Lynches River Eligibility Study

for the

South Carolina Scenic Rivers Program

South Carolina Department of Natural Resources
Land, Water, and Conservation Division
Scenic Rivers Program
1000 Assembly Street, Suite 354
Columbia, SC 29201
(803) 734-9100

Contributors: Bill Marshall, Mary Crockett, Stuart Greeter, Sean Taylor, Richard Lacey, Elizabeth Osier, Fritz Rohde, Dr. Wayne Starnes, Laurel Barnhill, Barry Frick, Dave Lansbury, Julie Wilkie, Robbie Ervin, Gail Gandy, Roger Hall, Joey Holleman, Dave Green

Final Report – April 2008

Contents

Study Summary and Recommendations

A 57-mile segment of the Lynches River was given State Scenic River status in 1993. An additional 54-mile segment is currently proposed for State Scenic River designation, under the South Carolina Scenic Rivers Act. This report presents the findings and recommendations of a scenic river eligibility study conducted by the South Carolina Department of Natural Resources (SCDNR) Scenic Rivers Program in 2007.

The study area for the proposed State Scenic River includes the 54-mile river corridor from Lynches River County Park to the confluence with the Great Pee Dee. The entire study area lies within Florence County and is shown on the map in Figure 1.

Findings from the Eligibility Study

To qualify as eligible for State Scenic River status, Section 29-49-70 of the South Carolina Scenic Rivers Act states, "the river or river segment must possess unique or outstanding scenic, recreational, geological, botanical, fish, wildlife, historic or cultural values" and "the level of pollution of a river's waters must be considered." These criteria and other factors are used to determine a river's eligibility for State Scenic River status.

Findings from an eligibility study demonstrate that the Lynches River study area does possess outstanding river-related values and is eligible for State Scenic River status. Those values judged to be of outstanding significance include the river's scenic, recreational, fish, and wildlife values.

The basis for the river's eligibility and a description of its significant values are summarized below.

The South Carolina Rivers Assessment

The *South Carolina Rivers Assessment* of 1988 provides comparative information about the state's river resources. Ten of the 16 river-resource categories evaluated in the *Rivers Assessment* are directly relevant to scenic river eligibility. Taken as a whole, the 54-mile study area of the Lynches River was rated as having superior resources of statewide or greater significance in three scenic-river related categories: flatwater boating, backcountry boating, and undeveloped shoreline. The study area was also rated as having outstanding resources of regional significance in two scenic-river related categories: inland fisheries and recreational fishing. The study area was rated a resource of local significance in the wildlife habitat category.

Scenic Characteristics

The Lynches provides the outstanding scenery of a South Carolina Coastal Plain blackwater river: clear, dark waters with sandy river bottoms and bars, and winding water trails lined by cypress-tupelo swamps and bottomland hardwood forests. Human development activities have visually affected approximately two miles (roughly four percent) of the total 54-mile Lynches River segment being assessed in this study. The remaining 52 river miles are visually free of

human development and provide a setting where natural conditions surround the river user along most of the river's length. Although most of the river is open for easy passage, the channel does vary greatly. On certain short sections, the river braids into multiple small streams. And on other locations the river can be blocked with fallen trees. These variations add to the experience of those willing to explore the river and are the result of a river allowed to function as a natural entity. These variations also enhance the habitat for fish and other wildlife. The channel width may vary from four feet in tight meanders, to several hundred feet in sections that form lakes. Downstream views can range from 10 feet to 800 feet. Indeed, the natural variability of this natural river may be its most valuable asset.

Recreational Uses

The Lynches River is an outstanding recreational resource for fishing and paddling, and the area is within easy driving distance of several large population centers, making the river's recreational opportunities accessible to many thousands of people. Regular river access is available throughout the 54-mile study area at 14 points; three paved ramps and 11 nonpaved. At normal water levels, all sections of the river are accessible to paddle-boats and most sections are accessible to motor-boats. The only exception is the last six miles, prior to the confluence with the Great Pee Dee River. There the Lynches River braids into multiple small channels. This section was not accessible for this study, due to low water levels.

Geological Resources

The Lynches River in Florence County features oxbow lakes, sloughs, bluffs, sand ridges, and other fluvial formations that have been created by the river meandering across a floodplain. These type features are common to Coastal Plain rivers and many of these features can be seen from the main river channel. The relatively flat terrain and the sandy soils produce the swamplands and clear blackwater conditions that characterize this river.

Botanical Values

The vegetative communities of the Lynches River and adjacent land are typical of blackwater rivers and bordering swamplands in the Coastal Plain of South Carolina. The natural communities with high resource value include cypress tupelo swamp, oak hickory floodplain forest, and sandy bluffs that could support long leaf pine. Botanical species of State Concern found along the Lynches include Georgia Leadplant (*Amorpha Georgiana var Georgiana*), Piedmont Three-Awned Grass (*Aristida condensata*), and Southeastern Tickseed (*Coreopsis gladiata*).

Fish and Wildlife Values

The Lynches River has a high diversity of fish species, primarily due to the diversity of habitats it flows through; Piedmont, Sandhills, and Coastal Plain. Fifty-four species were collected during a three-year study, and with the inclusion of tributary streams, a total of 78 species occur in the Lynches River drainage. Ten species are designated as either "High" or "Highest" Priority in the South Carolina Comprehensive Wildlife Conservation Strategy (CWCS, Kohlsaat et al., 2005). The high quality habitat within the designated reach of the Lynches River supports three species of diadromous fishes, which migrate between freshwater

and saltwater habitats. Additionally, several other species are undocumented in the Lynches, but confirmed from the Great Pee Dee River near its confluence with the Lynches (F. Rodhe, pers. comm.). For example, the shortnose sturgeon, a Federally Endangered species that inhabits coastal rivers of South Carolina, is expected to occur, as well as Atlantic sturgeon and hickory shad, both "of state concern" (Kohlsaat et al., 2005).

The Lynches River floodplain and adjacent uplands contain large areas of undeveloped forestland and wetlands that provide excellent habitat for a variety of wildlife species. Seventy-three (73) percent of the adjacent acreage in the study area is in tracts of 100 acres or larger. This provides habitat for many wildlife species and also "area sensitive" species, which are becoming rare. Nine "area sensitive" species can be observed here. One Federally endangered bird species, one State threatened reptile, three State concern animal species and three State concern plant species occur here. The Lynches River landscape provides unique opportunities to observe a variety of wildlife species.

Historic and Cultural Values

The Lynches, like most rivers of South Carolina's Coastal Plain, is a natural resource that has supported human settlements for thousands of years and to this day continues to be valued by the surrounding communities. The study area of the lower Lynches, however, is not noted for any outstanding archaeological discoveries. Prehistoric inhabitants utilized the Lynches River floodplain for hunting, foraging, or cultivating. Permanent living sites were established on the adjacent bluffs and sand ridges. The river served as a transportation route from the very beginning of settlement (middle 1700's), bringing settlers and supplies up from the Winyah Bay area and taking agricultural products, lumber, naval stores, and other goods down to market. Commercial navigation on the upper Lynches may have persisted for roughly 100 years but by 1856 the railroads had taken the place of the river for transporting goods to the markets at Georgetown and Charleston.

Streamflow and Water Quality

The Lynches River is free flowing (not dammed) and the natural, physical characteristics of the river appear to be unaltered by channelization projects. Average daily streamflow, measured at Effingham, is about 777 cubic feet per second (cfs) and the streamflow can be expected to equal or exceed 338 cfs 80 percent of the time. The Lynches is a blackwater river, stained a dark tea color by chemicals known as tannins, which are leached from tree leaves and branches in the surrounding swamps. It should be noted that the all-time minimum flow (173 cfs in 2002) has been exceeded during the current drought conditions. In 2007, water flow in the Lynches has been as low as 136 cfs.

Analyses of water quality monitoring data by the S.C. Department of Health and Environmental Control (SCDHEC) indicate that, overall, the study area of the lower Lynches River has acceptable water quality conditions; however, there are a few problems. Two water-quality monitoring stations are located on the lower Lynches River. Recreational uses are fully supported at both stations, which means bacteria concentrations appear to be safe for swimming and similar water-contact recreation. Aquatic life uses are fully supported at the upper station

but not at the lower station, which presents high levels of copper. Another problem affecting the entire river is mercury contamination of fish, as mercury in the atmosphere has polluted the aquatic food chain. The Lynches River is now under a fish consumption advisory by SCDHEC advising the public to limit the eating of certain types of fish caught from the river.

Land Use Conditions and River Classifications

The floodplain of the Lynches River can be very narrow or can extend to over a mile in width. It averages about a half-mile in width. The dominant land-cover types in this corridor are wetland forests and upland forests. Most of these forestlands appear to be managed for timber, wildlife, and recreational uses. Along most of its route, the Lynches River channel is isolated from high ground as it meanders through the floodplain forests.

Human development along the river is generally concentrated in areas where the river channel meanders near high ground and where there is a nearby road for access. Recreational access sites and house sites are the typical human-development use seen along the river; and roughly 40 such sites occur in the study area. Roads, utility corridors, and public landings impact the character of the river; five highways, two railroads, six powerline crossings, 14 public landings (three paved and 11 dirt) are located on the river.

