approximately five streams nationwide that have populations of this federally endangered species.

Proposed Actions

- Protect a riparian corridor along Waxhaw Creek to protect water quality, the Carolina heelsplitter, and fish and wildlife habitat.

- Implement stormwater management controls, erosion controls, possibly restoration, and other means to ensure the future survival of the Carolina heelsplitter.

GENERAL ACTION ITEMS

All Waters and Wetlands

There is a general need to be proactive in protecting our streams and lakes as natural resources for water supplies, aquatic organisms, fish and wildlife habitat, and recreation. Watersheds designated as Water Supply, Outstanding Resource Water or High Quality Water should be provided the highest level of protection. These initiatives are less expensive to implement as protective measures than are restorative measures to clean up waters. Algae-related taste and odor problems, turbidity problems, aquatic macrophyte growths and over-nutrification can all be prevented with protective measures.

Proposed Actions

- Enforce and strengthen existing sedimentation and erosion control laws and ordinances at the state and local levels.
- Encourage local governments to enforce water supply watershed protection ordinances and adopt ordinances more stringent than the State's minimum requirements.
- Encourage reduction of oxygen-consuming wastes from permitted dischargers to lakes.
- Encourage local governments to adopt and enforce stormwater management programs.
- Maintain or restore a natural hydrograph for all streams.
- Encourage natural vegetated buffers along all streams and lake shorelines that are more stringent than state regulations.
- Initiate and enforce land use planning measures.
- Educate developers and the public on erosion control best management practices.
- Encourage the use of bioengineering techniques for streambank and lake shoreline stabilization.
- Encourage reduction of nutrient loading from permitted discharges and land use activities within close proximity to the lakes.
- Restore wetlands and repair degraded streams on a watershed basis.
- Develop a cooperative aquatic plant management strategy for the basin to deal with the increasing incidence of nuisance aquatic macrophytes, especially on the mainstem reservoirs.
- Encourage partnerships among non-governmental organizations, and local, state and federal agencies to improve environmental and recreational conditions throughout the Catawba River basin.

Natural Heritage Inventories

Compared with other river basins of the state, there has not been a significant detailed investigation of the Catawba River basin's biodiversity. Of the eleven counties represented in the basin, only Mecklenburg and Iredell counties have been systematically inventoried for natural heritage resources. Natural heritage inventories of Burke, Catawba, Gaston, and Lincoln counties are currently underway. Various agencies and organizations also conduct research, but often in a species-specific or geographically limited fashion.

A number of agencies and others noted the general lack of information concerning rare, threatened and endangered species or ecological units. This situation makes it difficult to protect unique natural resources in the face of increasing development. A coordinated effort is needed to survey the entire basin.

Proposed Actions

- Complete natural heritage inventories of all counties in the basin.
- Focus some research on basic life history requirements of certain species.
- Encourage landowners to provide access to their land for natural heritage inventories.

Trails

Based on the 1995 North Carolina Outdoor Recreation Plan, the counties within the Catawba River basin have a combined total of about 250 miles of trails of all type. Individual county totals range from zero trail miles in two counties to over 88 trail miles in Avery County. Of the 11 counties in the basin, seven are below the state median in trail miles per capita.

The Catawba River Canoe Trail is a multi-county, multi-agency proposal to designate and operate a canoe trail along the entire length of the Catawba River, including each of the lakes. Portages around the dams and additional access points and primitive camping sites are needed to make this trail feasible.

Proposed Actions

- Increase the total trail miles available to the public in the Catawba River basin.
- Include public trail access within protected riparian corridors whenever possible to provide recreational opportunities.
- Provide canoe portages around all of the dams in the Catawba River and South Fork Catawba River.
- Provide additional boating access points for the Catawba River Canoe Trail and other boaters. Create primitive camping sites in conjunction with selected access points.
- Establish a canoe trail on South Fork Catawba River.

Local Parks and Recreation

According to the 1995 North Carolina Outdoor Recreation Plan, the counties within the Catawba River basin have a total of about 8,796 acres of local park land and about 20,177 acres of regional park land, which includes state parks and larger county parks. Of the eleven counties in the basin, six are below the state median in local park acres per capita.

Some of the local parks provide recreational access to the lakes in the Catawba chain. However, public recreational facilities at some of the Catawba lakes are generally inadequate for the growing population in this region. Several of the counties and municipalities have plans to expand and improve their parks.