Rivers within the State Scenic Rivers Program are classified according to the land use conditions, degree of naturalness, and extent of development on the river and adjacent lands. Eligible rivers must be classified according to the type(s) that best fits the river or segments of the river. The entire 54-mile section of the Lynches River study area in Florence County is suited to the "scenic river" class.

Public Notification and Public Input

Public meeting notices were published in the December 2007 *State Register* and in newspapers with local and statewide circulation. A press release announcing the scenic river proposal and the public meetings was distributed. Properties adjacent to the Lower Lynches River and other interested citizens were notified by press releases, the DNR web page, and by letters of notification describing the proposed designation. Several local and regional newspapers and news broadcasters produced stories about the proposed designation. A draft report of the Lower Lynches Eligibility Study was posted on the DNR web site for more than 30 days; paper copies of the draft report were distributed to all river landowners by mail with a letter of notification.

Approximately 60 people attended the public meeting (January 28, 2008) concerning the Lower Lynches River. SCDNR staff presented an overview of the Scenic Rivers Program and findings of the eligibility study. The majority of the public meeting time was used to address the comments and questions of those in attendance. Common questions asked by the citizens and addressed by SCDNR staff related to: (1) concerns about increased regulation on property owners; (2) how advisory councils are formed and how they function; and (3) what the scenic rivers program can accomplish for the river. Many citizens expressed strong support for the designation, appreciation and concern for the river, and a desire for assistance from the SCDNR Scenic Rivers Program. Notice of the DNR Board approval was published in the March 2008

State Register as well as many local and regional newspapers.

Recommendations

Based on the findings presented in this report, the Lynches River in Florence County is considered eligible for designation as a State Scenic River. The SCDNR staff recommends that the 54-mile section of the Lynches River in Florence County be designated as a State Scenic River from the Lynches River County Park to the confluence with the Great Pee Dee River.

Approvals

The Land, Water, and Conservation Division Advisory Council approved the above recommendation in January 2008.

At its regular meeting held on February 15, 2008, the South Carolina Department of Natural Resources Board considered the findings of this study and voted, unanimously, to accept the staff recommendation as presented above.

Contact Information

For additional information about this study report and the S.C. Scenic Rivers Program, please contact SCDNR staff at 1000 Assembly Street, Columbia, SC 29201. Telephone: (803) 734-9100. Email: MarshallB@dnr.sc.gov. Columbia staff includes: Bill Marshall, Mary Crockett, and Stuart Greeter.

Introduction

In the summer of 2006, the South Carolina Department of Natural Resources (SCDNR) received a number of requests to consider an additional 54 miles of the Lynches River in Florence County for designation as a State Scenic River. After careful consideration, the Lynches Scenic River Advisory Council initiated a study to assess the eligibility of the lower Lynches for State Scenic River designation in April of 2007. This report presents the findings and recommendations of lower Lynches River eligibility study and provides a description of the river and surrounding lands.

An additional 54-mile segment of the Lynches River is proposed for designation as a State Scenic River under the South Carolina Scenic Rivers Act. The study area and the proposed State Scenic River includes the 54-mile river corridor in Florence County that begins at the downstream end of Lynches River County Park and extends to the confluence with the Great Pee Dee River. (See Figure 1, page 7, for map of project area.)

The Lynches River between Lee State Park and Lynches River County Park is already designated as a State Scenic River. That section covers approximately 57 miles and was designated a State Scenic River in 1994.

The South Carolina Scenic Rivers Program

The purpose of the Scenic Rivers Program is to protect the State's unique and outstanding river resources. To accomplish this purpose, a cooperative, voluntary management program has been created to involve landowners, community interests, and the SCDNR in a partnership, working together toward common river-conservation goals.

Designating a State Scenic River requires legislative action by the South Carolina General Assembly. However, the designation process begins at the local level and requires the support of local citizens, landowners, and elected officials. The steps in the designation process determined by the South Carolina Scenic Rivers Act are as follows:

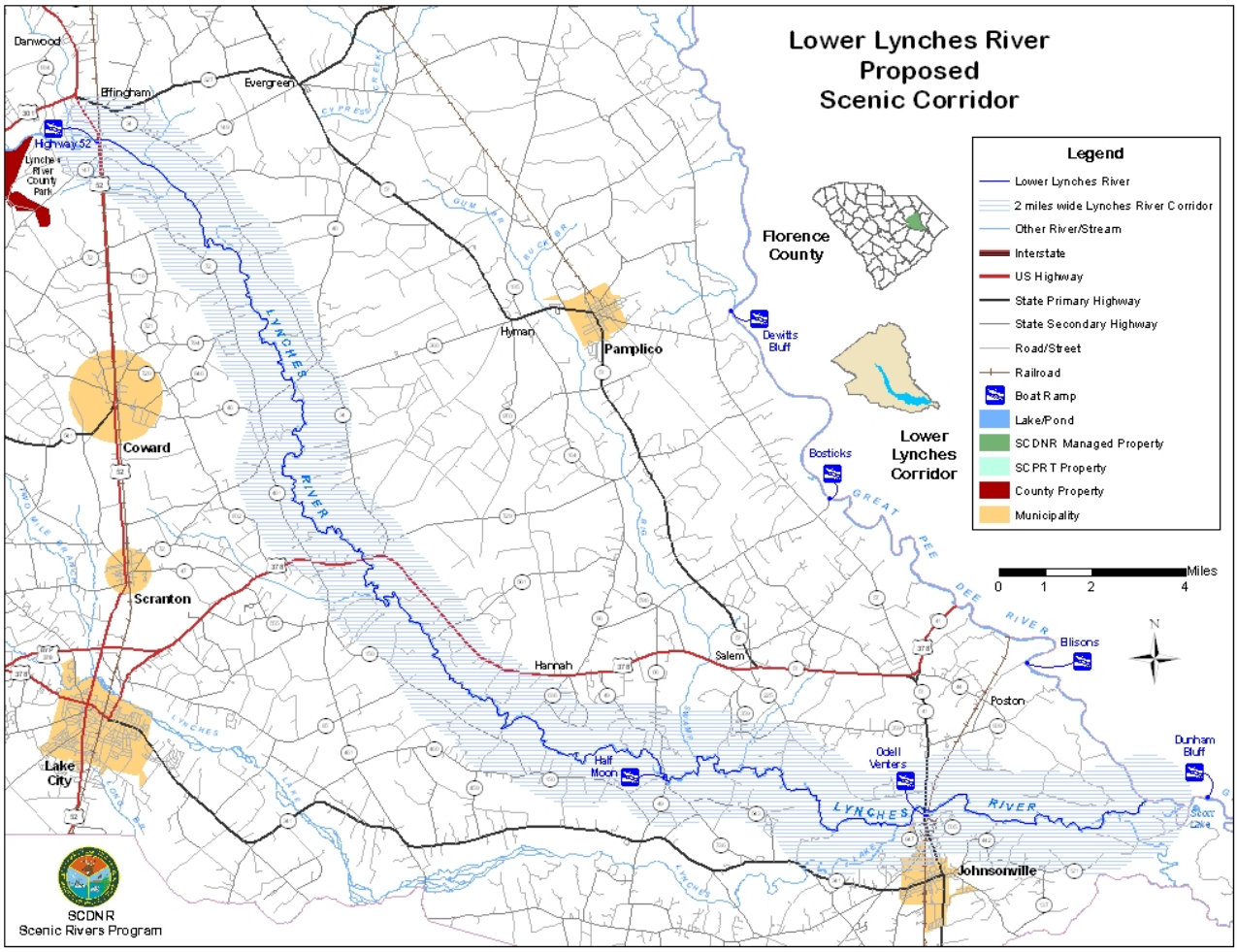
- First, a local request for scenic river designation is made and then the SCDNR conducts a scenic river eligibility study. (In this case, elected officials, landowners and a conservation group made the request and this eligibility study was initiated in April 2007.)
- Second, all river landowners and the general public are notified of the proposal and invited to public meetings to ask questions or express concerns. (A letter notifying landowners of this process was mailed on September 19, 2007, and a public meeting is scheduled for January 28, 2008, in Johnsonville.)
- Third, each county council of the affected river-bordering counties is asked to give their approval of the Scenic River proposal. (With this proposal the affected county is Florence. The Florence County Council expressed its support for the designation on August 16, 2007.)

- Finally, the SCDNR Board reviews the proposal and a bill is introduced in the General Assembly. When the bill is passed, a new State Scenic River is officially designated.

After the designation process is completed the SCDNR will establish a Scenic River Advisory Council to develop and implement a river management plan. The advisory council will be made up of landowners, river users, and representatives of groups with an interest in the river. Advisory councils may have six to ten voting members, the majority of whom must represent river-bordering landowners. Additional people are typically included on advisory councils as ex-officio members to bring broader expertise and representation to the group. In this case, the existing Lynches Scenic River Advisory Council will be expanded to include additional representatives from the downstream addition.

Study Boundaries

The boundaries for this eligibility study are defined by the 54-mile river corridor in Florence County that extends from the downstream end of Lynches River County Park to the confluence with the Great Pee Dee River. Along the length of the river, the boundaries are generally defined by the nearest paved highways that parallel the river and its floodplain.


Lower Lynches River
Proposed
Scenic Corridor
Legend
Lower Lynches River
2 miles wide Lynches River Corridor
Other River/Stream
Interstate
US Highway
State Primary Highway
State Secondary Highway
Road/Street
Railroad
Boat Ramp
Lake/Pond
SCDNR Managed Property
SCPRT Property
County Property
Municipality
Florence County
Lower Lynches Corridor
Miles
0 1 2 4
N
Danwood
Effingham
Evergreen
Highway 52
Lynches River County Park
Coward
Scranton
Lake City
Hyman
Pamplico
Dewitts Bluff
Bosticks
Hannah
Salem
Half Moon
Odell Venters
Blisons
Poston
Dunham Bluff
Johnsonville
LYNCHES RIVER
GREAT PEE DEE RIVER
SCDNR
Scenic Rivers Program

The Lynches River Watershed

The watershed of the upper Lynches River, that portion which lies within South Carolina, is approximately 1,386.8 square miles (887,524 acres) in size. Major tributaries in the Lynches watershed include Lake Swamp, Big Swamp, and Sparrow Swamp in Florence County; Little Lynches River in Kershaw County; and Flat Creek in Lancaster County. The headwaters of the Lynches extend approximately six miles into North Carolina and drain a portion of Union County. This predominantly rural area has approximately 1,624 stream miles and 1,310 acres of lake waters. After merging with the Great Pee Dee River, the Lynches River flows unencumbered into Winyah Bay at Georgetown where the Lynches waters eventually join the Atlantic Ocean.

The Lynches is a blackwater river. The water has a dark tea color because chemicals known as tannins stain the water. Tannins are leached from leaves and other organic material decomposing in the surrounding swamps.

The watershed of the Lynches River is rural in nature, with agriculture and forestry the predominant land use activities. According to the South Carolina Department of Health and Environmental Control (SCDHEC, 2000), the mix of land use and land cover types within the South Carolina portion of the watershed is as follows:

- Agricultural land 30.3%
- Forested land 45.0%
- Scrub/shrub land 16.8%
- Forested wetland 6.4%
- Urban land 0.7%
- Barren land 0.4%
- Water 0.3%
- Nonforested wetland 0.1%

The year 2000 population density of Florence County is 157.4 people per square mile. The population density for the state of South Carolina is 133. The largest population centers within the study area include Johnsonville, Lake City, Scranton, Coward, and Pamplico. The City of Florence lies within ten miles of the Lynches River. The Florence Metropolitan Statistical Area supports a rapidly growing population of 193,155 people. Myrtle Beach, Georgetown, and Sumter are also within an hour's driving time of the Lynches River.

Assessment of the River's Resource Values and Conditions

As described in the Introduction, the subject of this study is a 54-mile segment of the Lynches River in Florence County. To determine whether this or any other river qualifies as eligible for State Scenic River status, Section 29-49-70 of the "South Carolina Scenic Rivers Act" states that the "river or river segment must possess unique or outstanding scenic, recreational, geological, botanical, fish, wildlife, historic or cultural values" and "the level of pollution of a river's waters must be considered." These factors are addressed in this section following a presentation of relevant findings from the *South Carolina Rivers Assessment*.

South Carolina Rivers Assessment Findings

An important source of information for understanding South Carolina rivers is the *South Carolina Rivers Assessment* (SCWRC, 1988) as it provides comparative information about the state's river resources which is useful to considerations of State Scenic River designations. The *Rivers Assessment* of 1988 involved over 70 individuals with an array of river resource expertise in an evaluation of the state's rivers. Using primarily personal knowledge and opinion, the experts assembled into 16 committees and evaluated over 1,400 rivers and river segments and classified the rivers according to their significance for 16 different resource categories.

Ten of the 16 resource categories evaluated in the Rivers Assessment are directly relevant to scenic river eligibility. These relevant categories include: undeveloped rivers, natural features, flatwater boating, backcountry boating, whitewater boating, recreational fishing, inland fisheries, wildlife habitat, historic and cultural values, and water quality.

Taken as a whole, the 54-mile study area of the Lynches River was rated as having superior resources of statewide or greater significance in three categories relevant to the Scenic Rivers Program. The study area was also rated as having outstanding resources of regional significance in two of these categories and resources of local significance in one category. The Lynches River was "not-rated" in four of these categories.

Results for all 16 resource categories and how they were assessed for the Lynches River in Florence County are presented in Table 1 and discussed below.

Superior River Resources

In the *Rivers Assessment*, the Lynches River in Florence County was rated as a superior resource of statewide or greater significance for three categories: undeveloped rivers, flatwater boating, and backcountry boating.

All of these resource categories take into account the perceived scenic and natural quality of the river in addition to other factors. The flatwater boating category reflects good water quality and good river access. The backcountry boating category reflects good opportunity for extended river trips that involve overnight camping. The undeveloped rivers category accounts for man-made structures and reflects the natural character in the river corridor.

Outstanding River Resources

In the *Rivers Assessment*, the Lynches River in Florence County was rated an outstanding resource of regional significance in five categories: industrial, timber management, recreational fishing, inland fisheries, and water supply.

The industrial category rates rivers based on their assimilative capacity for wastewater. The timber management category rates the potential timber productivity within the river corridor. Recreational fishing accounts for the perceived fishing quality, aquatic habitat, scenic quality, and access. The inland fisheries category accounts for species composition and the perceived aquatic habitat quality, fishery quality, and quality of recreational use. The water supply category rates rivers according to the water's quality, quantity, treatability, and accessibility.

Significant River Resources

In the *Rivers Assessment*, the Lynches River in Florence County was rated as a resource of local significance in two categories: agriculture and wildlife habitat.

The agriculture category reflects the suitability of adjacent lands for agriculture and the use of the river as a water source. The wildlife habitat category reflects perceived habitat quality, suitability of the habitat, and quality of the hunting opportunities.

River Resources not Evaluated

In the *Rivers Assessment*, the Lynches in Florence County was not evaluated for six categories: historic and cultural values, natural features, whitewater boating, urban rivers, utility rivers, and water quality.

Table 1. *South Carolina Rivers Assessment* findings: Lynches River in Florence County.

Resource Category	**Value Class**
Agriculture	Value Class 3: Significant resource of local significance -
Historic and Cultural	Not rated -
Industrial	Value Class 2: Outstanding resource of regional significance -
Timber Management	Value Class 2: Outstanding resource of regional significance -
Undeveloped Rivers	Value Class 1: Superior resource of statewide or greater significance -
Natural Features	Not rated -
Whitewater Boating	Not rated -
Flatwater Boating	Value Class 1: Superior resource of statewide or greater significance -
Backcountry Boating	Value Class 1: Superior resource of statewide or greater significance -
Recreational Fishing	Value Class 2: Outstanding resource of regional significance -

Inland Fisheries	Value Class 2: Outstanding resource of regional significance -
Wildlife Habitat	Value Class 3: Significant resource of local significance -
Urban Rivers	Not rated -
Utility Rivers	Not rated -
Water Quality	Not rated -
Water Supply	Value Class 2: Outstanding resource of regional significance -

Land Use and Ownership Patterns

Land use and ownership patterns affect the character of rivers and present different management alternatives for the Scenic Rivers Program. Land use and ownership patterns can be important factors affecting scenic quality, wildlife habitat, and water quality. Land use conditions are also the determining factor for how a river is classified within the State Scenic Rivers Program. After the river is determined eligible, it must be classified according to the category (natural, scenic, or recreational) that best fits each eligible river segment. Classification is based on the degree of naturalness and extent of development on the river and adjacent lands at the time of the study.

To better understand land use and ownership patterns, an inventory was conducted for the river segment under study. Land use and land cover characteristics were assessed, human development features in the river corridor were inventoried, and the river mileage that is visually affected by human development was estimated. Finally, all parcels of land that connect with the river and their acreages (when available) were inventoried. The land use inventories were conducted using 2006-07 aerial photography, topographic and county highway maps, and field trips to the river. The parcel-ownership records were collected from the county tax assessor.

Land Use

As mentioned earlier in the report, the watershed of the Lynches is rural and the major land-use and land-cover types include forests, agriculture, and scrub/shrub vegetation. Only a small portion of the watershed is in urban or built-up land uses. Land use adjacent to the Lynches River is controlled by the floodplain of the river where floodwaters and wet soils generally discourage development.

The floodplain of the Lynches forms a corridor a half-mile (0.5 mile) wide along most of its length. It does reach 1.5 miles in some areas. The dominant land use is forest. Within the river floodplain the vegetation pattern reflects the gradient of elevation and moisture. Adjacent to the river channels and in sloughs, the floodplain has standing water and saturated soil conditions that create a cypress-tupelo swamp forest, and associated with these areas on slightly higher ground are the bottomland hardwood forests. Moving further away from the river channel, the outer floodplain transitions to pine-mixed hardwood forests. In many places the outer, highest areas of the floodplain support planted pine stands and agricultural fields.

The forests of the Lynches River floodplain appear to be managed for timber, agriculture, wildlife, and recreational uses. Recent logging of timber has occurred in several locations along the river and the logging practices typically involve clear-cutting large areas and leaving in place the required "streamside-management zone," a forested buffer strip left along the banks of the river and all tributary streams.