Proposed Actions

- Increase local park acreage in the basin, particularly in those counties with local park acreage below the state median.
- Complete planned facility development within local parks in the basin.
- Enhance local park and recreation opportunities throughout the basin.
- Improve public recreational access to all of the Catawba lakes. Encourage cooperative agreements between Duke Power and others so that local governments do not bear the entire cost of construction and maintenance.
- Construct public restrooms at access sites on all of the Catawba lakes.
- In addition to those items already mentioned in each watershed, the following items of local importance are listed.
  - Alexander County
    - Develop Phase I facilities at Central Park.
    - Develop facilities at Dusty Ridge Park.
  - Burke County
    - Acquire and develop three new district parks (Lake Rhodhiss, Edwards Nursery, Lake James).
    - Acquire and develop 3-5 community parks and 5-10 neighborhood parks.
  - Catawba County
    - Continue development of a park at Bakers Mountain.
  - Gaston County
    - Implement the “Connect Gaston” countywide plan for bike paths and greenways.
  - Mecklenburg County
    - Acquire, expand, and develop parks throughout the county to serve the expanding population, including two district parks near Huntersville.

Figure 1. North Carolina Catawba River Basin Natural Resource Plan Lake James

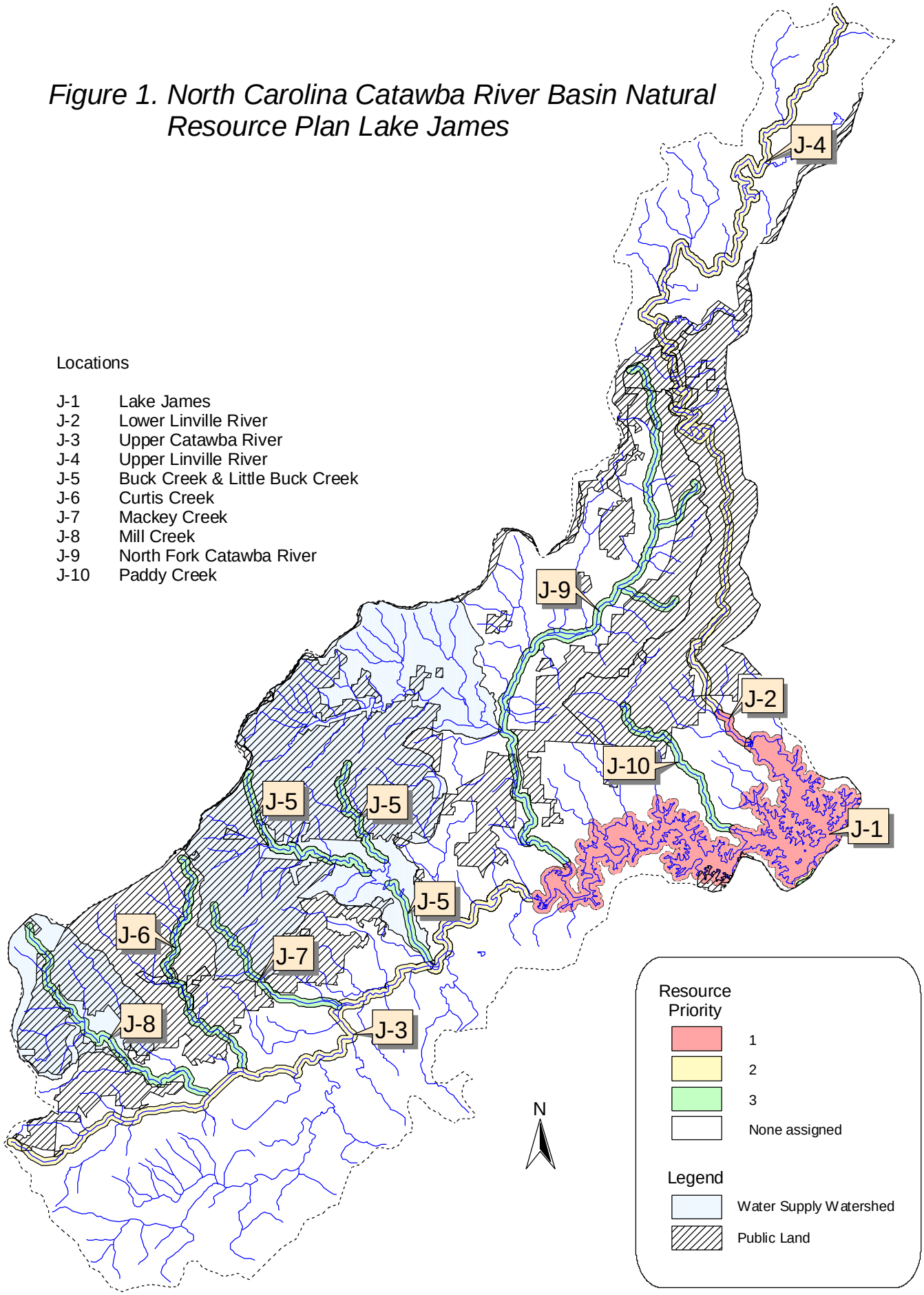

Figure 2. North Carolina Catawba River Basin Natural Resource Plan Lake Rhodhiss

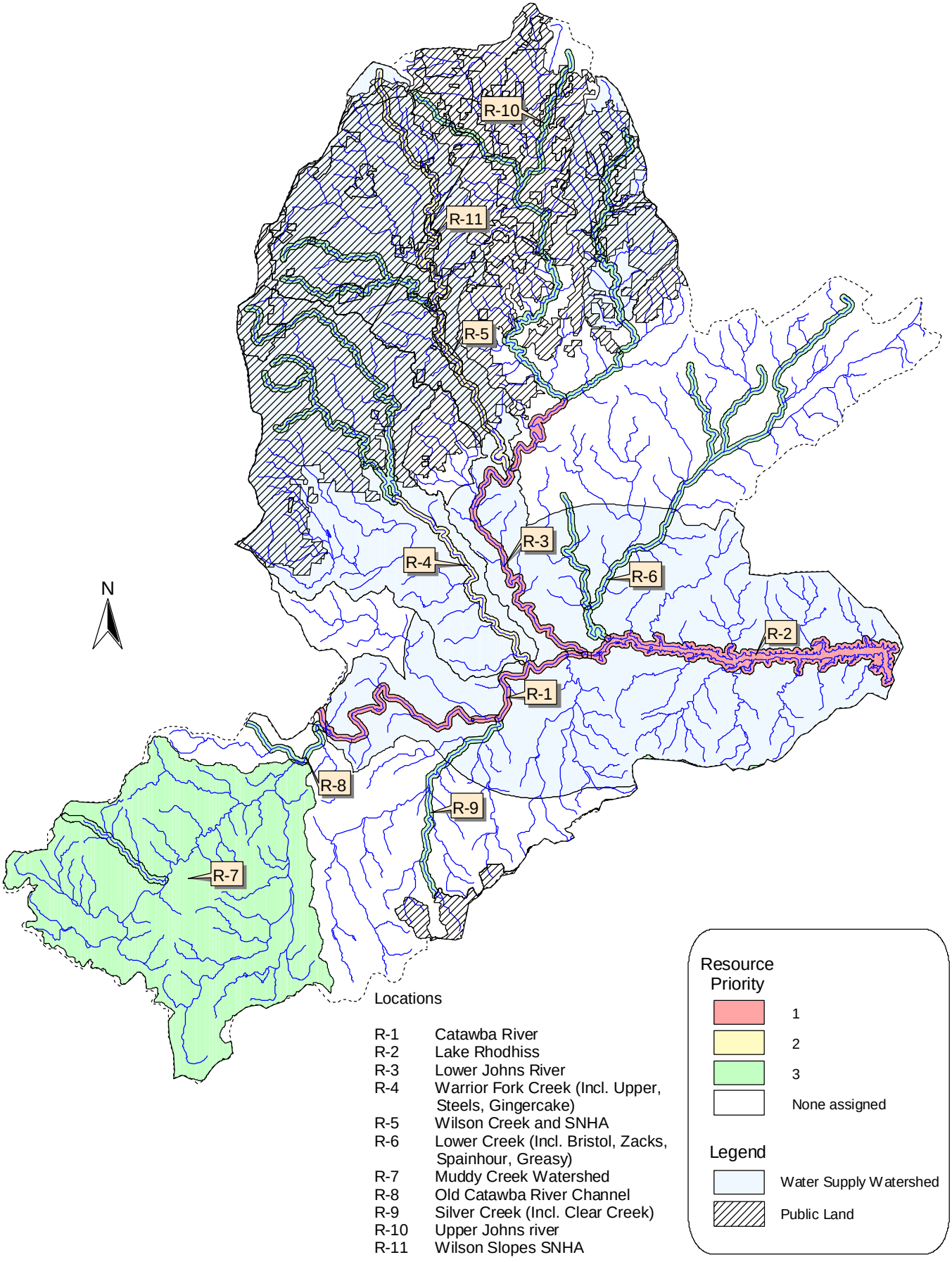

Figure 3. North Carolina Catawba River Basin Natural Resource Plan Lake Hickory

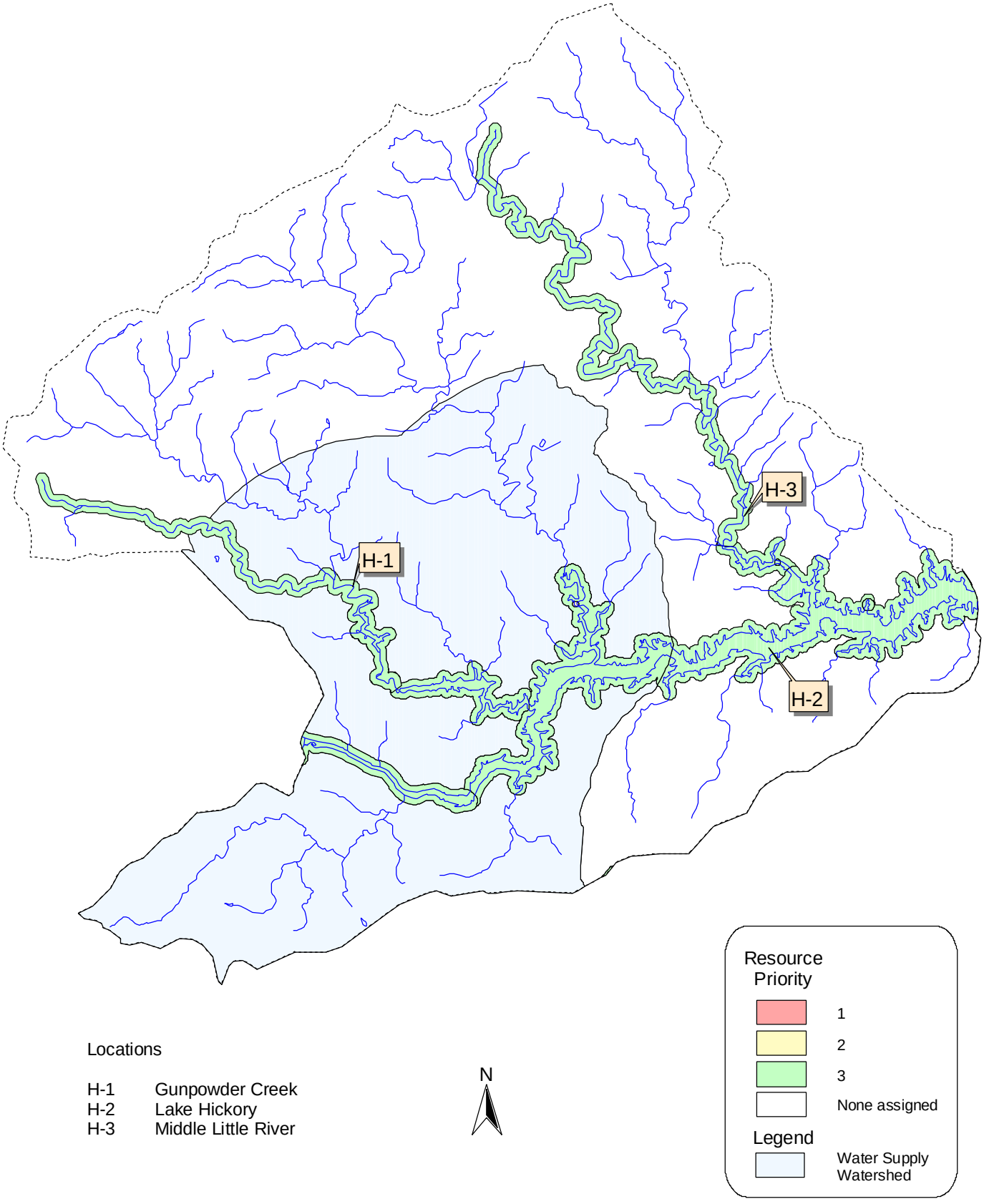

Figure 4. North Carolina Catawba River Basin Natural Resource Plan Lookout Shoals Reservoir