Human development along the river is generally concentrated in areas where the river channel meanders near high ground and where there is a nearby road for access. Recreational access sites or house sites with associated docks are the typical human development scenes on the river. Roughly 40 places dispersed along the river exist where a remote, single site next to the river has been cleared to allow for access to the river or for building a house. Excluding these 40 remote/single sites, there is one area where development is clustered. That area is at Johnsonville, where houses and industrial development are located along the river(Sections VI and VII below).

Other types of development that affect the character of the river are public utilities and infrastructure. The corridors of five highways (US 52, SC 46, US 378, SR 49, and SR 51/41), two railroads (CSX at Effingham and Seaboard at Johnsonville), and six power-lines cross the Lynches River. Fourteen public landings are located in the study area; three are paved landings and 11 are dirt landings or "drop-ins." The paved landings are co-located within the developed areas at highway crossings US 52, SR 49, and SR 51/41.

Overall, the land use inventory indicates that approximately two miles (four percent) of the river within the study area is visually affected by human development. For the remaining 52 miles, one sees a natural river corridor with flowing blackwater shouldered by banks of floodplain forests.

Details of the river-corridor land use inventory are presented below. The study area is divided into seven sections beginning at the downstream end of the Lynches River County Park and moving down river. The listings of land use features within each section are presented sequentially, moving from upstream to downstream.

Section I: The Lynches River from the downstream end of Lynches River County Park to US 52. This section covers approximately two river miles. US 52 bridge, a paved ramp, and a railroad bridge affect about .1-mile. This is less than one percent of the proposed 54-mile corridor:

- US 52, paved ramp, and CSX Railroad bridge all clustered at mile # 2

Section II: The Lynches River from US 52 to Indigo Road access. On this 12-mile section, one highway-bridge, one power line, four houses, and 10 small landings affect the natural character and condition of the river corridor. The features listed below visually affect approximately 0.5 miles (approximately one percent) of the proposed corridor:

- One small landing on the east side of the river at mile # .5
- Small landing on each side of the river at approximately mile # 2.5
- One small landing on the east side of the river at approximately mile # 3.5
- Two small landings on the west side of the oxbow at mile # 4.5 (dry at time of survey)
- One small landing at end of ¼ mile (dry) canal on west side of river, mile # 6.5

- SR 49 bridge, a power line, two houses, 200 feet of riprap, 0.2 mile disturbed, mile #10
- Small landing (Anderson Bridge Landing) on the east side of the river at mile # 10.5
- House and small landing on west side of the river, 0.1 mile disturbed, at mile # 11.5
- Small landing at Indigo Road, mile # 12

Section III: The Lynches River from Indigo Road to Lee Landing. On this eight-mile section seven houses, seven small landings, two power lines, and one highway bridge affect the natural character and condition of the river corridor. The features listed below visually affect approximately 0.6 miles, (approximately one percent) of the proposed corridor:

- House and small landing on east side of river at mile # 0.1
- Three houses and a small landing on the west side of the river at mile # 1.25
- Power line crossing river at mile # 1.5
- Small landing on west side of river at mile # 3.25
- House and small landing on west side of river at mile # 3.75
- House and small landing on east side of river at mile # 4.5
- House and small landing on west side of river at mile # 5
- US 378 bridge, power line, and dirt landing (Wicklow Road) at mile # 6
- Lee Landing on west side of river at mile # 8

Section IV: The Lynches River from Lee Landing to Sandstone Road access. On this 7.5-mile section, three houses, one power line, and six small dirt landings affect the natural character and condition of the river corridor. There were two clear-cuts (0.5 mi. and 0.65 mi. in length) but a visual buffer was left intact at each. The features listed below visually affect approximately 0.5 mile, (approximately one percent) of the proposed corridor:

- Small dirt landing on east side at mile # 1
- Small dirt landing on east bank at mile # 2.25
- Three houses on east bank at mile # 2.5
- Power line crossing at mile # 4.25
- Small dirt landing, with short canal (Bennie Landing) on west side at mile # 5.5
- Two small dirt ramps (one with canal) on west side at mile # 6.75
- Small dirt ramp (Sandstone Road access) on east side at mile # 7.5

Section V: The Lynches River from Sandstone Road access to Bartell Landing. On this 8.5-mile section one highway bridge, one house, one paved ramp, and five small dirt landings affect the natural character and condition of the river corridor. There was a clear-cut (0.2 mi.) across from Sandstone Road access and a house on a bluff at mile # 5, but neither of these was noticeable from the river. The features listed below visually affect approximately 0.6 mile, (approximately one percent) of the proposed corridor:

- Small dirt landing (New Landing) on the south side at mile # 1.5
- Small dirt ramp (Pitch Landing) and small building on south side at mile # 2.5
- Bridge crossing (Hwy 49), paved ramp, and park (Half Moon), two houses and small landing at mile # 6
- Small landing and small building on south side at mile # 7
- Small dirt ramp (Bartell Landing) on north side at mile # 8.5

Section VI: The Lynches River from Bartell Landing to Venter's Landing. On this nine-mile

section one highway bridge, railroad bridge, two power lines, one pipeline, five houses, one paved ramp, and two small dirt ramps affect the natural character and condition of the river corridor. A house, buildings, and dirt ramp occur at the end of an oxbow lake (mile # 1) but they were not visible from the river. Most of the visual incursions are clustered at Highway 41/51 bridge. The features listed below visually affect approximately 0.5 mile, (approximately one percent) of the proposed corridor:

- House, buildings and dirt ramp (Glenn's Bluff) on south side at mile # 3
- Small dirt landing and small building on north side at mile # 4.5
- Power line crossing at mile # 8
- Pipe line crossing at mile # 8.5
- Twenty foot bluff with four houses on south side at mile # 8.75
- Hwy 41/51 bridge, railroad bridge, power line, and paved ramp (Venter's) at mile # 9

Section VII: The Lynches River from Venter's Landing to the Great Pee Dee River. Because of extremely low water flows, only a small portion of this section was actually floated. The first 1.25 miles consists of a beautiful "river-lake," after which the river braids into a number of channels and is impassable at low water levels. Most of the Lynches River water volume flows into Clarks Creek at mile # 7. The information on this section of the river is interpreted from aerial photos. This is a very remote section with little access. On this eight-mile section a water treatment plant, one power line, one house, and two small, dirt ramps affect the natural character and condition of the river corridor. Two clear-cuts are visually buffered from the river. One is at mile # 2 and another at mile # 6.5. The features listed below visually affect approximately 0.4 mile, (approximately percent) of the proposed corridor:

- A wastewater treatment plant occurs immediately below Venter's Landing at mile # .25
- Power line crossing at mile # 3
- House at mile # 3.75
- Dirt ramp at mile # 4
- Dirt ramp at mile #6.25

Land Ownership Patterns

Land bordering the Lynches River in Florence County is divided among 261 parcels, which altogether total 24,310 acres of land. The largest category of parcels (47 percent) is ten to 100 acres in size. Smaller parcels (10 acres or less) make up 29 percent of the total, while the largest parcels (greater than 200 acres) amount to 24 percent of the total parcels. Table 2 provides information on the distribution of river bordering land parcels by size categories. Seventy-three (73) percent of the total acreage is in parcels of 100 acres or greater. This factor results in the "wilderness appeal" of the Lynches River.

Table 2. Size Distribution of Land Parcels Contiguous with Lynches River.

Parcel Size Categories	Number of Parcels	Acreage of Parcels

1 to 10 acres	75 parcels	1,428 acres
>10 to 100 acres	122 parcels	5,242acres
>100 acres	63 parcels	17,640 acres
All Parcels (total)	261 parcels	24,310 acres

Scenic Rivers Classification

Land use conditions are the determining factor for how a river is classified within the State Scenic River Program. After a river is determined eligible, it must be classified according to the type that best fits each eligible river segment and may be classified as more than one river type along its length. Classification is based on the degree of naturalness and extent of development on the river and adjacent lands at the time of the study. The general descriptions for the three river classifications are as follows:

- *Natural rivers* are free flowing (without impoundment, diversion, or other modification to the waterway), generally inaccessible except by trail or river, with essentially undeveloped shorelines and unpolluted waters.
- *Scenic rivers* are essentially free flowing with largely undeveloped shorelines and limited road access; adjacent lands are used for dispersed human activities, such as agriculture, silviculture, and others which do not disturb the natural character of the river.
- *Recreational rivers* may have more access and development along the shoreline and should possess outstanding river-related recreational opportunities.

The entire 54-mile section of the Lynches River study area in Florence County is suited to the "scenic river" class because the shorelines of the river are largely undeveloped, the river corridor retains its natural character for nearly 96 percent of its length, and the river is free flowing. Yet, the river is accessible to the public at 14 different locations.

Scenic Characteristics

Methods for evaluating the scenic resources of rivers have been developed and applied in some areas of the country. These methods will typically consider the overall impression created by visual characteristics such as landforms, vegetative diversity, natural colors in the landscape, diversity of views, special features, and human effects. However, no such method has ever been applied to South Carolina's rivers.

The *South Carolina Rivers Assessment* provides comparative information on river scenery in assessment categories where scenic and aesthetic qualities were considered along with other resource values. Expert committees rated the Lynches River as either superior or outstanding for five resource categories that take into account scenic qualities of the river. The superior and outstanding values were for undeveloped river, flatwater boating, backcountry boating, recreational fishing, and inland fisheries.

The ways in which scenic values and visual aesthetic qualities of rivers were addressed in the *Rivers Assessment* are as follows. For recreational fishing, backcountry boating, and flatwater boating, a criterion called "scenic quality" was used to rank the rivers. Participants defined scenic quality by the type and diversity of landforms, vegetation, degree of naturalness, and presence of man-made features. Scenery and other aesthetic factors were part of the criterion. "Quality of Recreational Use" was used by the inland fisheries group. Other factors that could be related to the visual aesthetic character of rivers are the degree of naturalness, the quality and condition of habitats, and the scarcity of species and communities; the expert committees for natural features and undeveloped rivers assessed these.

As mentioned in the previous section on land use, human development activities have visually affected approximately two miles (roughly four percent) of the river within the study area. Approximately 52 river miles are visually free of human development and provide a setting where natural conditions surround the river users along most of this river's length.

Along most of its route the river is open, the channel typically ranging from six to 40 feet in width. Around the bends the views commonly extend 300 feet downriver, and in a few places they extend a quarter-mile or more. The river scenes are of clear blackwater, sandy river bottoms and bars, and winding water trails lined by cypress-tupelo swamps and bottomland hardwood forests. These visual elements make lasting impressions with the visitor.

Recreational Values

The recreational values of the river are assessed by considering the importance of existing and potential recreational uses such as boating, swimming, fishing, hunting, and camping. Other factors considered are river access facilities and proximity to population centers

Comparative information about the recreational resources of the state's rivers can be derived from the *South Carolina Rivers Assessment*. As explained previously, expert committees rated the Lynches River as a superior recreational resource for undeveloped river, flatwater boating and backcountry boating and it was rated an outstanding resource for recreational fishing and inland fishing.

Note: Mercury contamination in fish has become a public health issue of concern in recent years and the SCDHEC has issued a Fish Consumption Advisory for the entire Lynches River. This problem affects all the rivers in the Coastal Plain of South Carolina.

River access is available along the entire 54-mile study area at three paved boat ramps and 11 other dirt ramps, or drop-in sites, that are dispersed along the river's length. With the single exception of the last section (below Johnsonville), all of the river accessed from these sites is navigable by small canoes or kayaks. However, storm-downed trees and deadfalls may temporarily obstruct passage in some places. Access sites utilized by the public include the following:

1- Highway 52, double paved ramp
2- Anderson Bridge Landing off Hwy # 46 at Friendfield
3- Indigo Landing Road, throw-in
4- North (upstream) of Highway 378 (old 378-Wicklow Rd.) easy throw-in
5- Lee Landing Road, easy throw-in
6- Bennie Landing Road, easy throw-in
7- Sandstone Road access, dirt ramp
8- New Landing Road, easy throw-in
9- Pitch Landing Road, easy throw-in
10- Highway # 49 bridge, Half Moon Landing, paved ramp
11- Bartell Landing, dirt ramp
12- Glenn's Bluff Road, dirt ramp
13- Highway 51/41 bridge, Odell Venters Landing, paved ramp

14- Dirt road ramp off Persimmon Bluff Road

The Lynches is a popular river for canoeists with single-day float trips being the most common use.

Wherever access is available to the river, people will use the river for recreation: fishing, boating, and swimming. Many swimming holes are evident along the river where local residents enjoy the clean, cool blackwater of the Lynches.

The study area is within easy driving distance of several large population centers making the river's recreational resources accessible to many thousands of people. Florence, Myrtle Beach, and Georgetown are each within a one-hour drive of the river. Charleston, Columbia, Fayetteville, and Wilmington are within a two-hour drive.

Geological Resources

The geologic resources of interest on scenic rivers are features, processes, or phenomena that are considered unique or outstanding. These could include features of rare or unusual geologic composition or appearance, such as waterfalls, bluffs, unusual rock formations, or geomorphic features.

The Lynches River in Florence County features many oxbow lakes, sloughs, sand ridges, and other fluvial formations that have been created by the river within the floodplain. These type features are common to Coastal Plain rivers and many of these features can be seen from the main river channel.

The Lynches River flows through the flatlands of the Coastal Plain region of South Carolina. The relatively flat terrain, wide floodplains, and the sandy soils produce the swamplands and clear blackwater conditions that distinguish the river. The river corridor is underlain by thick layers of consolidated and unconsolidated sedimentary rocks that consist of alluvial sediments brought down from the Piedmont and marine sediments deposited when ocean and estuarine waters covered the region. Materials in these formations include sand, gravel, clay, and limestone.

Botanical Values

The botanical values of the river are assessed by considering the natural communities and species that exist within the river corridor. The presence of high quality natural communities, communities of special significance, and threatened or endangered species habitat are considered.

The vegetative communities of the Lynches River and adjacent land are typical of blackwater rivers and bordering swamplands in the Coastal Plain of South Carolina. The area has potential for supporting high quality examples of these communities. Botanical species of State Concern found along the Lynches include Georgia Leadplant (*Amorpha Georgiana var Georgiana*), Piedmont Three-Awned Grass (*Aristida condensata*), and Southeastern Tickseed (*Coreopsis gladiata*). The natural communities with high resource value include cypress-gum swamps,

bottomland hardwood forests, and fluvial sand ridge communities. The dominant overstory trees along the river's edge, in oxbow lakes and sloughs, and throughout the adjacent swamps are baldcypress and tupelo. Other common overstory species along the river include red maple, sycamore, sweetgum, black gum, overcup oak, water oak, laurel oak, water hickory, American holly, and green ash. The loblolly pine occurs on some of the higher banks and along sand ridges found within the river's floodplain. Understory vegetation along the river's edge is dominated by river birch which overhangs the water in many areas. Black willow is a common understory species along exposed sandbars. Herbaceous aquatic macrophytes are common in shallow, slow-flowing habitats along the entire river segment.

Fish and Wildlife Values

Fish and wildlife values are assessed by considering the occurrence of habitats and populations in the river corridor. Habitats of special significance for both game and nongame species, habitats for threatened or endangered species, and the abundance and diversity of habitats and species are considered.

Fisheries

The Lynches study area was rated by expert committees of the *South Carolina Rivers Assessment* as an outstanding resource for recreational fishing and inland fisheries. The Lynches River and associated tributary streams, sloughs, oxbow lakes, and swamps provide a diverse habitat for the indigenous fish community. The river's relatively stable streamflow and good water quality further contribute to a favorable environment for fish.

The Lynches River corridor provides a unique blend of high quality Coastal Plain, Piedmont and Sandhills habitats that lend to its high diversity of fish species. Fifty-four species were collected in the Lynches River during a three-year study (Crochet and Black, 2000). With inclusion of tributary streams, a total of 78 species occurs within the Lynches River drainage (F. Rodhe, pers. comm.). Ten species are designated as either "High" or "Highest" Priority in the South Carolina Comprehensive Wildlife Conservation Strategy (CWCS; Kohlsaat et al., 2005). The high quality habitat within the designated reach of the Lynches River supports three species of diadromous fishes which migrate between freshwater and saltwater habitats. Additionally, several other species are undocumented in the Lynches, but confirmed from the Great Pee Dee River near its confluence with the Lynches (F. Rodhe, pers. comm.). For example, the shortnose sturgeon, a Federally Endangered species that inhabits coastal rivers of South Carolina, is expected to occur, as well as Atlantic sturgeon and hickory shad, both "of state concern" (Kohlsaat et al., 2005).

The high quality and relatively unimpacted watershed support several notable fish faunal elements. It harbors one of the best populations of the undescribed "thinlip" chub (*Cyprinella spp*), which is rare and restricted to a half dozen streams in the Carolinas. The equally or more rare "broadtail" madtom (*Noturus spp*), also undescribed, occurs in the Lynches River drainage (W. Starnes, pers. comm.). Further, the Lynches supports at least two faunal elements that are otherwise known only from the Wateree/Catawba River basin, the greenfin shiner (*Notropis chloristia*) and greenhead shiners (*N. chlorocephalus*; W. Starmes, pers. comm.). These do not occur in the remainder of the Pee Dee River basin (but are represented by congeners). Their

occurrence in the Lynches is indicative of an oddity in the biogeographic history and thus is of scientific interest (W. Starnes, pers. comm.).

The Lynches River also provides a distinctive recreational angling experience due to its high quality fish habitat such as forested riparian zones, undercut streambanks, large woody debris, and the lack of impoundments. Upon the recommendation of the existing Lynches Scenic River Management Plan, a three-year fisheries survey was conducted on the Lynches River from 1997 to 2000 consisting of a creel survey, comprehensive electrofishing, and specific investigation to assess the abundance and impact of non-native, invasive flathead catfish (Crochet and Black, 2000). Results of a creel survey indicated that estimated recreational angling effort ranged from 18,674 hours to 27,972 hours per year. The majority of fishing pressure occurred during spring and early summer (April – June) and was evenly distributed between bank and boat anglers. Of the 14 species harvested by anglers, redbreast sunfish (*Lepomis auritus)* and bluegill (*Lepomis macrochirus*) were the most abundant. Channel catfish (*Ictalurus punctatus*) and largemouth bass (*Micropterus salmoides*) were not as numerically abundant, but comprised an important portion of the harvest. Flathead catfish (*Pylodictis olivaris*) were not detected during the creel survey.