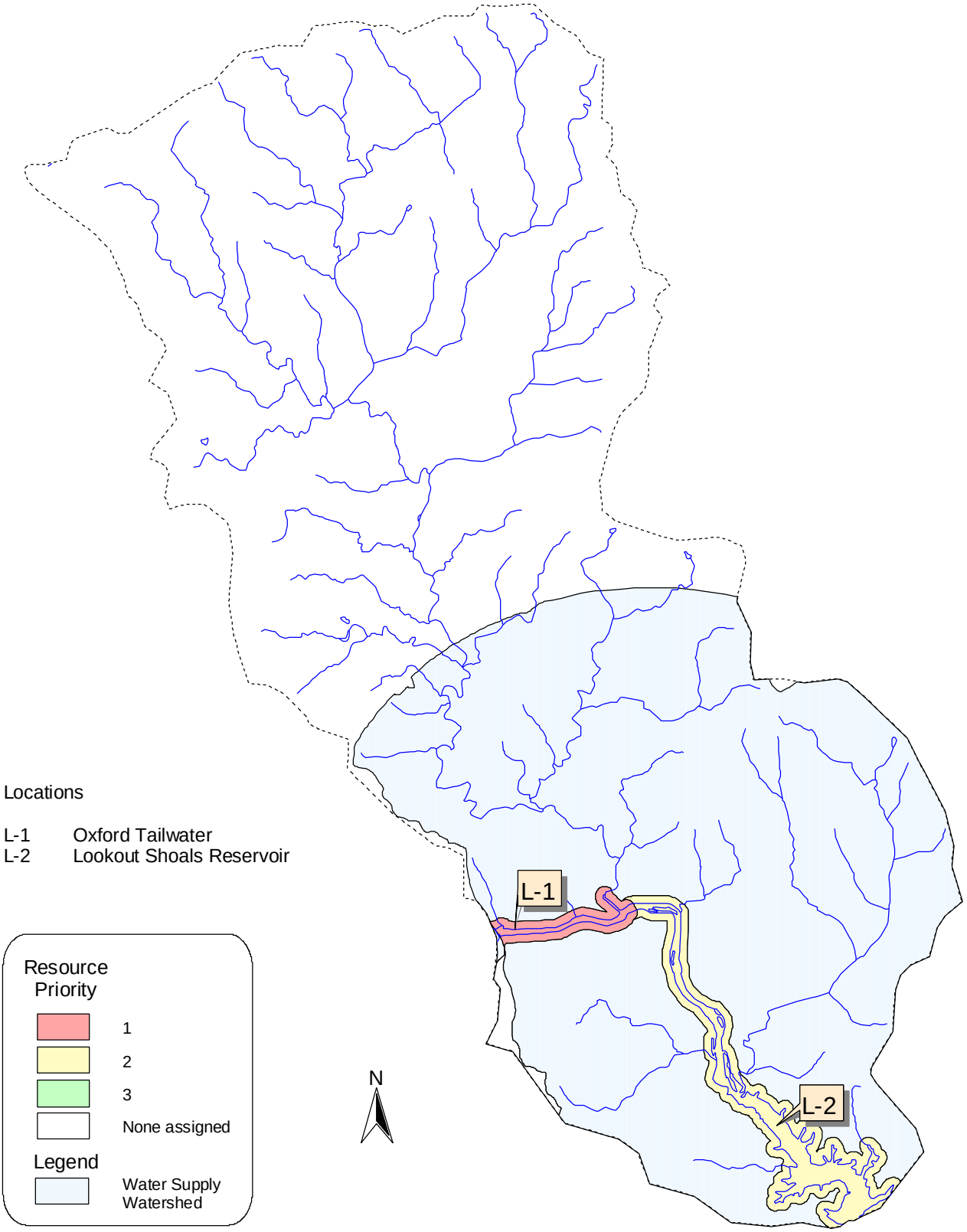

Figure 5. North Carolina Catawba River Basin Natural Resource Plan Lake Norman

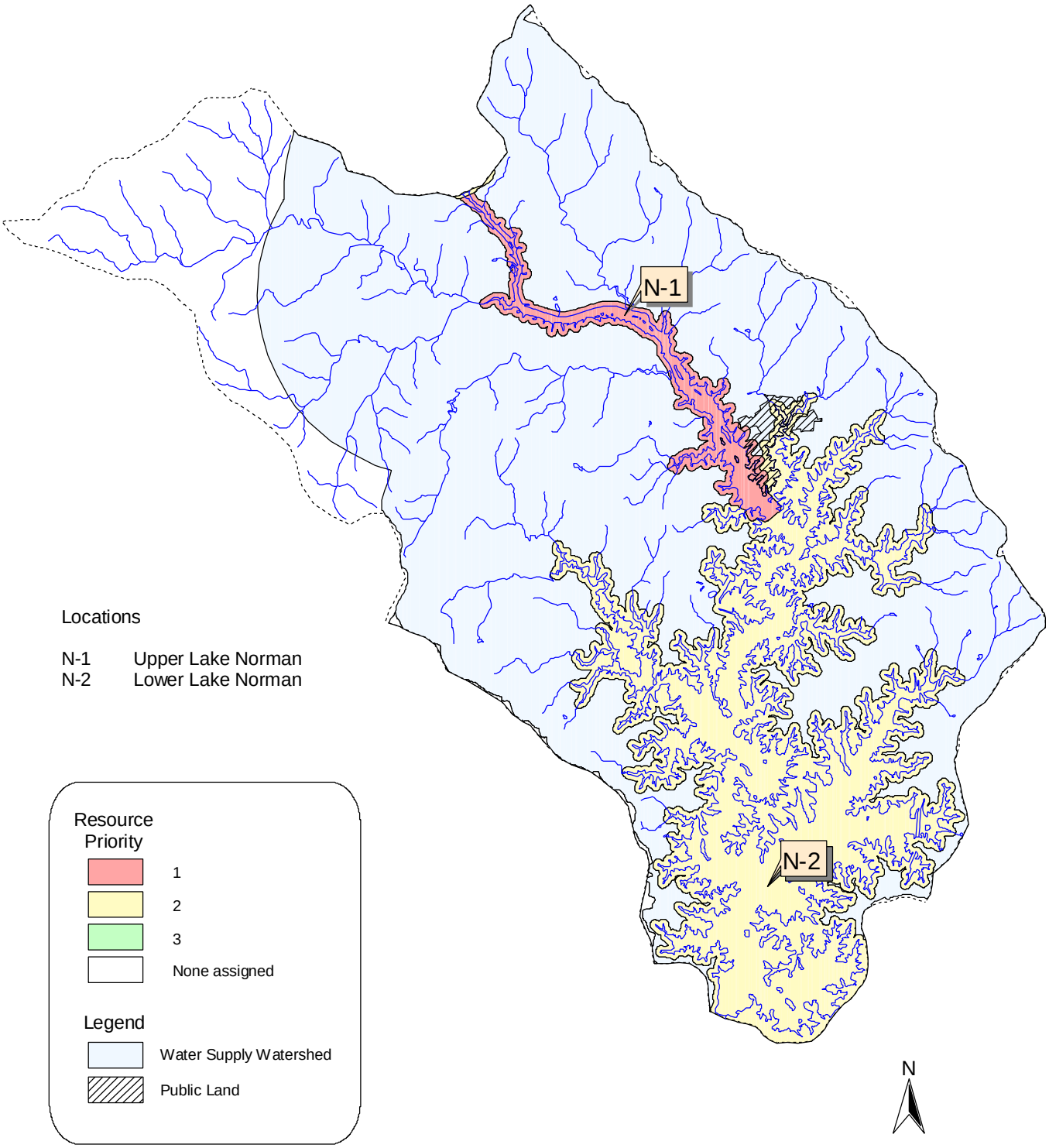

Figure 6. North Carolina Catawba River Basin Natural Resource Plan Mountain Island Lake

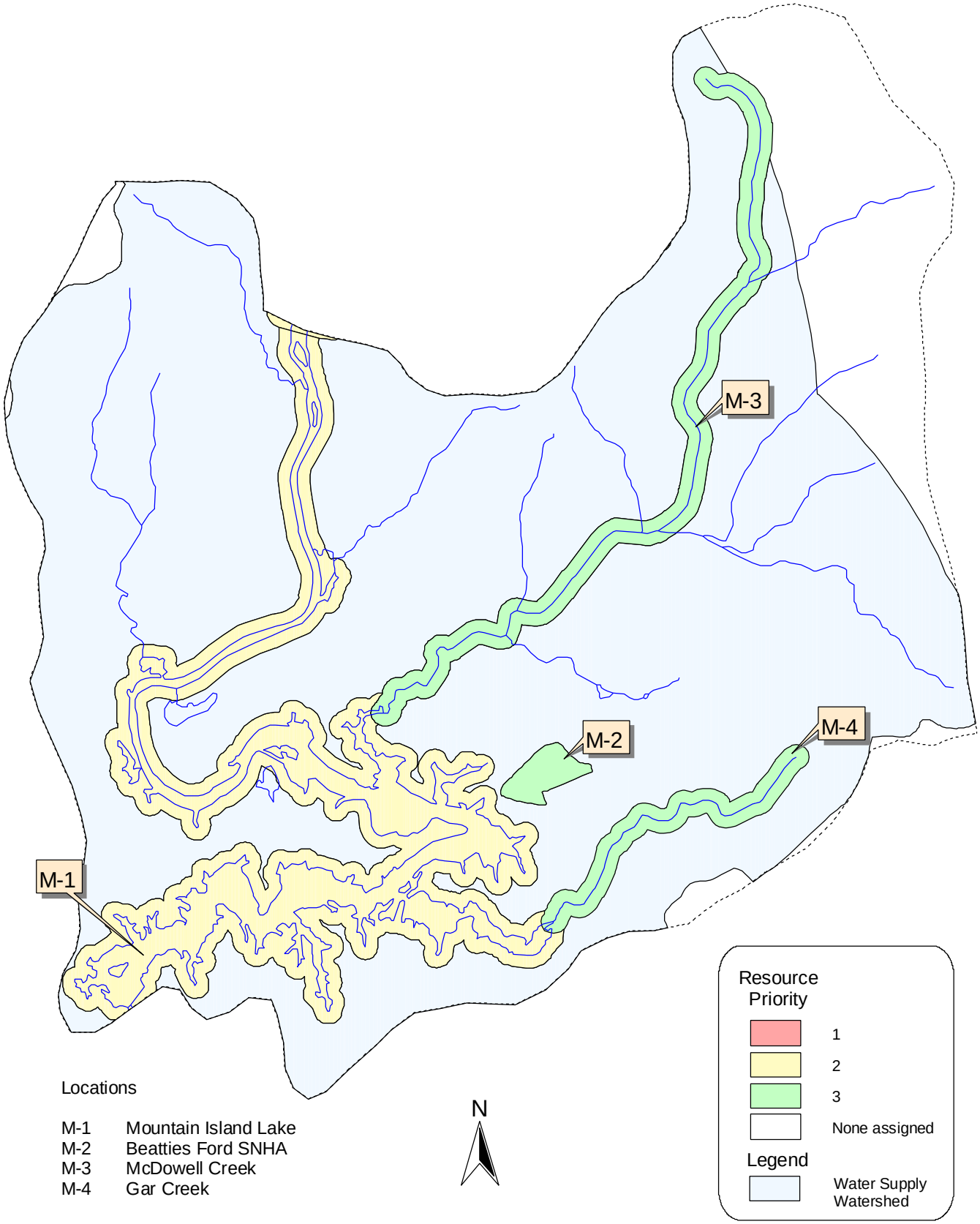

Figure 7. North Carolina Catawba River Basin Natural Resource Plan Lake Wylie