Studies within southern coastal rivers involving flathead catfish effects on native species demonstrate negative effects on many species in the Lynches River, including those of recreational importance such as bluegill and redbreast sunfish. The majority of flathead catfish were collected between US Hwy 401 and the confluence with the Great Pee Dee River (Crochet and Black, 2000). However, tests to determine negative impacts of flathead catfish on native species in the Lynches River, specifically sunfishes, were inconclusive. Five species occurred in significantly lower numbers in the areas of the Lynches River inundated with flathead catfish including: fieryblack shiner (*Cyprinella pyrrhomelas*), redbreast sunfish, silver redhorse (*Moxostoma anusirum*), brassy jumprock (*Scartomyzon brassia*), and whitefin shiner, (*Cyprinella nivea*). It could be proposed that the differences in species abundance could be a result of geophysical effects within the river continuum. However, three sunfish species (bluegill, redear sunfish, and spotted sunfish, *Lepomis punctatus*) occurred in greater numbers in areas with flathead catfish populations (Crochet and Black, 2000). The reasons for this are unclear but it may be due to decreased competition for forage or habitat with the other affected species.

South Carolina Department of Health and Environmental Control (SC DHEC) has recorded elevated mercury levels in fish collected from the Lynches River. Mercury contamination in fish is a common problem in waterbodies in South Carolina and across the eastern U.S. Mercury in the environment is linked to fossil fuel and industrial emissions, which, when released into the air, settle into waterbodies where they may become incorporated into fish tissue. Mercury then works its way up the food chain as large fish consume contaminated smaller fish. It is therefore most concentrated in large predatory fish, such as largemouth bass, bowfin (*Amia calva*), and catfish. Currently, fish tissues from the Lynches River downstream of U.S. Hwy 15 contains mercury (SC DHEC, 2007). Fish tissues upstream of U.S. Hwy 15 are not currently tested, so the presence of mercury is unclear. South Carolina fishes are tested for mercury every year and consumption advisories are released on an annual basis by SC DHEC.

Wildlife

The Lynches River floodplain in Florence County is roughly a half (0.5) mile in width and 54 miles in length. This area contains large acreages of wild and undeveloped forestland, wetlands, and open water that provide suitable habitat for a variety of wildlife species. Beyond the floodplain, the surrounding uplands support additional wildlife habitat in a landscape of agricultural fields and upland forests.

Most property adjacent to the river is in large blocks of ownership with 63 parcels of land that equal or exceed 100 acres in size. Larger parcels usually result in less fragmentation of wildlife habitat. Five highway crossings contribute to habitat fragmentation by cutting through the wide floodplain forest corridor. However, these roads are two-lane rural highways that are narrower with less traffic, and therefore have less impact on wildlife.

The expert committees of the *South Carolina Rivers Assessment* rated the Lynches study area a superior resource for undeveloped rivers, a positive aspect for wildlife. Padlers have a good chance of observing river otters, white-tailed deer, grey squirrels, foxes, great blue herons, bald eagles, osprey, bats, and various songbirds. Wood ducks inhabit the area year-round and American Black Duck, Mallard, Green-winged Teal, Ring-necked Duck, and Hooded Merganzer are winter residents. Bird species that can be observed here include the American woodcock (winter), Swainson's warbler, wood thrush, white-throated sparrow (winter), Kentucky warbler, prothonotary warbler, worm-eating warbler, and yellow-billed cuckoo, and possibly the swallow-tailed kite. The avian species listed here are "area sensitive species" that are in decline due to loss of habitat. Bat species that occur here include: Seminole bats, southeastern myotis, big brown bats, and eastern pipistrelles. Turtles, lizards, snakes, and salamanders can also be observed along the Lynches River.

The border of the Lynches Scenic River Trail includes occurrences of the Federally Endangered Red-Cockaded Woodpecker (*Picoides borealis*) and the State Threatened Spotted Turtle (*Clemmys guttata*). State Concern species that occur here include the Pickerel Frog (Rana palustris), Eastern Fox Squirrel (*Sciurus niger*), River Horn Snail (*Elimia catenaria*), Georgia Leadplant (*Amorpha Georgiana var Georgiana*), Piedmont Three-Awned Grass (*Aristida condensata*), and Southeastern Tickseed (*Coreopsis gladiata*).

Historic and Cultural Values

The historic and cultural values of a river are assessed by considering the importance of historic and prehistoric events, uses, structures, and artifacts related to the river corridor. The expert committees of the *South Carolina Rivers Assessment* of 1988 did not rate the Lynches River for historic and cultural values and the river is not noted for any outstanding archaeological discoveries; nevertheless, like most rivers of the South Carolina Coastal Plain, the Lynches is a natural resource that has supported human settlements for thousands of years and to this day continues to be valued by the surrounding communities.

The following paragraphs offer some information describing the progression of settlement in the area and the transportation developments on and over the Lynches River through time.

People have inhabited the Lynches River and surrounding landscape since the end of the last

ice age, more than 12,000 years ago. These inhabitants include the earliest people in North America, Paleoindians, countless Native American Archaic and Woodland hunters and gatherers, foragers and collectors, late prehistoric farmers, colonizing European and African traders, prospectors, slaves and slavers, plantation owners, merchants and farmers of the 17th, 18th, 19th and 20th Centuries and all left evidence of their passing. While the 30 odd archaeological sites recorded with the South Carolina Institute of Archaeology and Anthropology in and along the banks of the Lynches between Lee State Park and its confluence with the Great Pee Dee River do not document the entirety of the cultural resources to be found along river, they offer us a glimpse the river's past draw to people.

We will never know the names of the river's earliest inhabitants but their presence is recorded by the tools they discarded. Countless stone tools and pottery fragments document the presence of Native Americans along the Lynches River. These people undoubtedly utilized the river for travel, resource procurement, and recreation and the same reasons characterize our interest in its dark waters today. Early Native Americans made their living from the landscape in various ways, and for nearly 10,000 years some form of hunting and gathering characterized their lifestyle. While evidence of horticulture can be dated to perhaps 3,000 years ago, even these early farmers weren't settled in one permanent place. We do know that in the early historic period the Catawba, Santee, Wateree, Waxhaw, Congaree, Peedee, Cape Fear, Waccamaw, Winyah, Eno, Keyauwee, Shakori, Sissipaw, and Sugeree were inhabitants of central and northern South Carolina and likely passed along the Lynches at some point.

The most recent human colonization began in the 16th Century with the founding of Spanish Santa Elena, French Charles Fort, and finally with the permanent settlement of Charles Towne in 1670. Throughout the late 15th and early 16th Centuries trade with Indians made up the majority of the European and African presence throughout central South Carolina. Beginning in the early 18th Century settlers began moving into the Welsh Neck between the Great and Little Pee Dee Rivers and, as the landscape became filled, subsequent settlers moved into the Lynches River drainage. The 1715-16 Yemmassee War killed those Indians who had survived the onslought of European disease or forced them to merge with the Catawba in modern York and Lancaster counties. From the 1755 Mouzon map *An Accurate Map of North and South Carolina*, people named Witherspoon, Wraggs, Keith, Brown, McKeithy, Corkfield, Summons, Pursley, Hurst, Polays, Chandler, Mires, Wards, Andrews, Wiler, Palyers, Sparrow, Raburn, Godsen, Warren, Debuskes, Roose, and Carrier had positioned themselves along the Lynches in the George Town and Cheraw districts.

During the American Revolution, the area around the Pee Dee Region contained many persons who were loyal to the King, and it became the scene for much of the activity of General Francis Marion, the Swamp Fox, who among others successfully prolonged the war with the British to enable victory for the American colonies. Marion's base of operations was Snow Island at the confluence of the Great Pee Dee and Lynches Rivers.

Streamflow and Water Quality

To assess streamflow, issues of minimum flow, navigation, and natural stream conditions are considered. Streamflow conditions should include a sufficient volume of water during normal years to permit traditional instream uses. The volume of water should be sufficient for safe

navigation where navigational use is important. To assess water quality, the river's water classification, water quality trends, and related water quality problems are considered. The water quality in scenic rivers should meet or exceed the relevant state water quality standards.

Streamflow

The Lynches River is free flowing (not dammed) and the natural, physical characteristics of the river appear to be unaltered by channelization projects. Average daily streamflow, measured on the river at Effingham, is about 777 cubic feet per second (cfs) and the streamflow can be expected to equal or exceed 338 cfs 80 percent of the time. The Lynches is a blackwater river, stained a dark tea color by chemicals known as tannins, which are leached from decompsing leaves and wood in the surrounding swamps. It should be noted that the all-time minimum flow (173 cfs in 2002) has been exceeded during the current drought conditions. The flow went as low as 136 cfs in November 2007. Exceedingly low flows have occured during most of this study.