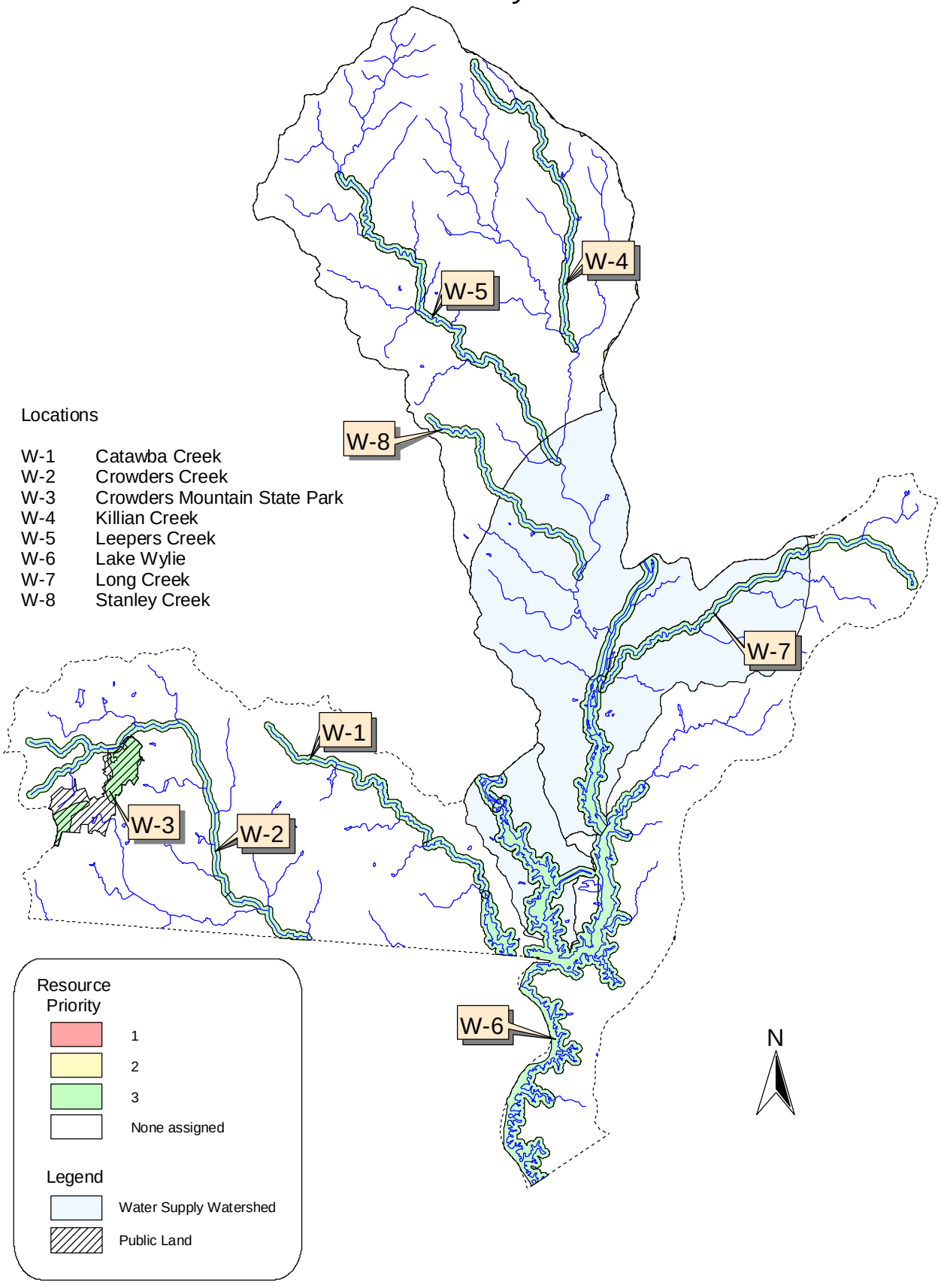

Figure 8. North Carolina Catawba River Basin Natural Resource Plan South Fork Catawba River