This river system flows through the Piedmont of North and South Carolina, the Carolina sandhills, and the sandy, permeable soils of the Coastal Plain. The porous soils of the Coastal Plain store large amounts of water and during periods of low rainfall the shallow aquifers discharge groundwater to the streams and supplement the river's flow. This groundwater discharge to the streams is reduced during the summer and early fall when high temperatures result in substantial losses of water from the basin through evaporation and transpiration by plants. For the first time, drought-reduced water table levels have resulted in water flowing from the river into the water table in some instances.

Water Quality

The watershed of the Lynches River encompasses approximately 1,400 square miles and extends from the Piedmont, through the Sandhills, and into the Coastal Plain. Because of its Piedmont origins, the Lynches River in higher flow conditions may appear as a brown-water river as the currents suspend the finer clay sediments of the Piedmont and may cause the river to have a muddy appearance. However, the lower Lynches River is within the Coastal Plain and will most often exhibit the characteristics of a blackwater river with the dark tea-colored waters stained by tannins that are leached from organic material decomposing in the surrounding swamps. The watershed of the lower Lynches has natural characteristics of permeable soils and extensive swamplands that tend to filter pollutants and protect water quality in the river from human pollution sources. The swamps, however, can cause natural water quality problems with low levels of pH and dissolved oxygen.

The South Carolina Department of Health and Environmental Control (SCDHEC) conducts routine water quality monitoring at stream locations (stations) throughout South Carolina, including the Lynches River system. For each station, SCDHEC analyzes the monitored data to assess water quality conditions and changes. SCDHEC will report findings on water quality using the terms "aquatic life support" and "recreational use support," which reference goals of the Federal Clean Water Act and South Carolina state water-quality standards. When SCDHEC finds a station that does not support recreational uses or does not support aquatic life uses then that location is placed on a state list of impaired waters (the "303(d) list" (SCDHEC, 2006)) and

becomes the target of additional study and restoration efforts. Terms used by SCDHEC are described as follows:

- Aquatic life use support is determined based on the percentage of excursions of certain criteria and, where data are available, the composition and functional integrity of the biological community. Among the parameters assessed are: dissolved oxygen, pH, toxicants (priority pollutants, heavy metals, chlorine, ammonia), nutrients, and turbidity.
- Recreational use support, the degree to which the swimmable goal of the Clean Water Act is attained, is based on the frequency of fecal coliform bacteria excursions. Standards for primary contact recreation were derived from public health data that estimate the potential risks to humans of contracting waterborne illnesses after swimming due to exposure to sewage-related pathogens (SCDHEC, 2000).

For the lower Lynches River study area, the SCDHEC analyses of water quality monitoring data indicate that the river has acceptable water quality conditions, with certain exceptions. Two water-quality monitoring stations are located in the study area on the lower Lynches River: (1) an upper station at U.S. Highway 52 crossing, and (2) a lower station at State Road 49 crossing. SCDHEC (2000 and 2007) reports that recreational uses are fully supported at both of these monitoring stations, meaning that bacteria concentrations appear safe for swimming and similar water-contact recreation. Aquatic life uses are fully supported at the upper station but not at the lower station because copper levels found at the lower station exceed the criterion for protection of aquatic life. SCDHEC reports pH excursions at both stations but considers the lower pH conditions as natural for blackwater ecosystems, and not a violation of the standards for water quality.

SCDHEC analyses of trends in the monitoring data show favorable changes in the river's water quality over time. At both the upper and lower stations the changes in biochemical oxygen demand and nutrient concentrations suggest improving conditions for these pollutants; and the lower station also shows improving conditions for turbidity.

Upstream of the study area on the Lynches and in the major tributaries of the study area both favorable and unfavorable water quality conditions occur. On the Lynches River at State Road 55 crossing, above Lynches River County Park, recreational uses are supported but aquatic life uses are not supported in the river because of low pH and decreasing trends for pH. At the lower end of Sparrow Swamp, near State Road 55, both recreational uses and aquatic life uses are supported in the swamp. On the lower end of Big Swamp, at U.S. Highway 378 crossing, recreational uses are not supported because of bacterial contamination; however, aquatic life uses are now fully supported, reflecting a positive change in dissolved oxygen from an impaired condition found in 2000 (SCDHEC, 2000 and 2007). At the lower end of Lake Swamp, near Johnsonville at S.C. Highway 341 crossing, both recreational uses and aquatic life uses are fully supported in waters of the swamp; and though dissolved oxygen excursions have occurred, they were typical of values seen in blackwater systems and were considered natural, not standards violations (SCDHEC, 2007).

Four facilities are permitted by SCDHEC (with NPDES permits) to discharge wastewater into the lower Lynches River. These facilities include (1) McCall Farms, Inc., which discharges at U.S. Highway 52 crossing; (2) Lake City/Lake Swamp wastewater treatment plant, which discharges across the river from Hannah; (3) Wellman Inc., and (4) the City of Johnsonville,

both of which discharge at Johnsonville. In the tributaries to the lower Lynches study area there are only two permitted wastewater discharges: (1) the Town of Timmonsville in Sparrow Swamp, and (2) the Town of Pamlico in Big Swamp, (SCDHEC, 2000).

Mercury has contaminated fish in the Lynches River. The major known sources of this mercury contamination are reported to be air emissions from the burning of coal and other fossil fuels and the incineration of wastes. Mercury enters the water from the atmosphere, settles to the bottom of a stream, and there it can be changed to an organic form, methylmercury, which small fish and other aquatic life can absorb from the water and sediment. The mercury accumulates in fish tissue and becomes concentrated in the food chain. Larger predator species of fish, such as bass, are more likely to have high levels of mercury. A fish consumption advisory for mercury has been issued by SCDHEC for the Lynches River advising people to limit the amount of some types of fish consumed from these waters. The advisory states:

- Do not eat any channel catfish or bowfin (mudfish).
- Limit to one meal per week of redear sunfish.
- Limit to one meal per month of largemouth bass or chain pickerel.
- No restriction on bluegill or redbreast sunfish.

Pregnant women, women planning to become pregnant, infants, and children should not eat any fish containing mercury. Infants and children are particularly sensitive to the effects of mercury since their nervous systems are still forming. For additional information and the most current advisories, visit the SCDHEC, Fish Advisories homepage at - http://www.scdhec.net/environment/water/fish/index.htm - or call SCDHEC's Bureau of Water at (803) 898-4300 (SCDHEC, 2007b).

Conclusions about the River's Eligibility

Findings from this eligibility study demonstrate that the 54-mile Lynches River study area does possess outstanding river-related values and the river merits designation as a State Scenic River. Those values judged to be of outstanding significance include the river's scenic, recreational, fish, and wildlife values.

The Lynches is a unique blackwater river and provides outstanding scenery with clear, dark waters, sandy river bottoms and bars, and winding water trails lined by cypress-tupelo swamps and bottomland hardwood forests. Approximately 96 percent of the river is visually free of human development.

The natural resources of the Lynches River provide outstanding recreational fishing and boating opportunities and many other nature-based recreational pursuits. The area is within easy driving distance of several large population centers, making the river's recreational opportunities accessible to thousands of people.

The Lynches River floodplain and adjacent uplands contain large acreages of wild and undeveloped forestland, wetlands, and open waters that provide excellent habitat for a great variety of wildlife species. The adjacent uplands contain additional wildlife habitat in a landscape of agricultural fields and upland forests. The natural ecological communities with high resource value include cypress-gum swamps, bottomland hardwood forests, and fluvial sand ridge communities. This free flowing, unaltered river system is an outstanding resource for inland fisheries with its streams, sloughs, oxbow lakes, and swamps providing diverse habitat for the indigenous fish community of both resident and migratory species.

SCDNR staff recommends that the 54-mile section of the Lynches River in Florence County be designated as a State Scenic River from the downstream end of Lynches River County Park to the confluence with the Great Pee Dee River. For purposes of river classification, the entire 54-mile section of the Lynches study area in Florence County is suited to the "scenic river" class. The river is accessible from 14 public access sites (includes five road crossings) and at dozens of private areas; however, the shorelines of the river are largely undeveloped, the river corridor retains its natural character for nearly 96 percent of its length, and the river is free flowing.