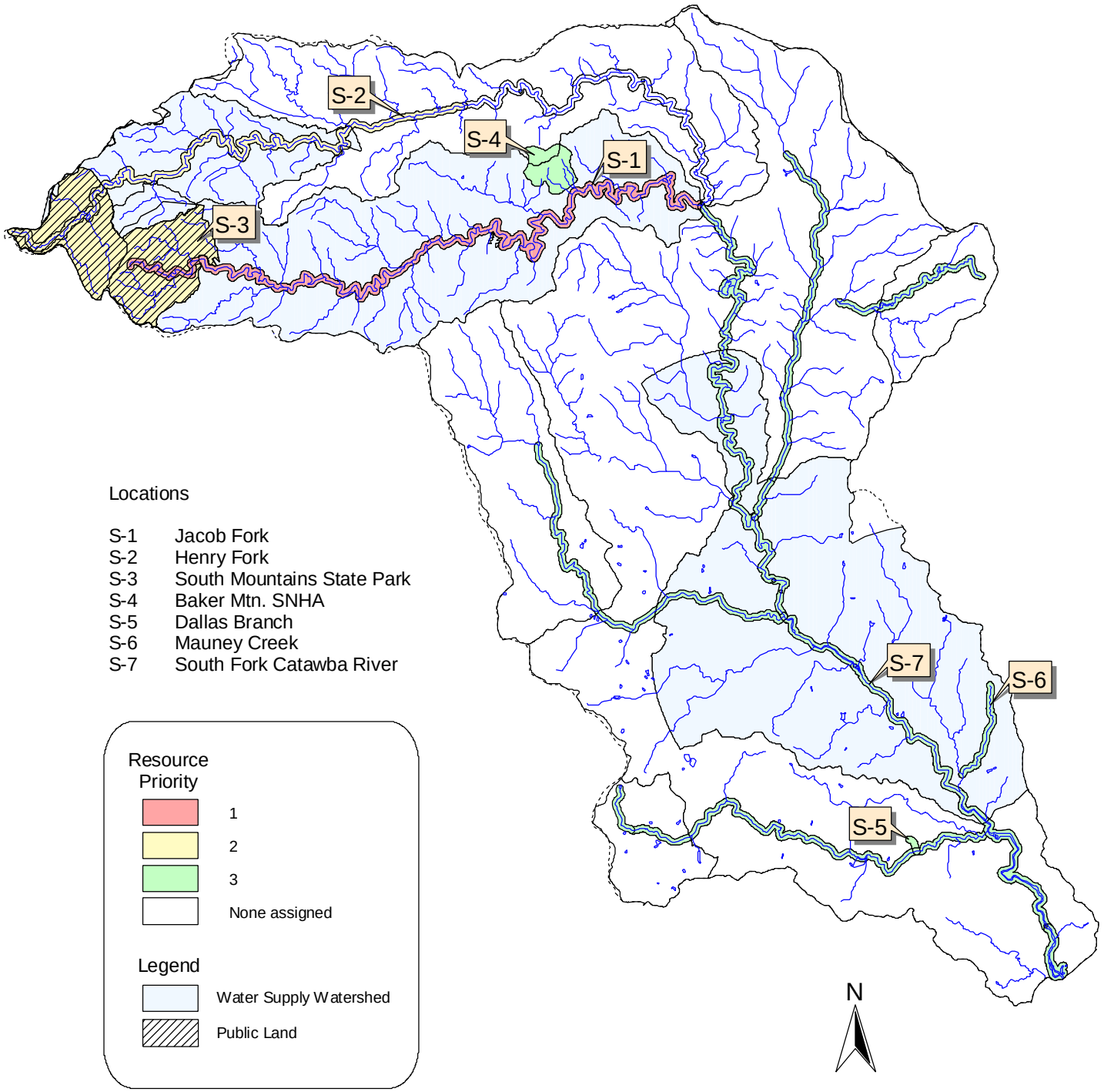

Figure 9. North Carolina Catawba River Basin Natural Resource Plan Mecklenburg Co. and Union Co.