Appendix 1

Fishes of the Lynches River. An asterisk (*) indicates that it is currently undocumented but has been confirmed from the Great Pee Dee River near its confluence with the Lynches River. Conservation designation: Federal=Endangered, State=Endangered

Common Name	Scientific name	CWCS Priority	Conservation Designation
American eel	*Anguilla rostrata*	Highest	
American shad	*Alosa sapidissima*	Highest	
Atlantic needlefish*	*Strongylura marina*		
Atlantic sturgeon *	*Acipenser oxyrhynchus*	Highest	Of Concern
Banded pygmy sunfish	*Elassoma zonatum*		
Banded sunfish	*Enneacanthus obesus*		
Bigmouth buffalo*	*Ictiobus cyprinellus*		
Black crappie	*Pomoxis nigromaculatus*		
Blackbanded sunfish	*Enneacanthus chaetodon*	High	
Blue catfish	*Ictalurus furcatus*		
Blueback herring	*Alosa aestivalis*	Highest	Of Concern
Bluegill	*Lepomis macrochirus*		
Bluehead chub	*Nocomis leptocephalus*		
Bluespotted sunfish	*Enneacanthus gloriosus*		
Bowfin	*Amia calva*		
Brassy jumprock	*Scartomyzon brassia*		
Broadtail madtom	*Noturus spp.*	Highest	State Threatened
Brook silverside	*Labidesthes sicculus*		
Brown bullhead	*Ameiurus nebulosus*		
Chain pickerel	*Esox niger*		
Channel catfish	*Ictalurus punctatus*		
Coastal shiner	*Notropis petersoni*		
Common carp	*Cyprinus carpio*		
Creek chub	*Semotilus atromaculatus*		
Creek chubsucker	*Erimyzon oblongus*		
Dollar sunfish	*Lepomis marginatus*		
Dusky shiner	*Notropis cummingsae*		
Eastern mosquitofish	*Gambusia affinis*		
Eastern mudminnow	*Umbra pygmaea*		
Eastern silvery minnow	*Hybognathus regius*		
Everglades pygmy sunfish	*Elassoma evergladei*		
Fieryblack shiner	*Cyprinella pyrrhomelas*	Moderate	
Flat bullhead	*Ameiurus platycephalus*	Moderate	
Flathead catfish	*Pylodictis olivaris*		
Flier	*Centrarchus macropterus*		
Gizzard shad	*Dorosoma cepedianum*		

Golden shiner	*Notemigonus crysoleucas*		
Grass carp	*Ctenopharyngodon idella*		
Green sunfish	*Lepomis cyanellus*		
Greenfin shiner	*Cyprinella chloristius*	High	
Greenhead shiner	*Notropis chlorocephalus*	Highest	Of Concern
Hickory shad *	*Alosa mediocris*	Highest	Of Concern
Highfin shiner	*Notropis altipinnis*		
Hogchoker	*Trinectes maculatus*		
Ironcolor shiner	*Notropis chalybaeus*		
Lake chubsucker	*Erymyzon sucetta*		
Largemouth bass	*Micropterus salmoides*		
Least killifish	*Heterandria formosa*		
Lined topminnow	*Fundulus lineolatus*		
Longnose gar	*Lepisosteus osseus*		
Lowland shiner		Moderate	
Margined madtom	*Noturus insignis*		
Mud sunfish	*Acantharchus pomotis*	Moderate	
Notchlip redhorse			
Piedmont darter	*Percina crassa*	High	
Pirate perch	*Aphredoderus sayanus*		
Pumpkinseed	*Lepomis gibbosus*		
Quillback*	*Carpiodes cyprinus*	Highest	
Redbreast sunfish	*Lepomis auritus*		
Redear sunfish	*Lepomis microlophus*		
Redfin pickerel	*Esox americanus*		
Rosyside dace	*Clinostomus funduloides*		
Sandbar shiner	*Notropis scepticus*		
Sandhills chub	*Semotilus lumbee*	Highest	Of Concern
Satinfin shiner*	*Cyprinella analostana*		
Sawcheek darter	*Etheostoma serriferum*		
Sea lamprey *	*Petromyzon marinus*		
Shorthead redhorse	*Moxostoma macrolepidotum*		
Shortnose sturgeon *	*Acipenser brevirostrum*	Highest	Federal & State
Smallmouth buffalo*	*Ictiobus bubalus*		
Snail bullhead	*Ameiurus brunneus*	Moderate	
Spottail shiner *	*Notropis hudsonius*		
Spotted sucker	*Minytrema melanops*		
Spotted sunfish	*Lepomis punctatus*		
Striped bass*	*Morone saxatilis*		
Striped mullet	*Mugil cephalus*		
Swallowtail shiner	*Notropis procne*		
Swamp darter	*Etheostoma fusiforme*		
Swampfish	*Chologaster cornuta*		
Tadpole madtom	*Noturus gyrinus*		
Taillight shiner	*Notropis maculatus*		
Tessellated darter	*Etheostoma olmstedi*		

Thinlip chub		Highest	
Threadfin shad	*Dorosoma petenense*		
Warmouth	*Lepomis gulosus*		
White bass *	*Morone chrysops*		
White catfish	*Ameiurus catus*		
White perch*	*Morone americana*		
Whitefin shiner	*Cyprinella nivea*		
Yellow bullhead	*Ameiurus natalis*		
Yellow perch	*Perca flavescens*		

Appendix 2

Answers to Common Questions about State Scenic Rivers

How will scenic river designation affect property owners? Are there regulations or restrictions associated with the designation? Will there be restricted use of the river?

The Scenic Rivers Program is conducted in a manner that respects private property rights. No state regulations are imposed on property owners and no one is obligated to participate in the program. The program works through a voluntary, cooperative management approach where river-management objectives are determined by a Scenic River Advisory Council, a group representing local landowners and local river users. To further protect private property owners, the "South Carolina Scenic Rivers Act" prohibits the use of eminent domain or condemnation of private property through this program.

The Scenic River advisory council will create a management plan to define the long-term management needs of the river and to set goals and objectives for addressing those needs. The management plan is created and implemented by involving any interested citizen who wishes to participate. After studying a particular problem, it is possible the advisory council may conclude that a form of regulation is needed to better manage the river in some way, and they may try to establish a regulation. However, the advisory councils have no power to create regulations themselves. Like any other interest group, they have to go through county councils or the General Assembly or some other governing authority to get a regulation passed.

Because most members are local landowners, the Scenic River advisory councils usually advocate nonregulatory solutions to river problems. The groups usually accomplish their objectives through voluntary management agreements with landowners, cooperative river-improvement projects, and education activities.

How are members of the Advisory Councils appointed? Who determines their direction and what they will do?

Scenic River advisory councils are appointed by the Executive Director of the SCDNR and they are chaired by a staff member from the SCDNR Scenic Rivers Program. Nominations for members are solicited from the local landowners and citizens. Additional people, beyond the official members, are encouraged to be involved in the work of the advisory council and they can be appointed as *ex-officio* (non-voting) members.

A Scenic River advisory council is a committee composed of six to ten voting members who represent landowners and community groups with an interest in the river. By law, the majority of voting members must be river-bordering landowners. The advisory council determines the overall direction of activity for a scenic river project. Decisions and courses of action are usually based on a consensus, or full agreement, among the whole group.

All meetings of the Advisory Councils are open to visitors who are welcome to provide

input to Advisory Council decisions. Participation of *ex-officio* (non-voting) members is encouraged on the Advisory Councils.

What is the advantage of the scenic river designation?

The primary advantage of scenic river designation is the creation of a partnership between local citizens and the SCDNR to conserve and enhance the scenic river. The SCDNR forms a commitment (advisory council) to work cooperatively with local people and local governments to take a long-term, comprehensive view of the resource and try managing changes in a way that conserve the natural and scenic qualities of the river for the enjoyment of present and future generations.

The scenic river designation brings recognition to the river through the action of the South Carolina General Assembly and through ongoing actions of the local advisory council as they bring attention to the river and the projects they undertake to better protect and manage the river.

The local advisory council and SCDNR staff work together to develop a community vision for the river. Through a citizen-based planning process they produce a management plan with goals and strategies for protecting and enhancing the river.

The Scenic Rivers Program can provide protection for natural and cultural features through conservation easements that also provide tax advantages for property owners.

References

Crochet, Daniel W., and W. Patrick Black. 2000. Fisheries Investigations in Lake and Streams: District VII Annual Report, July 1, 1997 to June 30, 2000. SC Dept. of Natural Resources. Division of Wildlife and Freshwater Fisheries, Columbia, SC

Kohlsaat, Thomas, Lynn Quatro and Jennifer Rinehart. 2005. South Carolina Comprehensive Wildlife Conservation Strategy: 2005-2010. SC Dept. of Natural Resources, Columbia, SC.

SCDHEC Staff. 2007a. Information obtained from staff at the South Carolina Department of Health and Environmental Control, Bureau of Water, Columbia, South Carolina.

SCDHEC. 2007b. Information obtained from the Fish Advisories website of the South Carolina Department of Health and Environmental Control, Bureau of Water, Columbia, South Carolina. Internet: http://www.scdhec.net/environment/water/fish/index.htm

SC DHEC. 2007. South Carolina Fish Consumption Advisories. SC Dept. of Health and Environmental Control, Columbia, SC

SCDHEC. 2006. *State of South Carolina Integrated Report Part I: Listing of Impaired Waters*. South Carolina Department of Health and Environmental Control, Bureau of Water, Columbia, South Carolina. Internet: http://www.scdhec.gov/environment/water/docs/06_303d.pdf

SCDHEC. 2000. *Watershed Water Quality Assessment: Pee Dee Basin*. Technical report 015-00, 2nd edition. South Carolina Department of Health and Environmental Control, Bureau of Water, Columbia, South Carolina. Accessible on the Internet from: http://www.scdhec.net/environment/water/shed/

SCWRC. 1988. *South Carolina Rivers Assessment*. South Carolina Water Resources Commission Report No. 164. SCWRC is now the Land, Water, and Conservation Division of the South Carolina Department of Natural Resources, Columbia, South Carolina.

.